MATEMATIKA

6

O‘QITUVCHILAR UCHUN
METODIK QO‘LLANMA

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SO‘ZBOSHI

Muhtaram ustozlar!

Keyingi davrda malakali mutaxassislarga ehtiyoj tobora ortib bormoqda. Hozirgi zamon yangicha tafakkurga ega bo‘lgan, dunyoga yangicha ko‘z bilan qaraydigan, yangicha fikrlaydigan yangi avlodni taqozo etmoqda. Bunday avlod qanchalik tez tayyorlansa, mamlakatimizning iqtisodiy salohiyati shunchalik tez yuksaladi. Bu o‘rinda yoshlarning matematik tayyorgarligiga qo‘yiladigan talablar ham juda muhim masala hisoblanadi.

Matematika fani bo‘yicha Milliy o‘quv dasturida belgilangan yangi davlat ta’lim standartlari va o‘quv dasturi matematika ta’limini sifat va mazmun jihatidan yangi darajaga ko‘tarishni vazifa qilib qo‘ydi.

Shu vazifani amalga oshirish maqsadida 6-sinf “Matematika” darsligi va o‘qituvchilar uchun mo‘ljallangan uslubiy qo‘llanma yaratildi. Darslikda keltirilgan mavzular sodda, tushunarli tilda, hayotiy masalalar yordamida qisqacha yoritilgan va rasmlar bilan bezatilgan. Mashg‘ulotlar har bir mavzu bo‘yicha turli xil kichik savollar, testlar, amaliy mashqlar, topshiriqlardan tashkil topgan bo‘lib, ular bir-biri bilan uzviy bog‘liq va o‘quvchidan ijodiy yondashuvni talab qiladi. Darslik asosida dars olib borish yo‘l-yo‘riqlari uslubiy qo‘llanmada keltirilgan.

Darslikni yaratishda rivojlangan mamlakatlarda to‘plangan ilg‘or tajriba namunalaridan ham foydalanilgan. Shu bilan birga, yurtimizga xos sharqona qadriyatlarimizga darslikda katta e’tibor berilgan. Darslik asosan o‘quvchiga qaratilgan bo‘lib, uning imkoniyatlarini, yoshini, individualligini, mustaqil fikrlovchi, o‘z qarash va tushunchalariga ega bo‘lgan erkin shaxs ekanini hisobga olgan holda yozilgan. Bu darslik asosida o‘qituvchi darsda, mashg‘ulotlarda o‘quvchining faol ishtirokini ta’minlashi, o‘quvchiga qaratilgan o‘quv uslublarini (interfaol usullar) keng qo‘llashi, joriy qilishi mumkin. Mavzular hayot va turmush bilan bog‘liq holda konkret masalalar, amaliy topshiriqlar bilan boyitilgan va o‘quvchilarning darsda va darsdan keyin ham o‘quv jarayonining faol ishtirokchisiga aylanishiga xizmat qiladi. O‘rni kelganda o‘quvchilarga bu fanning abstrakt, tushunarsiz, qiyin fan emasligini, balki u insonlarning ehtiyojlari, sivilizatsiya sababli paydo bo‘lgani va insoniyatga xizmat qilib kelayotgani haqida, qolaversa, bu fanning rivojiga buyuk vatandoshlarimizning qo‘shgan bebaho, ulkan hissalari to‘g‘risida zarur tushuncha va ma’lumotlar berilgan.

Darslikda 8 ta shartli belgi keltirilgan:



– bu belgi “Yangi ma’lumotlar” deb nomlanadi. O‘qituvchi tomonidan yangi mavzu bo‘yicha yangi ma’lumot beriladi.



– bu belgi ostida o‘quvchilarda hayotiy ko‘nikmalarni rivojlantirish, ya’ni turli vaziyatlarda yuzaga keladigan muammolarni mustaqil hal etishga qaratilgan topshiriqlar keltirilgan. Ular yozma ravishda bajariladi.



– bu belgi ostidagi topshiriqlar o‘qituvchi va o‘quvchilar tomonidan birga bajariladi. Bunda o‘qituvchiga ijodiy ishlash uchun imkoniyat yaratiladi, ya’ni bunday topshiriqlar turli o‘yinlar, tarqatma materiallar, metodlardan foydalangan holda bajariladi.



– “Eslaymiz” belgisi bilan oldingi sinflar yoki mavzularda o‘tilgan mavzularni eslatish maqsad qilingan. Ya’ni yangi mavzuni boshlashdan oldin shu mavzu uchun kerak bo‘ladigan ma’lumotlar eslatiladi.

 – “Qiziqarli matematika” belgisi yordamida o‘tilgan mavzular bo‘yicha bilimlarni mustahkamlash uchun nostandart, mantiqiy topshiriqlardan namunalar keltirilgan.

 – murakkablik darajasi yuqori bo‘lgan topshiriqlar. Bu topshiriqlardan sinfdan tashqari mashg‘ulotlarda, fan olimpiadasiga tayyorlashda foydalanish mumkin.

 – bu belgi ostidagi topshiriqlar o‘quvchilar tomonidan amaliy bajariladi. O‘quvchi o‘zi chizadi, yasaydi, qirqadi, bo‘yaydi, yelimlaydi. Bajarilgan ish taqdimot qilinadi, o‘qituvchi hamda tengdoshlari tomonidan rag‘batlantiriladi.

 – uyga beriladigan topshiriq mazmuni o‘qituvchi tomonidan tushuntiriladi, yo‘llanma, ko‘rsatma beriladi.

 – o‘quvchilarning ma’lumotlarni yodda saqlashi, e‘tibor berishi nazarda tutiladi.

Metodik qo‘llanmada dars maqsadini 6-sinf o‘quvchilariga matematika fanidan qo‘yilgan talablardan kelib chiqib belgiladik. O‘qituvchilar dars so‘ngida belgilangan maqsadga erishishlari kerak.

Qo‘llanma so‘ngida darslikning “Qo‘shimcha topshiriqlar” bo‘limidan olingan topshiriqlardan namunalar ba’zi darslarga qo‘shimcha topshiriq sifatida berildi. Darsga vaqt yetmagan holatlarda bu topshiriqlarni uy vazifasi sifatida ham berish mumkin. Har bir bob so‘ngida o‘tilgan mavzular bo‘yicha “Nazorat ishi” materiallaridan namuna keltirilgan. Shuningdek, har bir nazorat ishidan keyin o‘qituvchining ijodiy faoliyatidan kelib chiqqan holda mustaqil xatolar ustida ishlash darsini o‘tish mumkin. O‘qituvchi xatolar ustida ishlash darsida nazorat ishi natijalariga ko‘ra o‘quvchilar bilimida mavzular bo‘yicha aniqlangan bo‘shliqlarni bartaraf etish maqsadida xatolarni tushuntiradi. O‘quvchilar esa nazorat ishida berilgan topshiriqlarga o‘xshash topshiriqlarni bajarishadi va xulosalar chiqarishadi.

Darslikdagi ba’zi mavzular uchun QR kod joylashtirildi. Bu QR kodni skaner qilish orqali shu mavzuga doir videodarsni tomosha qilib, yangi mavzuni o‘zlashtirish mumkin. Bunda **http://uz.khanacademy.org** videodarslaridan foydalanildi. Bundan tashqari, darslikning mundarija qismida 6-sinf “Matematika” darsligi uchun ta’limiy o‘yinlarning va va **https://phet.colorado.edu/** platformasining QR kodi joylandi. Bu ta’limiy o‘yinlarning barchasi ushbu sinf mavzularidan kelib chiqib tuzilgan.

Darslik oxirida qo‘shimcha o‘rganish uchun tavsiya sifatida “Qiziqarli va mantiqiy topshiriqlar”, “Xalqaro baholash dasturiga oid topshiriqlar” bo‘limlari keltirilgan. Ulardan mavzuni o‘zlashtirishda yaxshi natijalarga erishayotgan o‘quvchilar bilan ishlashda yoki o‘quvchilarning fanga bo‘lgan qiziqishini oshirishda foydalanish mumkin. Odatda o‘quvchilar mavzu bo‘yicha asosiy tushunchalarni mustahkamlagandan so‘ng qiziqarli topshiriqlar kutishadi. Bu topshiriqlarni o‘quv yili yoki dars so‘ngida emas, balki dars jarayonida barchaga muammo sifatida taqdim etish orqali o‘quvchilar o‘ziga bo‘lgan ishonchni, do‘stona hamkorlikni his qilishiga imkoniyat yaratiladi hamda ularga g‘ayrat bag‘ishlanadi.

Mualliflar

MATEMATIKA FANIDAN MILLIY O‘QUV DASTURI

I. Matematika fanidan Milliy o‘quv dasturining maqsadlari

Matematika fanini o‘qitishdan ko‘zlangan maqsadlar quyidagilardan iborat:

- o‘quvchilar tomonidan matematik tushunchalar, xossalar, geometrik shakllar, usullar va algoritmlar haqidagi bilim, ko‘nikmalar egallanishini ta’minlash;
- inson kamoloti va jamiyat taraqqiyotida matematikaning ahamiyatini anglatish, ijtimoiy-iqtisodiy munosabatlar, kundalik hayotda matematik bilim va ko‘nikmalarni muvaffaqiyatli qo‘llashga o‘rgatish;
- o‘quvchilarning individual xususiyatlarini rivojlantirgan holda mustaqil ta’lim olish, kreativ, tanqidiy fikrlash va mantiqiy tahlil, qiziquvchanlik, muammolarni hal qilish, yangiliklar yaratishga bo‘lgan ko‘nikmalarini namoyon qilish va rivojlantirish;
- fanlar integratsiyasini inobatga olgan holda o‘quvchilarda milliy va umuminsoniy qadriyatlarni shakllantirish hamda ongli ravishda kasb tanlashga yo‘naltirish;
- kelgusida matematikadan bilim va ko‘nikmalar talab qilinadigan boshqa fanlarni o‘rganish uchun zarur bo‘lgan matematik mazmunni shakllantirish va rivojlantirish.

II. Matematika fanidan o‘quvchilarda rivojlantiriladigan tayanch kompetensiyalar

Umumiy o‘rta ta’lim tizimida o‘quvchilarda fanga oid kompetensiyalar bilan birgalikda tayanch kompetensiyalar shakllantirilishi belgilab berilgan. Turli fanlarni o‘rganish orqali o‘quvchilarda tayanch kompetensiyalarni shakllantirish o‘zlashtirgan bilim va ko‘nikmalarini turli hayotiy vaziyatlarda qo‘llay olishga qaratilishi maqsadga muvofiq.

Kommunikativ kompetensiya

Kommunikativ kompetensiyalarni shakllantirishda davlat tili, xorijiy tillarni o‘zlashtirishda mustaqil, ijodiy fikrlash, nutqni yozma va og‘zaki ravon bayon etish, to‘g‘ri talaffuz qilish, izohlab berish hamda erkin muloqot qilishga o‘rgatish zarur. Xususan, matematika fanining o‘z ilmiy tili, o‘z tushunchalari, belgi va timsollari ham mavjud bo‘lib, bu tilda muloqot qilish – kommunikativ kompetensiyalarni shakllantirish omili sifatida qaralishi zarur.

Axborot bilan ishlash kompetensiyasi

Fanlarni o‘qitishda axborot bilan ishlash kompetensiyasini samarali rivojlantirish imkoniyatlarini kengaytiruvchi zamonaviy axborot-telekommunikatsiya vositalaridan muntazam foydalanish zarur. Bunda o‘quvchilarni darslik, elektron resurslar va turli o‘quv manbalari bilan ishlash, matematika faniga oid axborotlarni turli manbalardan izlash, tahlil qilish va axborot xavfsizligiga rioya qilgan holda axborot vositalari bilan ishlash ko‘nikmalarini shakllantirishda turli amaliy dasturiy paket va ta’minotlardan, mobil qurilma (telefon, planshet va boshqa gadjet)lardan foydalanish tavsiya etiladi.

O‘z-o‘zini rivojlantirish kompetensiyasi

O‘z-o‘zini rivojlantirish kompetensiyasini shakllantirishda umuminsoniy qadriyatlar asosiga qurilgan fazilatlarga ega bo‘lish, Vatanni sevish, jamiyat va tabiat haqidagi bilimlarga ega bo‘lish, yangiliklarga intilish va o‘zlashtirgan nazariy bilimlari asosida mustaqil qaror qabul qilishga, jamiyatda ro‘y berayotgan progressiv va innovatsion o‘zgarishlardan xabardor va daxldor bo‘lish, doimo zamonaviy bilim va ko‘nikmalarni egallashga intilish, hamda ulardan kundalik hayotda foydalana olishga o‘rgatish zarur. Matematika fanini puxta o‘zlashtirish orqali o‘quvchilar tartib-intizomga o‘rganadilar, har bir muammoga matematik masala sifatida qarab, uni yechishda qat’iyatli bo‘ladilar.

Ijtimoiy-emotsional va fuqarolik kompetensiyasi

Ijtimoiy-emotsional va fuqarolik kompetensiyasini shakllantirishda fuqarolik burchi, ijtimoiy va siyosiy rivojlanish, favqulodda vaziyatlar, ekologik muammolar haqida bilimlarga

ega bo‘lish hamda badiiy va san’at asarlarini tushunish, ularni asrashda tashkilotchilik xislatlarini rivojlantirishdan iborat. Shuningdek, matematika o‘quvchilarni haqgo‘ylik, vatanga sadoqat ruhida tarbiyalaydi. Matematika fanini puxta o‘rgatish o‘quvchilarni jamiyatning faol fuqarosi sifatida rivojlantirib borishga zamin yaratadi.

III. Matematika fani bo‘yicha “Al-jabr” ta’lim standartlari (bitiruvchilarning o‘zlashtirgan bilim va ko‘nikmalariga qo‘yilgan talablar)

Matematika fani bo‘yicha ta’lim standartlari matematika faniga umumta’lim maktablari (11-sinf) bitiruvchilarining fan bo‘yicha bilim, ko‘nikma va kompetensiyalariga qo‘yilgan umumlashgan talablardan iborat bo‘lib, ular matematik mazmun va amaliy faoliyat standartlariga bo‘linadi.

IV. Matematik mazmun standartlari (bilim va ko‘nikmalar)

Qisqacha tavsifi: asosiy matematik tushunchalar va munosabatlar mohiyatini tushunish va ulardan tipik o‘quv topshiriqlarini bajarishda foydalanish.

Ushbu standartlar o‘quvchilar matematikani o‘rganish orqali nimani tushunishi va nimalarni bajarishga qodir bo‘lish kerakligini belgilab beradi. Matematikada tushunishning o‘ziga xos belgilaridan biri bu – o‘quvchining matematik o‘zlashtirish darajasidan kelib chiqqan holda muayyan matematik ifodaning to‘g‘ri yoki noto‘g‘ri ekani yoki muayyan matematik qoidaning qayerdan kelib chiqishini asoslab berish qobiliyatidir. Matematik tushuncha mohiyatini tushunish va tipik amallarni bajarish ko‘nikmasi bir xilda muhim bo‘lib, ular muayyan murakkablik darajasidagi standart topshiriqlar yordamida baholanadi.

Matematik mazmun standartlari umumlashgan talablar ko‘rinishida ifodalanib, ular matematikaning quyidagi mazmun sohalari va bo‘limlarini qamrab oladi (kelgusida ishlatish qulay bo‘lsin uchun mazmun sohalari va bo‘limlar nomi bosh harfi bilan kodlanadi):

- **sonlar va amallar (SA);**
- **algebra va funksiyalar (AF);**
- **geometriya va o‘lchashlar (GO‘);**
- **statistika va ehtimollik (SE);**
- **matematik analiz (MA).**

Mazmun sohasi	Mazmun sohasi bo‘limlari	Bo‘lim bo‘yicha standartning qisqacha tavsifi va kodi
Sonlar va amallar (SA)	Son tushunchasi	Sonlar va miqdorlar (kattaliklar) haqida tushunchaga ega bo‘lish, ularni tasvirlash usullarini va sanoq sistemalarini bilish (SA.ST)
	Amallar va hisoblashlar	Matematik amallar mohiyatini bilish, sonlar va kattaliklar o‘rtasida munosabatlarni o‘rnatish va tushunish hamda masalalarni yechishda qo‘llash. Sonlar va kattaliklar ustida hisoblashlarni qiyinchiliksiz bajarish, natijaga tegishli baho berish, ularni chamalash va yaxlitlash (SA.AH)
Algebra va funksiyalar (AF)	Algebraik ifodalar va almashtirishlar	Matematik belgi va timsollar yordamida hayotiy vaziyatlar va tabiatdagi hodisalarni, miqdoriy munosabatlarni matematik tilda ifodalash, tushunish va tahlil qilish, asosiy algebraik almashtirishlarni bilish va ulardan masalalar yechishda foydalanish (AF)
	Munosabatlar va funksiyalar	Tabiat va jamiyatdagi qonuniyatlar, munosabatlar mohiyatini funksiya sifatida tushunish, bu jarayonlardagi o‘zgaruvchilar orasidagi munosabatlarni matematik nuqtayi nazardan talqin qilish (AF)
	Tenglama va tengsizliklar	Chiziqli, kvadratik, ratsional, irratsional, ko‘rsatkichli (eksponensial), logarifmik, darajali va trigonometrik tenglamalar, tengsizliklar va ularning sistemalarini yechishda standart yechish metodlarini qo‘llay olish hamda yechimlarni ko‘rgazmali ifodalash (AF)
Geometriya va o‘lchashlar (GO‘)	Geometrik shakllar	Yassi va fazoviy geometrik shakllarni chizma, model va real voqelikda taniy olish, ularning asosiy xossalarini bilish (GO‘)
	Geometrik mushohada va masala yechish	Geometrik shakllarning xossalari haqida geometrik va mantiqiy fikrni rivojlantirish, geometrik isbot qilish metodlari va masalalarni yechish algoritmlardan foydalanish, asosli matematik mulohazalar yuritish (GO‘)
	Geometrik yasashlar	Koordinatalar sistemasi va boshqa tasvirlash tizimlarida geometrik munosabatlarni tasvirlash va ularning geometrik o‘rnini aniqlash, sodda geometrik yasashlarni amalga oshirish, simmetriya va geometrik shakl almashtirishlardan foydalanish (GO‘)
	O‘lchashlar va o‘lchash usullari	Turli obyektlarning o‘lchanadigan elementlarini, o‘lchov birliklarini bilish, o‘lchov tizimlari va jarayonlarining mohiyatini tushunish, o‘lchash jarayonida mos o‘lchov usullari, formulalar, o‘quv qurollari, multimediali interaktiv ilovalar, kalkulyator va o‘lchov asboblaridan foydalanish (GO‘)

Statistika va ehtimollik (SE)	To‘plamlar va mantiq elementlari	To‘plamlar ustida amallar mohiyatini bilish va bajara olsh, sodda mantiqiy xulosalarni chiqara olish (SE)
	Ma’lumotlarni statistik tahlil qilish	Kerakli ma’lumotlarni topish, aniqlash, yig‘ish va ularga ishlov berish hamda natijalarni talqin qilish, turli vositalar yordamida taqdim qilish; ma’lumotlarni tahlil qilish uchun mos statistik ishlov berish usullarini tanlash va qo‘llash, ma’lumotlar asosida tegishli xulosa qilish va bashoratlarni ishlab chiqish va ularni baholash (SE)
	Kombinatorika asoslari	Kombinatorika masalalari mohiyatini tushunish va ularni yechish algoritmidan hayotiy masalalarni yechishda foydalanish (SE)
	Ehtimolliklar nazariyasi asoslari	Tasodifiy, statistik hodisa va jarayonlar haqida tasavvurga ega bo‘lish, ularni tadqiq qilish, ehtimollik modellarini ishlab chiqish, ularni talqin qilish, baholash va ulardan foydalanish (SE)
Matematik analiz (MA)	Funksiya va uning tatbiqlari	Funksiyaga oid asosiy tushunchalarni, uning umumiy xossalari va turlarini bilish, aniqlay olish, shuningdek, asosiy elementar funksiyalarni taniy olish, ularning asosiy xossalarini bilish, ularni tenglama va tengsizliklarni hamda amaliy masalalarni yechishda qo‘llay olish (MA)
	Hosila va uning tatbiqlari	Funksiyaning uzluksizligi va hosilasi tushunchalarining mohiyatini bilish, hosilaning geometrik va fizik ma’nolarini tushunish hamda funksiyalarni hosila yordamida tekshirish algoritmini bilish, ularni funksiyalarning xossalarini aniqlashda, shuningdek, amaliy, ekstremumga doir masalalarni yechishda qo‘llay olish (MA)
	Boshlang‘ich funksiya, aniq integral va uning tatbiqlari	Boshlang‘ich funksiya va aniq integral tushunchalarining mohiyatini bilish va ulardan turli amaliy (yuz va hajmlarni hisoblash, bajarilgan ishni topish) masalalarni yechishda foydalana olish (MA)

V. Amaliy faoliyat standartlari (kompetensiyalar)

Qisqacha tavsifi: o‘zlashtirilgan bilim va ko‘nikmalarni amaliy masalalarni yechishda va notanish vaziyatlarda qo‘llay olish (kompetensiyalar).

Mazkur standartlar ham umumlashgan mazmunda bo‘lib, ular o‘quvchilarning quyidagi amaliy faoliyati sohalarini qamrab oladi (kelgusida ishlatish qulay bo‘lsin uchun bu sohalar mos harflar bilan kodlanadi):

- **mulohaza yuritish (MY);**
- **matematik modellashtirish (MM);**
- **muammoni hal qilish (MH):**
- **muloqot qilish (MQ).**

Amaliy faoliyat turi	Amaliy faoliyatning qisqacha tavsifi	Amaliy faoliyat standartining qisqacha tavsifi va kodi
Mulohaza yuritish (MY)	Matematikaga oid fikrni asoslash, isbotlash yoki o‘zgalar fikriga munosabat bildirish uchun mantiqan asosli va tushunarli dalillarni keltirish	Aqliy faoliyatga asoslangan mantiqiy fukrlash, taxmin qilish, xulosa chiqarish, dalillar keltirish, asoslash, xulosalash, asoslov va sabablar ustida fikrlash (MY)
		Qo‘llanadigan ta’riflar, qoidalar, tushunchalar, algoritm va usullar, matematik yechimlar va xatolar ustida fikr yuritish (MY)
		Matematik tushunchalar orasidagi aloqalarni tanish va ulardan foydalanish (MY)
		Yaxlit matematik tushunchani hosil qilish uchun matematik tushunchalarni birlashtirish yoki birini ikkinchisining ustiga qurish (MY)
Matematik modellashtirish (MM)	O‘quv va hayotiy muammolarni matematika tilida ifodalash, ularning matematik modelini qurish	Muammoli vaziyatlar mohiyatini o‘qib tushunish, tahlil qilish va unda keltirilgan muammoni aniqlash (MM)
		Tabiat, jamiyatdagi hodisa va jarayonlarni tushuntirish va modellashtirish uchun turli matematik talqin usullaridan foydalanish (MM)
		Muammoni matematik masala ko‘rinishda ifodalash, uning matematik modelini tuzish (MM)
Muammoni hal qilish (MH)	Matematikani qo‘llab muammoni hal qilish	Hayotiy muammo va amaliy matematik masalalarni yechishda o‘rganilgan matematik tushunchalar, faktlar, g‘oyalar, qonuniyatlar, algoritmlar va metodlardan foydalanish (MH)
		Muammo (masala)ni yechishda mantiqiy, kreativ fikrlash, matematik mushohada yuritish va ilmiy izlanish usullari: kuzatish, o‘lchash, tajriba o‘tkazish, analiz va sintez, induksiya va deduksiya, taqqoslash va analogiyalardan foydalanish (MH)
		Muammo (masala)ni yechishning muqobil usullari va algoritmlarini tahlil qilish, tanlash va asoslash (MH)

		Muammo (masala)ni yechish jarayonida yangi matematik bilimlarni hosil qilish va ularni o‘zlashtirish (MH)
		Matematik taxminlarni ifodalash va tadqiq qilish, matematik asoslash, taqqoslash va baholash (MH)
		Matematik yechimni real muammo mazmuniga ko‘chirish va matematik masalada tasvirlangan real muammoga nisbatan uni talqin qilish, topilgan yechimning muammo haqiqiy yechimiga mosligini, yaqinligini baholash (MH)
		Muammoni hal qilish algoritmlarini hayotiy vaziyatlar asosiga qurilgan kichik tadqiqot, loyiha ishini bajarish jarayonida namoyish etish va taqdimot qilishda AKT imkoniyatlaridan foydalanish (MH)
Muloqot qilish (MQ)	Matematik tushuncha, belgi va timsollar asosida matematika tilida o‘zaro muloqot qilish	Matematik fikrni og‘zaki va yozma yetkazish, o‘zgalar bilan o‘zaro muloqot qilish uchun matematika tilidan, belgi va timsollardan o‘rnida foydalanish (MQ)
		Boshqalarning matematikaga oid fikrlarini tushunish, tahlil qilish, baholash va ularga munosabat bildirish (MQ)

Matematika fanidan amaliy faoliyat standartlari har bir sinf kesimida tegishli mazmun standartlarida o‘z aksini topgan. Amaliy faoliyat standartlari mazmun standartlariga o‘zaro mos bo‘lgan, o‘quvchining yoshga doir fiziologik imkoniyatlari, aqliy va amaliy faoliyat sohalaridan kelib chiqib singdirilgan.

6-SINF UCHUN MATEMATIKA FANIDAN O‘QUV DASTURI VA TAVSIYAVIY SOATLAR TAQSIMOTI

(haftasiga 5 soatdan, jami 170 soat)

Bo‘lim va ajratil-gan soat	Mavzular	O‘quv maqsadlari (standart elementlari)
V SINFDA O‘TILGANLARNI TAKRORLASH (5 soat)	**Natural sonlar ustida amallar.** **Tub va murakkab sonlar, EKUB va EKUK.** **Bir xil maxrajli kasrlarni qo‘shish va ayirish.** **Geometrik shakl va o‘lchashlar.**	
I bob. KASRLARNI QO‘SHISH VA AYIRISH (15 soat)	**Kasrning asosiy xossasi.** Teng kasrlar. Kasrning asosiy xossasi. (2 soat)	M6.SA.1. Bir-biriga teng, lekin surat va maxrajlari har xil bo‘lgan kasrlar haqida tushunchaga ega bo‘ladi. M6.SA.2. Kasrning asosiy xossasini biladi va teng kasrlarni aniqlashda uni qo‘llay oladi.
	Kasrlarni qisqartirish. Kasrlarni qisqartirish. EKUB dan foydalanib kasrlarni qisqartirish. (2 soat)	M6.SA.3. Kasrning asosiy xossasi, EKUBdan foydalanib kasrlarni qisqartiradi.
	Oddiy kasrlarni umumiy maxrajga keltirish. Kasrlarni umumiy maxrajga keltirish. Kasrning asosiy xossasidan foydalanib kasrlarni umumiy maxrajga keltirish. EKUKdan foydalanib kasrlarni umumiy maxrajga keltirish. (3 soat)	M6.SA.4. Kasrning asosiy xossasidan foydalanib kasrlarni umumiy maxrajga keltiradi. M6.SA.5. EKUKdan foydalanib kasrlarni umumiy maxrajga keltiradi.
	Kasrlarni taqqoslash. Kasrlarni umumiy maxrajga keltirib taqqoslash; Taqqoslashning boshqa usullari. (2 soat)	M6.SA.6. Kasrlarni umumiy maxrajga keltirib taqqoslashni biladi. Taqqoslashning boshqa usullarini biladi. To‘g‘ri va noto‘g‘ri kasrlarni o‘z ichiga olgan kasrlarni taqqoslaydi va tartiblaydi va ularni son qatoriga joylashtiradi.
	Kasrlarni qo‘shish va ayirish. Har xil maxrajli kasrlarni qo‘shish. Har xil maxrajli kasrlarni ayirish. (2 soat)	M6.SA.7. Har xil maxrajli kasrlarni qo‘shadi va ayiradi.

	Aralash sonlarni qo‘shish va ayirish. Aralash sonlarni qo‘shish. Butunga kasrni qo‘shish. Aralash sonlarni ayirish. Butundan kasrni ayirish. (2 soat)	M6.SA.8. Aralash sonlarni qo‘shadi va ayiradi.
	Summativ baholash. 1-nazorat ishi (2 soat).	
II bob. KASRLARNI KO‘PAYTIRISH VA BO‘LISH (25 soat)	**Kasrlarni ko‘paytirish.** Natural sonni kasrga ko‘paytirish. Kasrni kasrga ko‘paytirish. (4 soat)	M6.SA.9. Natural sonni kasrga ko‘paytiradi. Kasrni kasrga ko‘paytiradi.
	Aralash sonlarni ko‘paytirish. Natural sonni aralash songa ko‘paytirish. Aralash sonni aralash songa ko‘paytirish. (3 soat)	M6.SA.10. Natural sonni aralash songa ko‘paytiradi. Aralash sonni aralash songa ko‘paytiradi.
	Sonning qismini topish. Sonning qismini topish. (2 soat)	M6.SA.11. Masalada berilgan vaziyatga qarab sonning qismini topadi.
	Ko‘paytirish amali xossalari. O‘rin almashtirish va guruhlash qonuni. Ko‘paytirishning qo‘shish va ayirishga nisbatan taqsimot qonuni. (3 soat)	M6.SA.12. O‘rin almashtirish, guruhlash, ko‘paytirishning qo‘shish va ayirishga nisbatan taqsimot qonunidan foydalanib kasrlarni ko‘paytiradi.
	O‘zaro teskari sonlar. O‘zaro teskari sonlar haqida tushuncha. Berilgan songa teskari sonni topish. (2 soat)	M6.SA.13. O‘zaro teskari sonlarni, topadi berilgan songa teskari sonni topadi.
	Kasrlarni bo‘lish. Kasrni natural songa bo‘lish. Kasrni kasrga bo‘lish. Aralash sonlarni bo‘lish. (4 soat)	M6.SA.14. Kasrni natural songa bo‘ladi. Kasrni kasrga bo‘ladi**.** Aralash sonlarni bo‘ladi.
	Qismiga ko‘ra sonni topish. Qismiga ko‘ra sonning o‘zini topish. (2 soat)	M6.SA.15. Qismiga ko‘ra sonning o‘zini topadi.
	Kasrlar ustida amallarga doir topshiriqlar. (3 soat)	M6.SA.9. Natural sonni kasrga ko‘paytiradi. Kasrni kasrga ko‘paytiradi. M6.SA.10. Natural sonni aralash songa ko‘paytiradi. Aralash sonni aralash songa ko‘paytiradi. M6.SA.12. Kasrni natural songa bo‘ladi. Kasrni kasrga bo‘ladi**.** Aralash sonlarni bo‘ladi. M6.SA.16. Qo‘shish, ayirish, ko‘paytirish va bo‘lishdan kelib chiqqan natijalarni eng sodda shaklda ifodalaydi.
	Summativ baholash. 2-nazorat ishi. (2 soat)	

III bob. O‘NLI KASRLARNI KO‘PAYTIRISH VA BO‘LISH (20 soat)	**O‘nli kasrni natural songa ko‘paytirish.** O‘nli kasrni natural songa ko‘paytirish. O‘nli kasrlarni 10, 100, 1000, … sonlariga ko‘paytirish. (2 soat)	M6.SA.17. O‘nli kasrlarni natural songa, 10, 100, 1000, … sonlariga ko‘paytirishni biladi.
	O‘nli kasrlarni ko‘paytirish. O‘nli kasrni o‘nli kasrga ko‘paytirish. (2 soat)	M6.SA.18. O‘nli kasrni o‘nli kasrga ko‘paytiradi.
	O‘nli kasrni natural songa bo‘lish. O‘nli kasrni natural songa bo‘lish. O‘nli kasrlarni 10, 100, 1000, … sonlariga bo‘lish. (2 soat)	M6.SA.19. O‘nli kasrlarni natural songa, 10, 100, 1000, … sonlariga bo‘lishni biladi.
	O‘nli kasrlarni bo‘lish. O‘nli kasrni o‘nli kasrga bo‘lish. O‘nli kasrlarni 0,1; 0,01; 0,001; … sonlariga ko‘paytirish va bo‘lish. (2 soat)	M6.SA.20. O‘nli kasrni o‘nli kasrga bo‘ladi.
	Kasrni o‘nli kasrga keltirish. Kasrning asosiy xossasidan foydalanib oddiy kasrni o‘nli kasrga keltirish. Bo‘lish orqali oddiy kasrni o‘nli kasrga keltirish. (2 soat)	M6.SA.21. Kasrning asosiy xossasidan foydalanib o‘nli kasrga keltiradi. Bo‘lish orqali oddiy kasrni o‘nli kasrga aylantiradi.
	Davriy kasrlar. Oddiy kasrni davriy kasrga aylantirish. Sof va aralash davriy kasrlar. (2 soat)	M6.SA.22. Oddiy kasrni davriy kasrga aylantiradi. Sof va aralash davriy kasrlarni farqlaydi.
	Sonning taqribiy qiymati. Sonlarni xona birliklarigacha yaxlitlash. (2 soat)	M6.SA.23. Sonlarni xona birliklarigacha yaxlitlaydi.
	O‘nli kasrlar ustida amallarga doir topshiriqlar. (3 soat)	M6.SA.24. Yozma va og‘zaki hisoblashlarning qulay usullarini qo‘llaydi. M6.SA.25. Oddiy va o‘nli kasrlar ustida to‘rt amalga doir misollarni yechadi.
	STEM topshiriq (loyiha ishi). (1 soat)	M6.SE.6. O‘zlashtirilgan bilim va ko‘nikmalar asosida, berilgan muammoli vaziyat bo‘yicha kichik o‘quv-tadqiqot mavzusi bo‘yicha loyiha ishini bajarish jarayonida amaliy faoliyat standartlari talablariga mos kompetensiyalarni shakllantirib boradi.
	Summativ baholash. 3-nazorat ishi. (2 soat)	

IV bob. BUTUN SONLAR VA ULAR USTIDA AMALLAR (25 soat)	**Butun sonlar.** Musbat sonlar. Manfiy sonlar. Butun sonlar haqida tushuncha. (2 soat)	M6.SA.26. Musbat, manfiy va butun sonlarni farqlaydi.
	Sonlar o‘qi. Musbat va manfiy butun sonlarni son o‘qida tasvirlash. Qarama-qarshi sonlar. (2 soat)	M6.SA.27. Musbat va manfiy butun sonlarni son (koordinata) o‘qida tasvirlaydi. Qarama-qarshi sonlarni biladi.
	Sonning moduli. Sonning moduli. Sonlar o‘qida sonning modulini tasvirlash. (2 soat)	M6.SA.28. Sonning modulini topadi. Koordinata o‘qida sonning modulini tasvirlaydi.
	Sonlarni taqqoslash. Butun sonlarni taqqoslash. (2 soat)	M6.SA.29. Butun sonlarni taqqoslaydi.
	Butun sonlarni qo‘shish. Bir xil ishorali butun sonlarni qo‘shish. Har xil ishorali butun sonlarni qo‘shish. (3 soat)	M6.SA.30. Butun sonlarni qo‘shadi va ayiradi.
	Butun sonlarni ayirish. Bir xil ishorali butun sonlarni ayirish. Har xil ishorali butun sonlarni ayirish. (3 soat)	M6.SA.30. Butun sonlarni qo‘shadi va ayiradi.
	Butun sonlarni ko‘paytirish. Bir xil ishorali butun sonlarni ko‘paytirish. Har xil ishorali butun sonlarni ko‘paytirish. (3 soat)	M6.SA.31. Butun sonlarni ko‘paytiradi va bo‘ladi. M6.SA.32. Butun sonlarning kvadrati va kubini topadi.
	Butun sonlarni bo‘lish. Bir xil ishorali butun sonlarni bo‘lish. Har xil ishorali butun sonlarni bo‘lish. (3 soat)	M6.SA.31. Butun sonlarni ko‘paytiradi va bo‘ladi. M6.SA.32. Butun sonlarning kvadrati va kubini topadi.
	Butun sonlar ustida amallarga doir topshiriqlar. (3 soat)	M6.SA.33. Butun sonlar ustida to‘rt amalga doir misollarni ishlaydi.
	Summativ baholash. 4-nazorat ishi. (2 soat)	

V bob. RATSIONAL SONLAR (15 soat)	**Ratsional sonlar.** Ratsional son haqida tushuncha. Ratsional sonlarni son o‘qida tasvirlash. Ratsional sonlarni taqqoslash. (2 soat)	M6.SA.34. Ratsional sonlarni tushunadi. Ratsional sonlarni son o‘qida tasvirlaydi va taqqoslaydi.
	Ratsional sonlarni qo‘shish va ayirish. Ratsional sonlarni qo‘shish. Ratsional sonlarni ayirish. (4 soat)	M6.SA.35. Ratsional sonlarni qo‘shadi va ayiradi.
	Ratsional sonlarni ko‘paytirish va bo‘lish. Ratsional sonlarni ko‘paytirish. Ratsional sonlarni bo‘lish. (4 soat)	M6.SA.36. Ratsional sonlarni ko‘paytiradi va bo‘ladi.
	Ratsional sonlar ustida arifmetik amallar. (2 soat)	M6.SA.37. Ratsional sonlar ustida to‘rt amalga doir misollarni ishlaydi.
	STEM topshiriq (loyiha ishi). (1 soat)	M6.SE.6. O‘zlashtirilgan bilim va ko‘nikmalar asosida, berilgan muammoli vaziyat bo‘yicha kichik o‘quv-tadqiqot mavzusi bo‘yicha loyiha ishini bajarish jarayonida amaliy faoliyat standartlari talablariga mos kompetensiyalarni shakllantirib boradi.
	Summativ baholash. 5-nazorat ishi. (2 soat)	
VI bob. GEOMETRIYA VA O‘LCHASHLAR (20 soat)	**Tekislikda koordinatalar sistemasi.** Dekart koordinatalar sistemasi. Koordinatalar sistemasidagi nuqtaning koordinatalari. Koordinatalar sistemasining I, II, III, IV choraklarida joylashgan nuqtalarning o‘rnini topish. Koordinatalar sistemasining I, II, III, IV choraklaridagi nuqtalar yordamida shakllar yasash. (2 soat)	M6.GO‘.1. Dekart koordinatalar sistemasidagi nuqtaning koordinatalarini topadi. Koordinatalar sistemasining I, II, III, IV choraklarida joylashgan nuqtalarning o‘rnini topadi. Koordinatalar sistemasining I, II, III, IV choraklaridagi nuqtalar yordamida shakllar yasaydi.
	Uchburchak. Uchburchakning asosiy elementlari, perimetri, burchaklari yig‘indisi. Noma’lum burchaklarni topish. Uchburchakning turlari. (2 soat)	M6.GO‘.2. Uchburchakning asosiy elementlari, perimetri, burchaklari yig‘indisini topadi. M6.GO‘.3. Uchburchaklarni burchaklari va tomonlari bo‘yicha turlarga ajratadi. M6.GO‘.4. Noma’lum burchaklarni topadi.

	Aylana va doira. Aylana va doira. Aylana va doiraning elementlari: markazi, vatari, diametri, radiusi va yoyi. (2 soat)	M6.GO‘.5. Aylana va doiraning elementlari: markazi, vatari, diametri, radiusi va yoyini farqlaydi, berilgan radius yoki diametrga asosan ularni yasaydi.
	Uchburchakning yuzi. To‘g‘ri burchakli uchburchakning yuzi. Uchburchakni to‘g‘ri to‘rtburchakka to‘ldirish orqali yuzini hisoblash. Katakli qog‘ozda yuzlarni hisoblash. (3 soat)	M6.GO‘.6. Uchburchakni to‘g‘ri to‘rtburchakka to‘ldirish orqali uning yuzini hisoblaydi. Katakli qog‘ozda yuzlarni hisoblaydi. M6.GO‘.7. To‘g‘ri burchakli uch-burchakning yuzini topa oladi.
	Aylana uzunligi va doira yuzi. Aylana uzunligi va doira yuzi. (2 soat)	M6.GO‘.8. Aylana uzunligi va doira yuzini topadi.
	Murakkab shakllarning yuzi. Teng shakllar. Teng shakllarning yuzi. Shakllarning yuzi xossalari. Murakkab shakllarning yuzini hisoblash usullari. (3 soat)	M6.GO‘.9. Teng va tengdosh shakl-lar haqida biladi. M6.GO‘.10. Teng shakllarning yuzini taqqoslaydi. Murakkab shakllarning yuzini hisoblash usullarini biladi.
	Murakkab fazoviy jism (to‘g‘ri burchakli parallelepiped (kuboid)**) hajmi.** Fazoviy jismlar hajmini to‘ldirishga doir amaliy masalalar. To‘g‘ri burchakli parallelepipedni kub bilan to‘ldirish. Murakkab fazoviy (to‘g‘ri burchakli parallelepiped) jismning hajmi. (2 soat)	M6.GO‘.11. Fazoviy jismlar hajmini to‘ldirishga doir amaliy masalalarni yechadi, jumladan, to‘g‘ri burchakli parallelepipedni kub bilan to‘ldiradi. Murakkab fazoviy (to‘g‘ri burchakli parallelepiped) jismning hajmini topadi. M6.GO‘.12. Yuz va hajm formulasidan foydalanadi.
	O‘lchov birliklari orasidagi munosabatlar. Narx-navo, massa, vaqt, uzunlik, yuza va hajm kabi kattaliklarga oid amaliy masalalar. (2 soat)	M6.GO‘.13. Standart o‘lchov birliklardan foydalanadi. O‘qiydi, yozadi va bir-biriga o‘zgartiradi. O‘nli kasrdan foydalanib uzunlik, massa, hajm va vaqt o‘lchovlarini mingdan birlar xonasigacha almashtiradi. M6.GO‘.14. O‘lchov bilan bog‘liq masalalarni o‘nli kasrning mingdan birlar xonasigacha yechadi.
	Summativ baholash. 6-nazorat ishi. (2 soat)	

VII bob. NISBAT, PROPORSIYA, FOIZLAR (20 soat)	**Nisbat. Proporsiyalar.** Nisbat haqida tushuncha. Proporsiya va uning hadlari. (3 soat)	M6.SA.38. Ikki son nisbati haqida tushunchaga ega bo‘ladi va mohiyatini tushunadi, ularni yozadi va o‘qiydi. M6.SA.39. Berilgan nisbatga teskari nisbatni topadi. M6.SA.40. Proporsiya ta’rifini ayta oladi, o‘qiydi va yozadi.
	Proporsiyaning asosiy xossasi. Proporsiyaning asosiy xossasi. Proporsiya asosiy xossasining tatbiqlari. (4 soat)	M6.SA.41. Proporsiyalarni ajratadi, tuzadi va proporsiyaning asosiy xossasi mohiyatini tushunadi va uni masalalar yechishda qo‘llaydi. M6.SA.41. Proporsiyaning asosiy xossasini tatbiq qiladi.
	Foizlar. Foiz haqida tushuncha. Sonni foizda va foizni sonda ifodalash. Sonning foizini va foizga ko‘ra sonni topish. Proporsiyadan foydalanib foizlarni hisoblash. (4 soat)	M6.SA.42. Foizni tushunadi. Sonni foizda va foizni sonda ifodalaydi. Sonning foizini va foizga ko‘ra sonni topadi. M6.SA.43. Proporsiya yordamida foizga oid masalalarni yechadi, sonning foizini, foizga ko‘ra sonning o‘zini va ikki sonning foiz nisbatini topadi.
	To‘g‘ri va teskari proporsional miqdorlar. To‘g‘ri proporsional miqdorlar. Teskari proporsional miqdorlar. To‘g‘ri va teskari proporsional miqdorlarning tatbiqlari. (4 soat)	M6.SA.44. To‘g‘ri va teskari proporsional miqdorlarni biladi va farqlaydi. To‘g‘ri va teskari proporsional miqdorlarni tatbiq qiladi.
	Masshtab. Masshtab haqida tushuncha. (2 soat)	M6.SA.45. Xaritalardagi masshtablar bo‘yicha haqiqiy o‘lchamni topadi. Haqiqiy o‘lchamni mashtabga o‘tkazadi. M6.SA.46. O‘xshash shakllar bilan bog‘liq masalalarni masshtabli omillarni qo‘llash orqali hal qiladi.
	STEM topshiriq (loyiha ishi). (1 soat)	M6.SE.6. O‘zlashtirilgan bilim va ko‘nikmalar asosida, berilgan muammoli vaziyat bo‘yicha kichik o‘quv-tadqiqot mavzusi bo‘yicha loyiha ishini bajarish jarayonida amaliy faoliyat standartlari talablariga mos kompetensiyalarni shakllantirib boradi.
	Summativ baholash. 7-nazorat ishi. (2 soat)	

VII bob. IFODALAR. TENGLAMALAR (12 soat)	**Sonli va harfiy ifodalar.** Sonli va harfli ifodalar, ularning qiymati. (2 soat)	M6.SA.47. Harfli ifodalarning qiymatini berilgan sonlar orqali topadi. M6.SA.48. O‘zgaruvchilarni ifodalash uchun harflar ishtirokidagi oddiy formulalardan foydalanadi. M6.SA.49. Noma’lum son qatnashgan masalalarni algebraik usulda ifodalaydi.
	Tenglama. Tengliklar va ularning xossalari. Tenglamani yechish. (4 soat)	M6.SA.50. Sonli tengliklar xossasini biladi va qo‘llaydi. M6.SA.51. Tenglama va uning ildizi haqida ma’lumotga ega bo‘ladi. M6.SA.52. Noma’lum qatnashgan tenglamalarni qanoatlantiradigan sonlarni topadi.
	Iqtisodiy mazmundagi masalalar. Xarid uchun jami to‘langan pulni topish formulasiga doir masalalar. Tovar narxi va miqdorini topishga doir masalalar. (2 soat)	M6.SA.53. Xarid uchun jami to‘langan pulni topish formulasiga doir, tovar narxini va miqdorini topishga doir masalalarni yechadi. M6.SA.54. Tovar narxini va miqdorini topishga doir masalalarni yechadi.
	Bajarilgan ishga doir masalalar. Bajarilgan ish miqdorini topish formulasiga doir masalalar. Mehnat unumdorligi va ishni bajarishga ketgan vaqtni topishga doir masalalar. (2 soat)	M6.SA.55. Bajarilgan ish miqdorini topishga doir, mehnat unumdorligi va ishni bajarishga ketgan vaqtni topishga doir masalalarni yechadi.
	Summativ baholash. 8-nazorat ishi. (2 soat)	

VIII bob. MA'LUMOTLAR BILAN ISHLASH (8 soat)	**Ma'lumotlar qatori va uning tahlili.** Jadvallar. Jadvallarni o'qish va tuzish. Ma'lumotlar qatori. Sodda vaziyatlarga doir ma'lumotlarni yig'ish va qayta ishlash. Sodda so'rovnomalar o'tkazish va uning statistik tahlili. Hayotiy masalalarni yechishda chiziqli va doiraviy diagrammalardan foydalanish (4 soat)	M6.ES.1. Jadvallarni o'qiydi va berilgan ma'lumotlar asosida sodda jadvallar tuzadi. M6.ES.2. Hayotiy masalalarni yechishni chiziqli va doiraviy diagrammalarda sharhlaydi. M6.ES.3. Sodda vaziyatlarga doir ma'lumotlarni yig'adi va qayta ishlaydi. M6.ES.4. Sodda so'rovnomalar o'tkazadi va ularning statistik tahlini qiladi.
	Ma'lumotlar tahlili. O'rta arifmetik qiymat, mediana, o'zgarish kengligi va modaga doir amaliy topshiriqlar. (2 soat)	M6.ES.5. Ma'lumotlarning o'rta arifmetik qiymati, medianasi, o'zgarish kengligi va modasiga doir amaliy topshiriqlarni yechadi.
	Summativ baholash. 9-nazorat ishi. (2 soat)	

TAKRORLASH (5 soat)	**Ratsional sonlar ustida arifmetik amallar.** **Geometriya va o'lchashlar.** **Tenglamalar.** **Nisbat, proporsiya, foiz.**	

MATEMATIKA FANINI O‘QITISH JARAYONINI TASHKIL QILISH

I. MATEMATIKA FANINI O‘QITISHGA METODIK YONDASHUVLAR

Matematika fanini o‘qitishga metodik tavsiyalar

Mamlakatimiz rivojlanishining hozirgi davrida jahon ta’lim yo‘nalishlari bo‘yicha ta’limning yangi ustuvor yo‘nalishlari belgilandi. Maktab ta’lim sifatini yaxshilashning asosiy yo‘naltiruvchi nuqtasi sifatida maktab o‘quvchilari funksional savodxonligini rivojlantirish, ularning jamiyatda faol ishlash, o‘z taqdirini o‘zi belgilash, o‘z-o‘zini takomillashtirish hamda o‘zini-o‘zi ro‘yobga chiqarish qobiliyatlarini talab qiladi.

Ilg‘or xalqaro tajribalar tahlillaridan kelib chiqib, o‘quvchilarning matematika faniga maktablarda funksional savodxonligini rivojlantirish amaliy faoliyat standartlarining quyidagi yo‘nalishlarini qamrab oladi:

- matematikaga oid ta’riflar, formulalar va boshqa faktlarni o‘quv va ma’lumotnomalardan qidirish va foydalanish;
- turli hayotiy vaziyatlarda algebraga doir bilim, ko‘nikma va grafik malakalarni qo‘llash;
- ma’lumotlarni to‘plash, tahlil qilish, qayta ishlash, sintez qilish;
- matematik formuladan foydalanish, muayyan xususiy hollarni umumlashtirish asosida miqdorlar orasidagi bog‘liqlikni ifodalovchi formulalarini mustaqil ravishda tuzish;
- o‘zlashtirilgan algebraik almashtirishlarni va funksional grafik tasvir va tasavvurlarni tevarak-atrofdagi yoki boshqa fanlardagi tegishli obyektlarni ifodalash va tahlil qilishda qo‘llash;
- o‘z nuqtayi nazarini asoslay olish, uning muhokamasida ishtirok etish va mantiqiy jihatdan to‘g‘ri xulosa chiqarish;
- matematik matn bilan ishlash (tahlil qilish va kerakli ma’lumotlarni chiqarib olish), o‘z fikrini matematik atamalar, timsollar va ramzlar yordamida aniq va to‘g‘ri yozish hamda og‘zaki va yozma izhor qila olish;
- amaliy xarakterdagi hayotiy masalalarni yechish, zarur hollarda ularni yechishda kerakli ma’lumotnomalar va hisoblash vositalarini qo‘llay olish,
- jadvallar, diagrammalar, grafik ko‘rinishdagi real raqamli ma’lumotlarni hamda statistik xarakterdagi ma’lumotlarni tahlil qilish;
- amaliy xarakterdagi matematik muammolarini hal qilish vositasi sifatida zamonaviy axborot texnologiyalaridan foydalanish;

Buning uchun matematika fanini o‘qitishda quyidagilarga e’tibor berish tavsiya etiladi:

- an’anaviy va zamonaviy o‘qitish usullarini uyg‘unlashtirib olib borish;
- puxta tanlangan topshiriqlar va mashg‘ulotlar orqali o‘quvchilarni rag‘batlantirish va rivojlantirish;
- o‘rganishni baholash orqali o‘quvchilarning bilim olishini qo‘llab-quvvatlash;
- o‘quvchilarning kichik o‘quv kashfiyotlari asosida faol o‘rganishni rag‘batlantirish;
- o‘quvchilarning kreativ va tanqidiy fikrlash qobiliyatlarini rivojlantirish;
- butun sinf ishini, individual va guruh faoliyatini tashkil etish orqali o‘quvchilarning hamkorlikda ishlash ko‘nikmalarini rivojlantirish;
- matematik nutqni to‘g‘ri va aniq shakllantirish;
- matnli masalalarni yechishda matematik mazmun va usullarni ajratib ko‘rsatish va yangi holatga qo‘llash;
- masala shartlarini matnli ko‘rinishdan matematik tilga o‘girish va bu shakl almashtirishlarning mazmun va mohiyatini ochib borish;

➢ o‘quvchilarga mavzuni chuqurroq o‘rganish imkonini beradigan tabaqalashtirilgan yondashuv asosida o‘quvchilarda ijodiy ishlash ko‘nikmalarini shaklllantirish va faol aqliy harakatlarni amalga oshirishlari uchun muammoli vaziyatlarni yaratish;

➢ ta’lim jarayonida o‘quvchilarning tabaqalashtirilgan individual shug‘ullanish trayektoriyalarini yaratish;

➢ darsda interfaol va faol ta’lim texnologiyalari: loyiha, tadqiqot, evristik, keys, muammoli o‘qitish kabi metodlardan o‘rnida foydalanish.

Yuqoridagilardan kelib chiqib, matematika fanini o‘qitishda quyidagi metodik jihatlarga e’tibor qaratish tavsiya etiladi:

1. Ta’lim jarayonining mohiyati katta hajmdagi o‘quv materialini o‘rganishga emas, balki kiritilayotgan matematik atama va faktlarni o‘quvchilarning tushunishi chuqurligiga e’tibor berish lozim. Odatda, xususan, bizning maktab matematika fani o‘quv dasturlarimizda buning aksi: dasturlarimizda o‘quv yuklamasi juda katta, o‘rganilishi kerak bo‘lgan mavzular juda ko‘p, vaqtimiz esa cheklangan. Buning oqibatida bu mavzularni chuqur o‘rganish imkoniyatlari cheklanib qoladi. Har bir mavzu chuqurroq o‘rganilishi lozim. O‘quvchilar oldin o‘rganilgan mavzuga uni takrorlash uchun emas, balki chuqurroq o‘rganish maqsadida qayta-qayta murojat qilishi kerak, ya’ni mavzuga uni jiddiyroq darajada chuqurroq o‘rganish uchun yana qaytish lozim. O‘quvchilar o‘zlashtirish darajasining yuqori bo‘lishini darsdan keyingi mashg‘ulotlar evaziga ushlab turish lozim. Sinfda mavzularni o‘zlashtirmagan qoloq o‘quvchi bo‘lmasligi lozim. Hamma e’tiborni barcha o‘quvchilar tomonidan mavzuning ma’lum darajada o‘zlashtirilishiga qaratish kerak bo‘ladi. Bu darajani oldinroq o‘zlashtirgan o‘quvchilar, boshqalar ham bu darajaga yetishgunga qadar mavzuni chuqurroq o‘rganishga o‘tadi.

2. Ta’lim jarayonini muayyan amaliy tajribadan boshlab, abstrakt tushunchalarga tomon borish lozim. Tushunchalarni o‘rganish uch bosqichda olib boriladi.

Birinchi bosqichda o‘quvchilar kiritilayotgan tushunchaga doir turli amaliy faoliyatlar bilan shug‘ullanadilar, tushunchaga doir turli moddiy narsalarni qo‘llari bilan ushlab ko‘radilar yoki ulardan turli modellarni yasaydilar.

Ikkinchi bosqichda yangi tushunchani timsollar yordamida ifodalaydilar. Ularni turli rasmlarda, diagramma yoki chizmalarda tasvirlaydilar.

Shundan keyingina uchinchi bosqichga, yangi tushunchaga oid abstrakt ta’rif, matematik timsol va belgilashlarga o‘tiladi. Boshqacha qilib aytganda, matematik tushunchalar bilan tanishish ko‘rgazmali misoldan boshlanadi, uning asosida abstrakt tushunchani “ushlash” va “ko‘rish” imkoniyati beriladi.

Ta’limning amaliy tajribadan abstrakt tushunchalarga tomon borishi o‘quvchilarda har bir mavzu bo‘yicha muayyan assotsiatsiyalar (yorqin, xotirada chuqur va mustahkam o‘rnashuvchi taassurotlar) hosil qilinadi. Bu taassurotlar eslanganda mavzuning turli jihatlari yodga tushishi ta’minlanadi.

Ta’lim jarayonining boshidan amaliy ishga yo‘naltirilganligi u yoki bu matematik tushunchaning nima sababdan o‘rganilayotganligi va uning hayotiy vaziyatlarda qachon va qayerda kerak bo‘lishini oldindan bilishga va ta’lim olishga bo‘lgan motivatsiyani (qiziqishni) oshiradi. Bu esa matematika fani hayotda kerakli va foydali bo‘lishi bilan birga jozibador bo‘lishini ham ta’minlaydi.

3. Matematik modellashtirishga alohida e’tibor qaratish lozim. Berilgan masala sharti ko‘rgazmali qilib vizuallashtiriladi. Masala modellashtiriladi va berilganlardan qulay ravishda foydalanish tashkil qilinadi, bosqichma-bosqich masalani yechishga kirishiladi.

4. Hamkorlikda o‘rganish va o‘zaro muloqotga katta e’tibor berish lozim. Masalalarni yechishda o‘quvchilarga matematik tushunchalarni va masalalar bo‘yicha o‘z fikrlarini bildirish, ularni birgalikda muhokama qilish va boshqalar fikrini ham tinglash imkoniyati yaratiladi. Natijada o‘quvchilar tushunchani yaxshiroq o‘zlashtiradi, matematika tilidan to‘g‘ri foydalanishga o‘rganadi, ba’zi hollarda u yoki bu masalaning bir necha yechimi bo‘lishi mumkinligini tushunib yetadi. O‘quvchilarni har safar masala yechayotganda masala sharti, uni yechish usul-

lari va yechimi haqida sinfdoshlariga ovoz chiqarib so‘zlab berishga undash lozim. Bu esa o‘z navbatida mavzuni, masalani yechish yo‘llarini yaxshiroq eslab qolishlarini ta’minlaydi. Shuningdek, o‘quvchilar bir necha kishilik kichik guruhlarda masalani jamoa bo‘lib yechish, mavzuni qanday tushunganliklarini bir-birlariga aytib berish, yechimlarni muhokama qilish hamda jamoaviy ishlarni bajarish kabi interfaol ishlar bilan shug‘ullanishi zarur.

5. O‘quvchilarni eslab qolishga emas, masala (muammo)ni yechishga o‘rgatish lozim. Odatda darsni yangi turdagi masalani yechish qoidasidan emas, balki bevosita notanish masalani yechishdan boshlash tavsiya qilinadi. O‘quvchilar oldingi bilim va ko‘nikmalari asosida intuitiv ravishda masalani yechishga urinib ko‘radilar. Ular birgalikda “urinish, xato qilish va uni tuzatish” orqali mulohaza yuritadi, xatolar qiladi hamda bu xatolar ustida ishlaydi, shu asosida to‘g‘ri yechimga bosqichma-bosqich yaqinlashib boradi. Bu o‘rinda o‘quvchilar xato qilish unchalik yomon ish emasligini, aynan turli xato yechimlarni tahlil qilish va tekshirish (kichik tadqiqot) jarayoni bora-bora ularni to‘g‘ri yechimga olib borishini o‘z tajribalari asosida tushunib yetadi.

➢ *Matematika ta’limiga kompetensiyaviy yondashuv*

Matematika ta’limiga kompetensiyaviy yondashuv o‘quvchilar kasbiy, shaxsiy faoliyatga doir kundalik hayotda uchraydigan holatlarda samarali harakat qilishga imkon beradigan turli ko‘rinishdagi malakalarni egallashini nazarda tutadi. Shunga ko‘ra, kompetensiyaviy yondashuvda e’tibor matematik ta’limning amaliy va tatbiqiy yo‘nalishlarini kuchaytirishga qaratiladi.

Matematika darslarini tashkil qilishda nazariyadan ko‘ra amaliyotga ko‘proq e’tibor qaratish hamda o‘quvchilarga tayyor o‘quv materiallarini berishga asoslangan yondashuvdan ma’lum darajada voz kechish talab qilinadi. Matematika darslarida ko‘proq keys, tadqiqot, loyiha, kichik o‘quv kashfiyotlari kabi interaktiv metodlardan foydalanish tavsiya etiladi. O‘quvchilarda kichik tadqiqotchilik ko‘nikmalarini shakllantirishda kuzatish, tajriba, o‘lchashlar, analiz (tahlil) va sintez, induksiya va deduksiya, taqqoslash va analogiya kabi ilmiy izlanish metodlaridan o‘rnida foydalanish talab etiladi. O‘quvchilarda bilim va ko‘nikmalarni shunchaki shakllantirib qolmasdan, ularni hayotiy vaziyatlarda qo‘llay olish kompetensiyalarini ham tarkib toptirish muhim ahamiyat kasb etadi.

➢ *STEAM - ijodkorlik texnologiyasi*

STEAM (S – science – tabiiy fanlar, T – technology – texnologiya, E – engineering – muhandislik, A – art – san’at, M – mathematics – matematika) ta’lim texnologiyasi aniq fanlar blok-modulida o‘quvchilarning egallagan bilim, ko‘nikma va malakalarini kundalik hayot bilan bog‘liqligini ko‘rsatishda dars va sinfdan tashqari mashg‘ulotlarda o‘quv tadqiqotlarini o‘tkazish, tajribalarni bajarish, loyihalashtirishga yo‘naltirilgan ijodkorligini tarbiyalash, yangiliklar yaratishga bo‘lgan qiziqishlarini rivojlantirishga qaratilgan. Bu texnologiyani amalga oshirishda o‘quvchilar tomonidan turli texnik qurilmalarni yasash uchun loyihalar yaratish, loyiha asosida qurilmaning maketini yasash va uni amaliyotda ishlatib ko‘rish, kamchiliklarini topish hamda uni bartaraf etish kabi vazifalar bajariladi.

➢ *Loyiha ishi bo‘yicha o‘quvchilar faoliyatini tashkil qilish*

O‘quvchilar bir o‘quv yilida o‘zlari qiziqqan fan yoki ta’lim sohasidan faqat bitta loyiha ishini bajarishlari tavsiya etiladi. Loyiha ishi mavzulari o‘qituvchilar tomonidan bitta yoki bir necha o‘quv fanlari doirasida muammoli vaziyat yoki keys sifatida tanlanadi. Loyiha ishi mavzusi ustida o‘quvchilar alohida-alohida yoki qiziqishlariga qarab 3 – 4 kishilik guruh bo‘lib ishlashlari ham mumkin. Loyiha ishi o‘quv yili oxirida o‘tkaziladigan himoya bilan tugaydi. Himoya bitta yoki bir necha o‘quv fanlari doirasida konferensiya tarzida o‘tkazilishi mumkin.

Loyiha ishi ustida o‘quvchilarning individual yoki guruh ishi quyidagi o‘quv faoliyatlarni o‘z ichiga olgan ishlab chiqish bosqichlaridan iborat bo‘lishi mumkin:

- *tayyorgarlik bosqichi*: o‘z izlanish

faoliyatlarini rejalashtirish, motivatsiya, muammoli vaziyatni aniqlash, tadqiqot mavzusini tanlash;

- *loyihalash bosqichi*: loyihaning maqsadini belgilash, faoliyatni amalga oshirishning aniq rejasini tuzish, vazifalarni o‘zaro taqsimlab olish;
- *amaliy bosqich:* muammoni tadqiq etish, kerakli ma’lumotlarni to‘plash va qayta ishlash, muammoning matematik modelini yaratish, matematikani qo‘llash, muqobil yechimlarini aniqlash va ulardan eng maqbulini tanlash hamda uni asoslash;
- *tahlil va talqin bosqichi*: zarur hollarda so‘rovlar yoki tajribalar o‘tkazish, rejalashtirilgan ishlar va olingan natijalarni taqqoslash, tahlil qilish, real muammoga nisbatan talqin qilish, umumlashtirish va xulosalash;
- *nazorat va baholash bosqichi*: o‘z faoliyatlarini tahlil qilish va baholash, ijobiy natijalarni va yo‘l qo‘yilgan xatolarni tahlil etish, xatolarni to‘g‘rilash yo‘llarini izlash, real holat bilan bog‘liqlikda loyihaga o‘zgartirishlar kiritish;
- *natijalarni rasmiylashtirish bosqichi*: loyiha ishi natijalari bo‘yicha hisobot tayyorlash;
- *yakuniy bosqich*: loyiha ishi himoyasi uchun taqdimot tayyorlash va uni himoya qilish.

O‘quvchilar loyiha ishi bo‘yicha izlanishlarini odatda darsdan tashqari mustaqil mashg‘ulotlarda olib borishadi. Dasturda belgilangan dars soatlarida esa turli loyiha ishlaridan namunalarni muhokama qiladilar, birgalikda muayyan loyiha ishi bo‘yicha guruhlarda ishlashadi, shu bilan birga o‘z loyiha ishlari mavzusi bo‘yicha maslahatlar oladilar.

Yuqoridagilardan ko‘rinib turibdiki, loyiha ishi bo‘yicha o‘quvchilar faoliyati an’anaviy ta’limdan tubdan farq qiladi. Zero, bunda o‘quvchilarga bilimlar tayyor holda uzatilmaydi, balki muammo tarzida qo‘yiladi, o‘quvchilar qo‘yilgan muammoni o‘zlari mustaqil yechadilar. Bilimlar o‘qitishning maqsadi bo‘lmay, muammoni yechish vositasiga aylanadi. O‘quvchilar yangi bilimlarni o‘zlashtirishning o‘zlari uchun qanchalik zarur ekanini his qiladilar, bu esa ularda motivatsiyaning sezilarli darajada o‘sishiga olib keladi. Ularning o‘quv-amaliy faolligi kuchayadi. Mustaqil ishlash darajalari ortadi. O‘quvchilar kichik guruhlarga bo‘linib, muammoni aniqlab oladilar, uni hal qilish uchun qanday manba va bilimlar kerakligini belgilaydilar, manbalar bilan ishlaydilar, muammoni hal etishning olingan variantini umumlashtiradilar. Bunda o‘qituvchi shunchaki jimgina kuzatib turuvchi bo‘lmay, zarur paytda o‘quvchilarga kerakli maslahat va yordamini berib turadi.

II. MATEMATKA FANINING BOSHQA FANLAR BILAN INTEGRATSIYASI

Matematika fanini o‘qitishda nafaqat uning bo‘limlar orasidagi o‘zaro ichki, balki tashqi, ya’ni STEAM yoki turdosh blok-modullar tarkibiga kiruvchi fanlar bilan integratsiyasi ham katta ahamiyatga ega.

Jumladan, matematikaning quyidagi fan yo‘nalishlari bilan o‘zaro chambarchas aloqalari muhim hisoblanadi:

➢ ***Matematika va tabiiy fanlar***

Matematika va tabiiy fanlar orasidagi bog‘liqlik modellashtirish, o‘lchashlar, tajriba, tadqiqotlar, tajribaga asoslangan (empirik) mulohazalarga quriladi. Tabiiy fanlar va matematikada o‘quvchilar miqdorlar va munosabatlar, tabiat qonunlarini ifodalovchi modellarini ishlab chiqadilar. Ular avval turli noan’anaviy birliklar yordamida, keyin rasmiy birliklar yordamida o‘lchash bilan tanishadilar. Keyinchalik o‘lchashda noaniqlik va ishonchlilik masalalarini ko‘rib chiqadilar. O‘quvchilar sifat va miqdoriy ma’lumotlarni yig‘adilar, ularni tahlil qiladilar va turli ko‘rinishlarda ifodalaydilar. O‘quvchilar sonli ma’lumotlar va grafiklar asosida ma’lumotlarni tahlil qilish, turli qonuniyatlarni aniqlash ko‘nikmalarini egallaydilar.

Fizika fanini o‘qitishda o‘quvchilar tabiat hodisalarini va asosiy fizik jarayonlarni anglash bilan birga, texnika va texnologiyalarni rivojlantirishda matematik formulalarni qo‘llashni o‘rganadilar. Ko‘pgina fizik masalalar tenglama yoki tenglamalar sistemasini tuzish va ular bilan ishlash ko‘nikmasining shakllangan bo‘lishini taqozo etadi. Fizika fanini o‘qitishda matematika fani nafaqat hisoblash apparati sifatida, balki matematik mulohazalar yordamida voqelik, hodisaning xarakteri haqida fizik xulosalar chiqarishga hamda mazkur jarayonlarni tatqiq qilish, matematik tenglamalarni yechish orqali fizik hodisalar haqida fikr yuritish imkonini beradi. Fizik masalalarni matematika darslarida tahlil qilish o‘quvchilarning mantiqiy fikrlash qobiliyatini, aqlini olamning yagona manzarasiga oid tafakkurlarini rivojlantirish hamda egallagan bilimlaridan hayotiy muammolarni hal qilish, kundalik faoliyatda foydalanish ko‘nikmasini shakllantirishni ko‘zda tutadi.

Biologiya fani o‘quvchilarda jonli tabiatning obyekti va tizimini his etishni, jonli va jonsiz tabiat o‘rtasidagi aloqalarni shakllantiradi. Bir vaqtning o‘zida atrofimizni o‘rab turgan jonli tabiatga ijobiy munosabat, tabiiy rangbaranglikni saqlab qolish, bunga javobgarlik hissi rivojlanadi. Matematika darslarida jonli tabiatning biologik qonuniyatlari va modellari haqidagi hayotiy masalalarni tahlil qilish orqali bu ikki fan orasidagi integratsiya ta’miinlanadi.

Kimyo fani o‘quvchilarda organik va anorganik moddalar hamda tuzilmalarni tabiatning obyekti sifatida his etish ko‘nikmalarini shakllantiradi. Matematika darslarida moddalar va tuzilmalarning tuzlishiga oid geometrik, sifat va miqdoriy kattaliklarni tahlil qilish orqali ularning kimyoviy xususiyatlarini o‘rganish, tadqiq qilish hamda xulosa chiqarish orqali bu ikki fan orasidagi uzviy aloqadorlik ta’minlanadi.

Geografiya fani o‘quvchilarda tabiat in’omlari va insonning iqtisodiy faoliyati natijasida yaratilgan obyektlarni tizimli ravishda, birgalikda his etishni shakllantiradi. Matematika darslarida geografik obyektlarga doir hayotiy masalalar yechish va tahlil qilish orqali bu ikki fan orasidagi aloqadorliklar aniqlanadi.

➢ ***Matematika va raqamli texnologiyalar***

Matematika va raqamli texnologiyalar orasidagi aloqadorlik ma’lumotlar, hisoblash va algoritmik fikrlashga quriladi. Axborot-kommunikatsiya texnologiyalaridan (AKT) foydalanish kompetensiyasi ta’lim olish va kundalik turmushda mazkur texnologiyalarni mohirona va ijodiy qo‘llashdan iborat. Informatika va axborot texnologiyalari fani matematika fanini o‘qitish jarayonining samaradorligini turli ko‘rinishdagi axborot-kommunikatsiya texnologiyalari va kompyuter texnikasidan foydalanish orqali oshirishga ulkan imkoniyatlar yaratadi. O‘quvchilar ta’lim olish jarayonida axborotni izlash, yaratish va qayta ishlash, ma’lumot va g‘oyalarni almashish, multimediali

kompyuter texnikasi, dasturiy ta’minotlar va ilovalar yordamida o‘z faoliyatlarini baholash va takomillashtirish orqali AKT ko‘nikmalarini rivojlantiradilar. Matematikada algoritmlarni yaratish va loyihalash, loyihani amalga oshirish ta’limda hisoblashga qurilgan yondashuvning, matematikada tajribalar o‘tkazishning ajralmas qismidir. Matematika fanidan bajariladigan loyihalar doirasida tajribalar o‘tkazish asosida o‘rganishni raqamli texnologiyalar to‘ldiradi, hisoblash va algoritmik fikrlash ko‘nikmalarini rivojlantirishni qo‘llab-quvvatlaydi.

➢ *Matematika, dizayn va texnologiyalar*

Dizayn va texnologiyalar o‘quvchilarga matematik bilim va ko‘nikmalarni bir qator hayotiy vaziyatlarda talqin qilish va ulardan foydalanish imkoniyatlarini beradi. O‘quvchilar sondan miqdoriy baholash va o‘lchash, statistikadan olgan natijalarini sharhlash va xulosa chiqarish uchun foydalanadilar. G‘oyalarni ishlab chiqarish jarayonida o‘lchaydilar va sonlar yordamida qayd etadilar. G‘oyalarni ishlab chiqish, takomillashtirish va sinash hamda loyihalarni boshqarishda sonlardan foydalanadilar. Ular uch o‘lchamli modellardan foydalanadilar, aniq texnik chizmalar yaratadilar, raqamli modellar bilan ishlaydilar va eng yaxshi yechimlarni ishlab chiqishda va yaratishda, qaror qabul qilish jarayonlarida miqdoriy mulohaza yuritishdan foydalanadilar. Texnologiya fani orqali tarkib toptirilgan kompetensiyalar matematika fanini o‘qitish jarayonida o‘quvchilarni kasb-hunarga yo‘naltirish, ularning texnik ijodkorlik qobiliyatlarini rivojlantirish hamda ijodiy loyiha tayyorlash malakalarini shakllantirishda muhim ahamiyatga egadir.

➢ *Matematika va san’at*

Matematika va san’at uyg‘unligi qonuniyatlarni tushunish, o‘lchash, fazoviy tasavvur va fikrlash ustiga quriladi. Matematikada o‘quvchilar bu bilimlardan masalalar yechishda va modellashtirishda foydalanadilar. San’atda badiiy asarlarni yaratish, talqin qilish, tahlil qilish va o‘rganishda matematik bilimlar ham qo‘llanadi. Matematika va san’at o‘quvchilarga tabiiy va sun’iy muhitlarni o‘rganish, ularni kuzatish imkoniyatini beradi. O‘quvchilar matematik bilimlarini tasviriy, ovozli va kinestetik kabi san’at shakllari orqali uzatishlari mumkin. O‘quvchilarga muayyan san’at jarayonlari yoki amaliyotlaridan foydalanganda matematik tushunishni qo‘llash imkoniyati beriladi. Masalan, musiqada o‘quvchilar kompozitsiya tuzishda naqsh va algoritmlar haqidagi bilimlarni qo‘llashlari mumkin.

➢ *Matematika va ijtimoiy fanlar*

Matematika va ijtimoiy fanlar uyg‘unligi moliyaviy savodxonlik va tadqiqot ma’lumotlarini tahlil qilishga e’tibor beradi. Bu moliyaviy va biznes qarorlarini qabul qilish uchun moliyaviy menejment tamoyillarini tushunishni o‘z ichiga oladi.

Ona tili va adabiyot, xorijiy tillar orqali shakllantiriladigan kompetensiyalar matematika fanini o‘qitishda o‘quvchilarning ijodiy fikrlashini rivojlantirishda, o‘z qarashlarini yozma va og‘zaki ravishda ravon bayon etish malakalarini hosil qilishda, ilmiy atamalarni to‘g‘ri qo‘llash hamda bahs-munozaralar jarayonida erkin muloqot qilishga o‘rgatishda muhim o‘rin tutadi.

Tarix fani matematika fani bilan ham bevosita bog‘langan. Ilm-fan yutuqlarining ishlab chiqarish sohalari, iqtisodiy-ijtimoiy munosabatlarining rivojlanishi va atrof-muhit holatiga ta’sirini ko‘rsatishda tarixiy ma’lumotlarning ahamiyati kattadir. O‘quvchilar tarixiy va fuqarolik voqealari, rivojlanish haqidagi ma’lumotlarni o‘tmish va hozirgi kunning ma’nosini anglatish uchun raqamli va grafik shaklda ifodalash, izohlash, tahlil qilish va taqdim etishni o‘rganadilar. Xaritalarni tuzish va izohlashda o‘quvchilar kataklar, masshtab, masofa, maydon va proyeksiyalar bilan bog‘liq sonli tushunchalar bilan ishlaydilar.

III. MATEMATIKADAN O‘QUVCHILAR YUTUQLARINI BAHOLASH ASOSLARI

➢ *Baholash*

Baholash o‘quv jarayonining muhim va zaruriy tarkibiy qismi bo‘lib, u ta’limning joriy va yakuniy bosqichlarida o‘quvchilar faoliyati to‘g‘risidagi ma’lumotlarni to‘plash va tahlil qilish jarayonidan iborat.

Baholashning maqsadi, vazifalari, predmeti, obyekti, tamoyillari, usullari, shakllari va vositalari ta’lim jarayonining barcha subyektlari – maktab ma’muriyati, o‘qituvchilar, ota-onalar va o‘quvchilar uchun tushunarli bo‘lishi kerak.

Baholash tizimi yutuqlarni o‘lchash va o‘quv muammolarini diagnostika qilishning asosiy vositasidir. U ta’lim sifatini, uning jahon standartlariga muvofiqligini aniqlashga, o‘qitish strategiyasi va taktikasi hamda ta’lim sohasidagi zamonaviy vazifalar, ta’lim mazmunini va ta’limning kutilayotgan natijalarini baholovchi shakllarni takomillashtirish bo‘yicha asosiy qarorlarni qabul qilishga imkon beradi.

Baholash aslida olingan natijalar va rejalashtirilgan maqsadlarni o‘zaro bog‘lash jarayonidan iborat.

Baholash tizimi:

- o‘quvchining o‘quv materialini qay darajada muvaffaqiyatli egallaganligini yoki amaliy ko‘nikmalarni shakllantirganligini aniqlashga imkon berishi;
- kognitiv (o‘rganish) faoliyatning turli sohalarida o‘quvchilar muvaffaqiyatining dinamikasini (o‘zgarishini) ko‘rsatishi;
- o‘quvchilarni rag‘batlantiruvchi, rivojlantiruvchi, o‘z-o‘zini baholashga yordam beradigan mexanizmga asoslangan bo‘lishi;
- “o‘qituvchi – o‘quvchi”, “ota-ona – sinf rahbari”, “maktab ma’muriyat – o‘qituvchilar jamoasi” aloqalarini ta’minlashi lozim.

➢ *Formativ va summativ baholash*

Baholash formativ (shakllanuvchi) baholash yoki joriy baholash va summativ (jamlanuvchi) yoki oraliq (yakuniy) baholashni o‘z ichiga oladi.

Formativ baholash sinfda yoki uydagi ta’lim olish jarayonida bilim va ko‘nikmalarni o‘zlashtirish darajasini aniqlashga mo‘ljallangan. U har xil shakllarda olib boriladi, o‘qituvchi va o‘quvchiga o‘z faoliyatlarini tuzatishga, yuzaga kelishi mumkin bo‘lgan muammo va kamchiliklarni bartaraf etishga imkon beradi. Fotmativ baholar summativ, choraklik va yakuniy baholarni chiqarishda hisobga olinmaydi.

Formativ baholashda ishning mazmuni va to‘g‘riligi to‘g‘risida yozma yoki og‘zaki qayd qilib boriladi. Natijalar dastlab jurnalga qo‘yilmasligi mumkin. Bu holatda ular o‘quvchi bilan muhokama qilinadi va o‘qituvchining alohida tutgan daftariga qo‘yiladi. O‘quvchilar o‘qituvchining bu sharhlari asosida ishlarini qayta ko‘rib chiqadilar va xatolarini tuzatadilar. Shundan so‘nggina aniqlanshtirilgan baholar jurnalga qo‘yilishi mumkin.

Summativ baholash fanning yaxlit o‘quv bo‘limi mavzularini o‘rganish tugaganidan so‘ng shakllanishi lozim bo‘lgan bilim va ko‘nikmalarining o‘zlashtirish darajasini aniqlashga mo‘ljallangan.

Summmativ baholash testlar, nazorat ishi, loyiha ishi kabi baholash ishlarini bajarish natijalari bo‘yicha amalga oshiriladi. Summativ baholash uchun qo‘yilgan baholar fan bo‘yicha choraklik, yillik yakuniy baholarni belgilash uchun asos bo‘ladi.

Summativ baholash mezon asosida amalga oshgiriladi. Baholash mezonlari haqida o‘quv jarayonining barcha ishtirokchilari: o‘quvchilar, o‘qituvchilar, ota-onalarning oldindan xabarlari bo‘lishi lozim. Baholash mezonlari formativ baholashning ham ajralmas qismidir. Formativ baholashda baholash mezonlari o‘quv materialining (mavzu yoki bo‘limning) ma’lum bir qismiga yo‘naltiril-

gan bo‘lsa, summativ baholashda ular keng miqyosda qaraladi.

Mavzular blogi yoki bobni o‘rganish tugaganidan so‘ng o‘qituvchi summativ baholashni amalga oshiradi. Bunday ish endi baholash mezonlari yordamida amalga oshirilishi lozim bo‘ladi. Chorak davomida o‘qituvchi nazorat ishlari sonini rejalashtirishi kerak. Summativ baholashlar soni chorak davomida kamida ikkita bo‘lishi maqsadga muvofiq. Ushbu nazorat ishlari o‘quvchilarning berilgan mavzular blogi bo‘yicha bilim va ko‘nikmalarini baholash uchun tuzilgan topshiriqlardan iborat bo‘ladi. Nazorat ishlari standart talablari asosida o‘rganilgan bob mavzularining mazmunini iloji boricha to‘liq qamrab olishi shart. O‘qituvchi topshiriqlarni shunday tanlashi kerakki, ular faqat nazariy materialni o‘zlashtirish, ya’ni bilim darajasini emas, balki o‘quvchining o‘zlashtirgan bilimlarini qo‘llash darajasini ham tekshirishi lozim. Shuningdek, o‘quvchilar uchun mulohaza yuritishga doir uchinchi darajali topshiriqlar ham taklif etilishi lozim. Nazorat ishlari natijasida olingan baholar, keyingi darsda xatolar ustida ishlangandan so‘ng tuzatishlar bilan jurnalga qo‘yiladi.

Choraklik yakuniy baho o‘rtacha formativ baho va summativ baholar o‘rta arifmetigi sifatida chiqariladi. Yillik yakuniy baho esa 4 ta choraklik baho va loyiha ishi bahosi o‘rtachasi sifatida olinadi. Agar yil oxirida fan bo‘yicha imtihon (yoki yakuniy nazorat) ham ko‘zda tutilgan bo‘lsa, yillik baho choraklik baholar, loyiha ishi bahosi o‘rtachasi va imtihon (yoki yakuniy nazorat) bahosining o‘rta arifmetigi sifatida olinadi.

➢ *Summativ baholash topshiriqlari*

Summativ baholashni ta’lim muassasasi ma’muriyati tomonidan tuzilgan kommissiya tomonidan xolisona o‘tkazish tavsiya etiladi. Baholash muddatlari, mezonlari, topshiriqlar namunalari va baholash bo‘yicha yo‘riqlar oldindan tuzilib, o‘quvchilar va ularning ota-onalariga hamda dars beruvchi o‘qituvchilarga o‘quv yili boshida e’lon qilinishi lozim.

Summativ baholash ikki qismdan iborat bo‘lishi mumkin:

– *test topshirig‘i;*

– *yozma ish.*

Test topshirig‘i 45 minutga mo‘ljallangan bo‘lib, 15–25 ta testdan iborat qilib tuziladi.

Topshiriq quyidagi test turlaridan iborat bo‘lishi mumkin:

➢ to‘rtta javob variantli, bitta to‘g‘ri javobli yopiq test;

➢ to‘rttadan ko‘p javob variantli, bir nechta to‘g‘ri javobli yopiq test;

➢ to‘rtta savolga to‘rtta to‘g‘ri javobni mos qo‘yadigan yopiq test;

➢ har biriga “to‘g‘ri” yoki “noto‘g‘ri” deb javob beriladigan, to‘rtta savoldan iborat yopiq test;

➢ qisqa javobli ochiq test (faqat javobini yozish so‘raladigan masala yoki savol).

Test topshirig‘i odatda o‘quvchilarning 1- va 2-darajadagi o‘zlashtirish darajasiga erishganligini aniqlash uchun o‘tkaziladi. Shunga mos ravishda har bir test savoli 1 yoki 2 ball bilan baholanadi.

Yozma ish esa batafsil javobli ochiq test, ya’ni batafsil yechishga mo‘ljallangan to‘laqonli matematika masalalaridan iborat qilib tuziladi. Yozma ish odatda 45 minutga mo‘ljallangan bo‘lib, u quyidagi mazmundagi 3 ta masaladan iborat qilib tuzilishi tavsiya etiladi:

➢ algebraga doir algoritm asosida yechiladigan misol yoki hisoblashga doir masala;

➢ algebraik mulohaza yuritishga doir misol yoki masala;

➢ hayotiy vaziyatga doir muammoning matematik modelini tuzish va uni yechishga doir masala.

Yozma ish odatda o‘quvchilarning 2- va 3-darajadagi o‘zlashtirish darajasiga erishganligini aniqlash uchun o‘tkaziladi. Yozma ishni baholash mezonlari uning har bir masalasi uchun alohida tuziladi va ballar masalalarning murakkablik darajasidan kelib chiqib o‘zaro taqsimlanadi. Quyida yozma ishini baholash mezonlari va ularga mos maksimal ballar keltirilgan:

Baholash mezoni	Ball
Topshiriqlar mantiqiy fikrlab, xatosiz va kamchiliklarsiz yechilgan har qanday yechim; rasmlar, chizmalar va grafiklarni javobga mos ravishda to‘g‘ri bajarganda	5
Masala asoslab to‘liq yechilgan bo‘lsa, lekin 1–2 ta qo‘pol bo‘lmagan xatolar va hisoblashlarda yo‘l qo‘yilgan mayda kamchiliklar uchun.	4
Topshiriq asoslab to‘liq yechilmagan bo‘lsa, lekin 3–4 ta qo‘pol bo‘lmagan xatolar va hisoblashlarda yo‘l qo‘yilgan kamchiliklar bo‘lganda.	3
Mavzu bo‘yicha berilgan topshiriq bajarilmagan bo‘lsa	2

Loyiha ishini baholash mezonlari

Loyiha ishi haqida yuqorida batafsil ma’lumot berildi. O‘quvchilarning loyiha ishi bo‘yicha faoliyati birgalikda baholanadi. Loyiha ishi ham 100 balli tizimda baholanadi va yuqoridagi shkala yordamida baholarga o‘tkaziladi. Har bir o‘quvchiga loyiha ishi uchun umumiy baho qo‘yiladi. Quyida loyiha ishini baholash mezonlari va ularga mos maksimal ballar keltirilgan:

№	Baholash mezonlari	Ballar
1.	Loyiha ishida o‘rganilgan muammolarning ahamiyatliligi va dolzarbligi hamda o‘rganilayotgan mavzuga mosligi	5
2.	Tuzilgan matematik modelning o‘rganilayotgan muammoga mosligi	10
3.	Foydalanilgan tadqiqot usullari va olingan natijalarni qayta ishlash usullarining muammoni o‘rganishga muvofiqligi	20
4.	Muammoga zaruriy va yetarlicha chuqur kirish, boshqa sohalardan bilimlarni jalb etish imkoniyatlaridan foydalanganlik	20
5.	Oraliq va yakuniy xulosalarning asoslanganligi, natijalarning muammo yechimiga yaqinligi	10
6.	Loyiha ishtirokchilarining hamkorlikdagi faolligi	10
7.	Bajarilgan loyiha natijalarini rasmiylashtirish sifati	5
8.	Taqdimot sifati, taqrizchilar savollariga javob bera olish, guruhdagi har bir ishtirokchining javoblari asoslanganligi	20
	Jami	100

5-SINFDA O‘TILGANLARNI TAKRORLASH

Natural sonlar ustida amallar

1. Hisoblang.

a) 65 772 + 34 228 = 100 000
b) 172 338 + 327 662 = 500 000
c) 8 900 307 + 1 099 693 = 10 000 000
d) 8 364 579 − 1 635 421 = 6 729 158
e) 1 205 620 − 1 076 799 = 128 821
f) 5 645 789 − 3 214 658 = 2 431 131
g) 669 023 × 7 = 4 683 161
h) 27 613 × 26 = 717 938
i) 9 600 696 ÷ 84 = 114 294
j) 11 682 000 ÷ 125 = 93 456

2. Omborda 2 414 quti pomidor bor edi. Birinchi kuni 735, ikkinchi kuni 813 va uchinchi kuni esa 756 quti pomidor sotildi. Omborda necha quti pomidor qoldi?

Agar har bir qutidagi pomidorlar og‘irligi 18 kg bo‘lsa, 3 kunda necha kilogramm pomidor sotilgan?

Qaysi kunda kamroq pomidor sotilgan? Eng ko‘pi-chi?

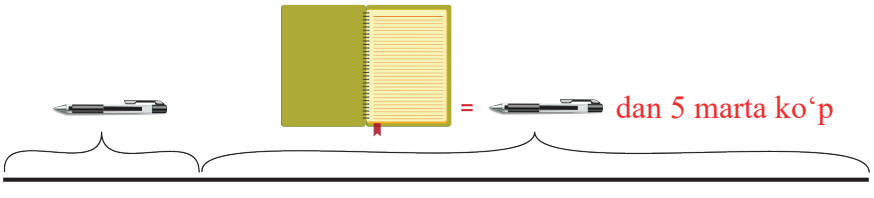
Yechish:

1) Omborda 2414 – 735 – 813 – 756 = 110 quti pomidor qoldi.
2) 3 kunda 18 × (735 + 813 + 756) = 41 472 kg pomidor sotilgan.
3) 1-kuni kamroq, 2-kuni ko‘proq pomidor sotilgan. Qutilardagi pomidorlar og‘irligini topish shart emas. Chunki har bir qutidagi pomidorlar 18 kilogrammdan.

3. Ifodalarning qiymatini toping.

a) 69 ÷ 23 + 45 × (896 − 15 × 32) = 18 723
b) 788 − 414 ÷ 18 + 768 ÷ 12 × 4 = 1 021
c) 54 × 286 − 589 ÷ 19 + 48 + 658 − 98 = 16 021
d) 96 × (4 508 ÷ 98 + 3 534 ÷ 38) − 156 = 13 188

4. O‘quvchi 65 000 so‘mga ruchka va daftarlar sotib oldi. Bir dona daftarning narxi 2 000, ruchka esa 3 000 so‘m turadi. O‘quvchi nechta daftar va ruchka sotib olgan?



Yechish:

Ruchka x dona, daftar $5x$ dona
$3\,000x + 5x \times 2\,000 = 65\,000$
$3\,000x + 10\,000x = 65\,000$
$13\,000x = 65\,000$
$x = 65\,000 \div 13\,000$
$x = 5$

Ruchka 5 dona, daftar $5 \times 5 = 25$ dona
Tekshirish: $5 \times 3\,000 + 25 \times 2\,000 = 65\,000$

5. 2, 9, 3, 6 va 0 raqamlaridan foydalanib eng katta va eng kichik 5 xonali sonlarni hosil qiling. Hosil bo‘lgan sonlarning kattasidan kichigini ayiring.

Yechish: 2, 9, 3, 6 va 0 raqamlaridan hosil qilish mumkin bo‘lgan eng katta 5 xonali son 96 320, eng kichik 5 xonali son 20 369. Ularning ayirmasi: 96 320 – 20 369 = 75 951

6. Mustafo 14 yoshda, uning 1 yoshli Iymona va 4 yoshli Soliha ismli singlisi bor. Necha yildan keyin Iymona va Solihaning yoshlari yig‘indisi Mustafoning yoshiga teng bo‘ladi?

Yechish: $14 + x = (x + 1) + (x + 4) \Rightarrow 14 + x = 2x + 5 \Rightarrow x = 9$
Javob: 9 yildan keyin.

7. Harflarga mos raqamlarni toping.
Javoblar: A = 0, B = 8, C = 7, E = 8, F = 1, D = 0, J = 2, K = 3, L = 5, X = 2, Y = 4.

$$\begin{array}{r} 2\ A\ 3\ 4 \\ 7\ 3\ B \\ +\ 6\ C\ 7 \\ \hline 3\ 4\ 4\ 9 \end{array} \qquad \begin{array}{r} 8\ 7\ D\ 4\ 3 \\ -\ 7\ 9\ 2\ E \\ \hline 7\ 9\ 1\ F\ 5 \end{array} \qquad \begin{array}{r} J\ K\ L \\ \times\ 4 \\ \hline 9\ 4\ 0 \end{array} \qquad \begin{array}{r} 2\ 1\ 5 \\ \times\ X\ Y \\ \hline 8\ 6\ 0 \\ +\ 4\ 3\ 0 \\ \hline 5\ 1\ 6\ 0 \end{array}$$

8. Fermada tovuq, echki va sigir bor. Barcha hayvonlarning boshi 19 ta, oyoqlari esa 56 ta. Fermada nechta tovuq bor?

Yechish: tovuqlar soni: x ta
Echki va sigirlar soni: $19 - x$
Tovuqda 2 ta, echki va sigirda 4 tadan oyoq bor. Jami oyoqlar soni 56 ta.
Tenglama tuzamiz: $2x + 4(19 - x) = 56$
$2x + 76 - 4x = 56$
$2x = 20$
$x = 10$ **Javob:** 10 ta tovuq bor.

9. Jadvalda bir hafta ichida futbol stadioniga tashrif buyurganlar soni keltirilgan. Berilgan ma’lumotlarni ko‘rib chiqing va quyidagi savollarga javob bering.

Agar stadionga kirish chiptasi narxi 10 000 so‘m bo‘lsa, seshanba kuni qancha pul yig‘ilgan?

Hafta davomida stadionga kelgan tomoshabinlarning umumiy soni nechta?

Shanba kuni chorshanbaga qaraganda nechta ko‘p tomoshabin bor edi?

Kunlar	Tomoshabinlar soni
Dushanba	21 587
Seshanba	15 721
Chorshanba	16 040
Payshanba	13 674
Juma	22 876
Shanba	26 330
Yakshanba	25 889

Yechish:
Umumiy tomoshabinlar soni:
21 587 + 15 721 + 16 040 + 13 674 + 22 876 + 26 330 + 25 889 = 142 117
Seshanba kuni yig‘ilgan pul:
15 721 × 10 000 = 157 210 000
Shanba kuni chorshanbadan ko‘proq tomoshabin: 26 330 – 16 040 = 10 290

10. 39 ni bo‘lganda qoldiq 9 chiqadigan barcha natural sonlarning yig‘indisini toping.

Yechish:
$39 \div 10 = 3$ (9 qoldiq), $39 \div 15 = 2$ (9 qoldiq), $39 \times 30 = 1$ (9 qoldiq)
$10 + 15 + 30 = 55$. **Javob:** 55

11. Harflarga mos raqamlarni toping.

Javob: A = 8, B = 0, C = 4, E = 3, F = 4, E = 2, G = 5, T = 4, O = 2, N = 7, M = 6, L = 1, X = 3, Z = 9

$$\begin{array}{r} 5\ 0\ A\ 9 \\ 2\ 4\ 5\ B \\ +\quad C\ 2\ 7 \\ \hline 7\ 9\ 6\ 6 \end{array} \qquad \begin{array}{r} 6\ D\ 4\ 9\ E \\ -\quad 8\ 1\ F\ 5 \\ \hline G\ 5\ 3\ 4\ 7 \end{array} \qquad \begin{array}{r} 2\ 2\ 4 \\ \times\quad 3\ T \\ \hline 8\ 9\ 6 \\ +\ M\ N\ O \\ \hline N\ M\ L\ 6 \end{array} \qquad \begin{array}{r} 2\ 3\ X \\ \times\quad X\ 4 \\ \hline Z\ 3\ 2 \\ +\ 6\ 9\ 9 \\ \hline 7\ 9\ 2\ 2 \end{array}$$

12. Bir hafta mobaynida uchta tumanda haydovchilardan qoidabuzarliklar uchun 23 875 500 so‘m jarima undirildi. Birinchi tumanda 9 823 000, ikkinchisida 11 575 000 so‘m jarima undirilgan bo‘lsa, uchinchi tumanda qancha jarima undirilgan?

Javob: 23 875 500 – 9 823 000 – 11 575 000 = 2 477 500 so‘m

Tub va murakkab sonlar. EKUB va EKUK

1. Sonning natural bo‘luvchilarini toping: 48; 36; 69; 75; 79; 91.

Yechish:

48 → 1, 2, 3, 4, 6, 8, 12, 16, 24, 48 36 → 1, 2, 3, 4, 6, 9, 13, 18, 36

75, 79, 91 sonlaring umumiy bo‘luvchilari ham shu tartibda topiladi.

2. Quyidagi sonlardan qaysi biri 2; 3; 4; 5; 6; 8; 9; 10; 11 ga qoldiqsiz bo‘linadi?

32 **12** **58** **40** **55**

Yechish: sonlarning bo‘linish belgilariga asoslanamiz.
32 → 2, 4, 8 sonlariga qoldiqsiz bo‘linadi. 12 → 2, 3, 4, 6 sonlariga qoldiqsiz bo‘linadi.

3. Quyidagi sonlardan qaysilari 2 ga, 3 ga yoki 5 ga bo‘linadi? Ular ichida bir vaqtda 2, 3 va 5 ga bo‘linadigan sonlar bormi?

250 840 525 4686 480

Yechish: 250 soni 2 ga, 5 ga qoldiqsiz bo‘linadi. 840 soni bir vaqtda 2 ga, 3 ga, 5 ga bo‘linadi. 525 soni 3 ga, 5 ga bo‘linadi. 4686 soni 2 ga, 3 ga bo‘linadi. 480 bir vaqtda 2 ga, 3 ga, 5 ga bo‘linadi.

4. Quyidagi sonlar orasidagi o‘zaro tub sonlarni ajratib, yozing.
a) 25 dan 48 gacha b) 28 dan 42 gacha c) 58 dan 75 gacha

Yechish: biz faqat ketma-ket kelgan 2 ta natural sonni tanlaymiz. Eslang: har qanday ketma-ket kelgan 2 ta natural son o‘zaro tub son.

Agar o‘quvchilar qiyinchiliksiz bajarsa, 3 ta o‘zaro tub bo‘lgan natural sonni topishlarini ayting. Masalan: (25, 27, 29). Bundan tashqari, a) 29, 31, 37, 41, 43, 47; b) 29, 31, 37, 41; c) 59, 61, 67, 71; d) 7, 9, 11, 13, 17, 19, 23, 29 o‘zaro tub sonlarni topshilari kerak.

5. Hisoblang.

a) EKUB (15; 25; 37) = 1

b) EKUK (8; 12; 20) = 120

c) EKUK (60; 90; 30) = 180

Ko‘rsatma: EKUBni topishning boshqa usullarini eslating.

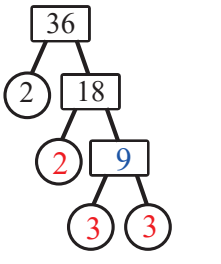
6. Maktab bo‘yicha 6-sinfda 60 nafar qiz va 72 nafar o‘g‘il bola bor. Bolalar nechta guruhga bo‘linsa, ular teng taqsimlanadi? Nechta guruh yaratishingiz mumkin? Har bir guruhda nechta qiz va o‘g‘il bola bo‘ladi?

Javob: EKUB(60; 72) = 12 ta guruh yaratish mumkin.

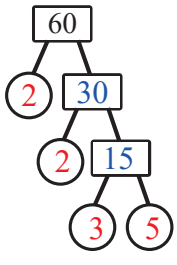
7. Davronda 12 ta, Rustamda esa 18 ta shokolad bor. Ularning har biri shokoladlarni do‘stlari bilan baham ko‘rdi. Agar Davron va Rustam bir xil miqdordagi shokolad berishsa, ularning har bir do‘sti nechta shokolad oladi?

Javob: 6 tadan shokolad oladi.

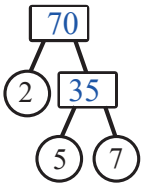
8. Quyidagi “ko‘paytuvchilar daraxti”ni to‘ldiring.



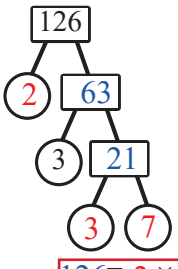
36= 2 × 2 × 3 × 3



60= 2 × 2 × 3 × 5



70 = 2 × 5 × 7



126= 2 × 3 × 3 × 7

9. Shu usuldan foydalanib 18; 76; 55; 100; 69; 41 sonlarini ham tub ko‘paytuvchilarga ajrating.

Ko‘rsatma: dastlab 8-misoldan foydalanib, keyin esa “ustun” shaklida tub ko‘paytuvchilarga ajratish tavsiya etiladi.

10. Quyidagi sonlardan qaysi biri 2; 3; 4; 5; 6; 8; 9; 10; 11 ga bo‘linadi?

a) 698 247 → 3; 9; 11 ga bo‘linadi

b) 4 632 → 2; 3; 4; 6; 8 ga bo‘linadi

c) 9 030 → 2; 3, 5; 6; 10 ga bo‘linadi

d) 654 921 → 3; 9 ga bo‘linadi

Bir xil maxrajli kasrlarni qo‘shish va ayirish

1. Hisoblang.

a) $\frac{3}{8}+\frac{2}{8}=\frac{3+2}{8}=\frac{5}{8}$

b) $\frac{3}{10}+\frac{5}{10}=\frac{3+5}{10}=\frac{8}{10}$

c) $\frac{24}{50}+\frac{17}{50}=\frac{24+17}{50}=\frac{41}{50}$

d) $\frac{38}{124}+\frac{45}{124}=\frac{38+45}{124}=\frac{83}{124}$

2. Ayirmalar nimaga teng? Natijalarni taqqoslang.

a) $\frac{10}{12}-\frac{5}{12}=\frac{10-5}{12}=\frac{5}{12}$

b) $\frac{7}{8}-\frac{5}{8}=\frac{7-5}{8}=\frac{2}{8}$

c) $\frac{21}{37}-\frac{14}{37}=\frac{21-14}{37}=\frac{7}{37}$

d) $\frac{51}{256}-\frac{39}{256}=\frac{51-39}{256}=\frac{12}{256}$

3. 1-probirkada $\frac{5}{25}$ litr suv bor. Undan $\frac{2}{25}$ litr suv 2-probirkaga quyildi. 1-probirkada qancha suv qolgan? Agar unga yana $\frac{4}{25}$ litr suv quyilsa, probirkada qancha suv bo‘ladi?

Yechish. 1-probirkada qolgan suv miqdori: 1) $\frac{5}{25}-\frac{2}{25}=\frac{3}{25}$ 2) $\frac{3}{25}+\frac{4}{25}=\frac{7}{25}$

4. Ifodalarning qiymatini toping.

a) $\frac{15}{29}-\left(\frac{27}{29}-\frac{22}{29}\right)+\frac{11}{29}=\frac{15}{29}-\frac{5}{29}+\frac{11}{29}=\frac{15-5+11}{29}=\frac{21}{29}$

b) $\left(\frac{19}{92}-\frac{12}{92}+\frac{62}{92}\right)-\frac{43}{92}=\frac{69}{92}-\frac{43}{92}=\frac{26}{92}$

c) $\left(\frac{43}{88}+\frac{37}{88}\right)-\left(\frac{76}{88}-\frac{52}{88}\right)=\frac{80}{88}-\frac{24}{88}=\frac{56}{88}$

d) $\frac{43}{62}-\frac{26}{62}+\frac{34}{62}-\frac{19}{62}+\frac{23}{62}=\frac{43-26+34-19+23}{62}=\frac{55}{62}$

5. Barno texnologiya darsida ikki xil pishiriq tayyorladi. 1-pishiriq uchun 1,75 stakan, 2-pishiriq uchun 0,25 stakan shakar ishlatdi. Barno hammasi bo‘lib qancha shakar ishlatgan?

Yechish: 1,75 + 0,25 = 2 **Javob:** 2 stakan.

6. O‘rmon 33 km² maydonga yoyilgan edi. Yong‘inlar va sanoat korxonalari tufayli u qisqarib, 16,5 km² bo‘lib qoldi. O‘rmon qancha qismga qisqargan? O‘rmonlarni himoya qilish uchun qanday choralar ko‘rish mumkin?

Yechish: 33 – 16,5 = 16,5 **Javob:** 16,5 km².

O‘rmonlarni himoya qilish bo‘yicha suhbat uyushtiriladi.

7. Hisoblang.

a) $6\frac{2}{7}-5\frac{1}{7}=(6-5)+\frac{2}{7}-\frac{1}{7}=1\frac{1}{7}$

b) $2\frac{4}{10}+5\frac{5}{10}=7\frac{9}{10}$

c) $4\frac{7}{8}-2\frac{4}{8}=2\frac{3}{8}$

d) $1\frac{2}{8}+1\frac{1}{8}=2\frac{3}{8}$

8. Hisoblang.

a) 15,25 + 60,98 + 10,50 = 86,73

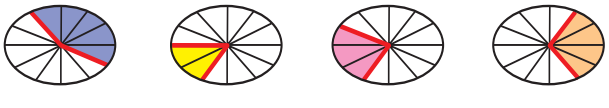
b) 19,405 + 20,210 + 8,100 = 47,715

c) 143,210 – 89,025 = 54,185

d) 1001,002 – 975,350 = 25,652

9. Rasmdagi mantiqiy bog‘liqlikni aniqlab, keyingi mos keluvchi shaklni toping.

$\frac{5}{12},\frac{2}{12},\frac{3}{12},\frac{4}{12}$ *Javob:* *b*) $\frac{1}{12}$





10. Berilgan kvadratni to‘ldiring. Barcha satr va ustunlar yig‘indisi 9,0 ga teng bo‘lsin.

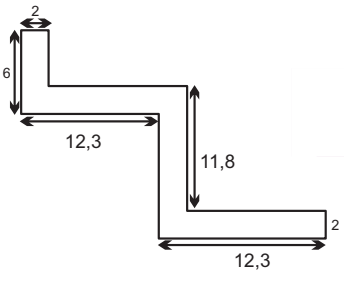
3,4	2,0	3,6	9
1,8	3,0	4,2	9
3,8	4,0	1,2	9
9	9	9	

11. Hisoblang.

a) $\frac{17}{42}-\left(\frac{39}{42}-\frac{28}{42}\right)+\frac{23}{42}=\frac{17}{42}-\frac{11}{42}+\frac{23}{42}=\frac{29}{42}$

b) $\left(\frac{48}{74}+\frac{17}{74}-\frac{26}{74}\right)-\frac{23}{74}=\frac{39}{74}-\frac{23}{74}=\frac{16}{74}$

12. Rasmda keltirilgan yo‘lakni 2 metr kenglikdagi gilam bilan qoplash uchun gilamning uzunligi necha metr bo‘lishi kerak?



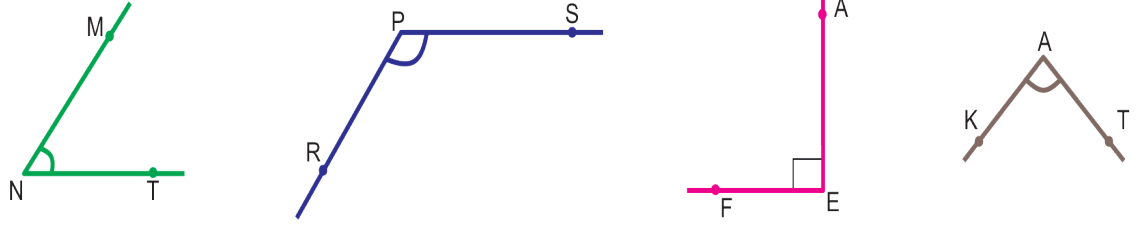
Yechish: (6 – 2) + (12,3 – 2) + (11,8 – 2) + (12,3 – 2) = 34,4 m.

13. Hisoblang.

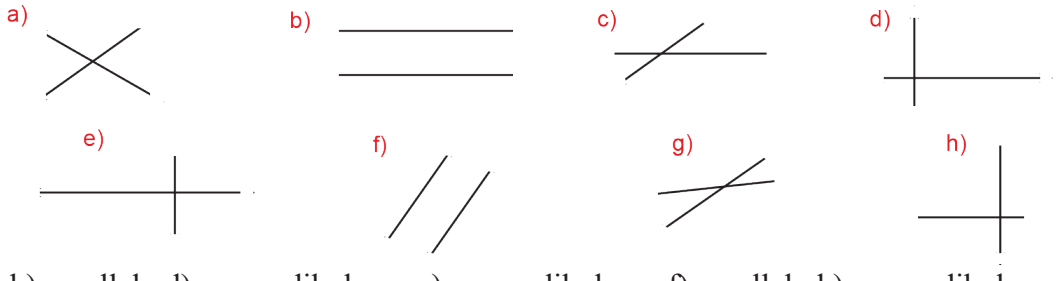
a) 23,17 + 21,83 + 0,5 = 45,5
b) 21,75 + 17,25 – 0,17 = 38,83
c) 75,140 + 24,860 = 100
d) 22,01 – 15,45 = 6,56

Geometrik shakl va o‘lchashlar

1. Transportir yordamida burchaklarni o‘lchang.

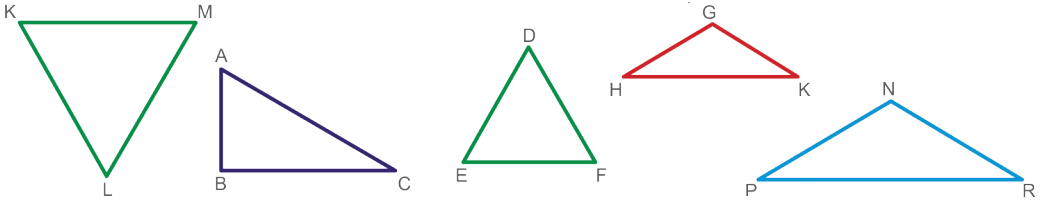


2. Parallel va perpendikulyar to‘g‘ri chiziqlarni aniqlang.



b) parallel d) perpendikulyar e) perpendikulyar f) parallel h) perpendikulyar

3. Chizg‘ich va transportirdan foydalanib uchburchakning turi va burchaklarini toping.

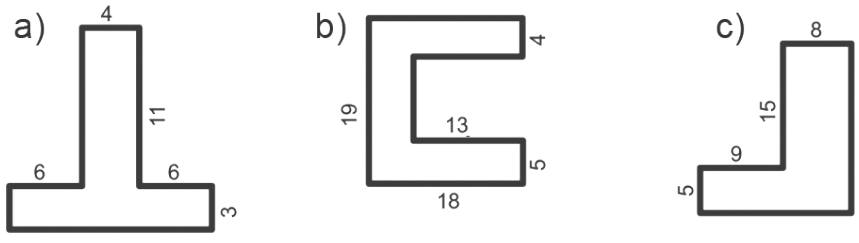


4. Shakllar yuzasini toping.

a) $11 \times 4 + (6 + 6 + 4) \times 3 = 44 + 48 = 92$

b) $18 \times 5 + 4 \times 18 + (19 - 5 - 4) \times (18 - 13) = 90 + 72 + 50 = 212$

c) $5 \times 9 + (15 + 5) \times 8 = 45 + 160 = 205$

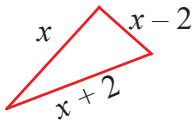


5. Uchburchakning bir tomoni ikkinchisidan 2 cm qisqa, uchinchi tomonidan 2 cm uzunroq. Uchburchak perimetri 27 cm ga teng bo‘lsa, uning tomonlari uzunliklarini aniqlang.

$x + x + 2 + x - 2 = 27$

$3x = 27$

$x = 9 \qquad x_1 = 9 + 2 = 11 \qquad x_2 = 9 - 2 = 7$

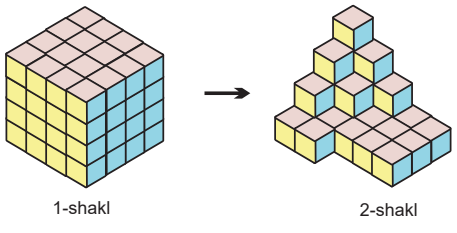


6. 1-shakldagi kubdan nechta kichik kubchalarni olib tashlasak, 2-shakldagi jism hosil bo‘ladi?

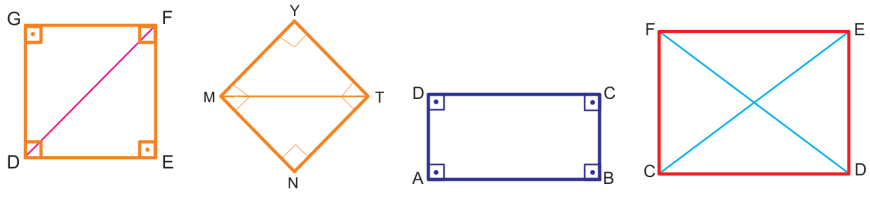
1-shaklda 64 ta kubcha bor.

2-shaklda 27 ta kubcha bor.

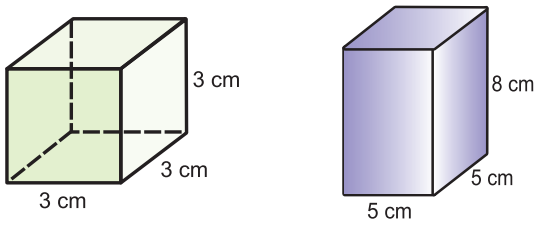
64 – 27 = 37 kubcha olingan.



7. Chizg‘ich yordamida to‘g‘ri to‘rtburchak va kvadratlarning tomonini o‘lchab, yuzini toping.



8. To‘g‘ri burchakli parallelepiped va kublarning to‘la sirti yuzi va hajmini toping.



a) $V = 3 \times 3 \times 3 = 27\ \text{cm}^3$

b) $V = 5 \times 5 \times 8 = 200\ \text{cm}^3$

c) $V = 3 \times 4 \times 1 = 12\ \text{cm}^3$

$S_{\text{to‘la}} = 6 \times 3^2 = 54\ \text{cm}^2$

$S_{\text{to‘la}} = 2 \times (5 \times 5 + 5 \times 8 + 5 \times 8) = 210\ \text{cm}^2$

$S_{\text{to‘la}} = 2 \times (3 \times 4 + 3 \times 1 + 4 \times 1) = 38\ \text{cm}^2$

9. ABCD to‘rtburchakning AB tomoni 45 cm, BC tomoni undan 23 mm uzun, CD tomoni BC tomonidan 1 cm 2 mm qisqa, AD tomoni esa CD tomonidan 56 mm uzun. ABCD to‘rtburchakning perimetrini toping.

Yechish: barcha tomonlarni millimetrga o‘tkazamiz.

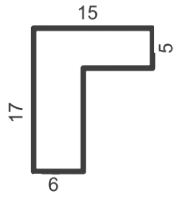
AB = 45 cm = 450 mm BC = AB + 23 mm = 450 + 23 = 473 mm
CD = 473 – 12 = 461 mm AD = 461 + 56 = 517 mm
P = 450 + 473 + 461 + 517 = 1901 mm

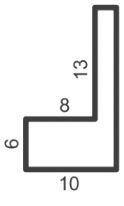
10. Munosabatlarni o‘rnating.

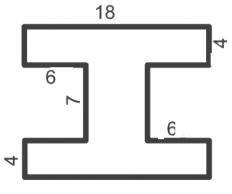
a) 4 ha = 40 000 m^2 b) 20 ha = 200 000 m^2 c) 5 ha = 50 000 m^2
d) 15 ha = 150 000 m^2 e) 1 km^2 = 100 ha f) 15 km^2 = 1 500 ha
g) 1000 km^2 = 100 000 ha h) 75 000 m^2 = 7,5 ha i) 250 km^2 = 25 000 ha

11. Shakllarning perimetri va yuzini toping.

a) $S = 12 \times 6 + 15 \times 5 = 147$ $P = 15 + 5 + 17 + 6 = 43$
b) $S = 6 \times 10 + 2 \times 13 = 86$ $P = 6 + 8 + 13 + 10 + 2 + 19 = 58$
c) $S = 18 \times 4 \times 2 + 6 \times 7 = 186$ $P = 18 \times 2 + 4 \times 4 + 6 \times 4 + 7 \times 2 = 90$

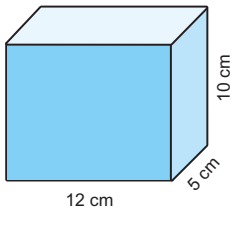


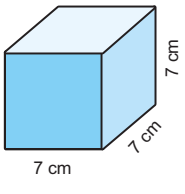


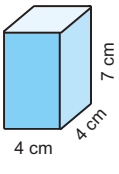


12. Fazoviy shakllarning to‘la sirti yuzi va hajmini toping.

a) $V = 12 \times 5 \times 10 = 600$ cm^3 $S_{to‘la} = 12 \times 5 \times 2 + 12 \times 10 \times 2 + 5 \times 10 \times 2 = 460$ cm^2
b) $V = 7 \times 7 \times 7 = 343$ cm^3 $S_{to‘la} = 7 \times 7 \times 6 = 294$ cm^2
c) $V = 4 \times 4 \times 7 = 112$ cm^3 $S_{to‘la} = 4 \times 4 \times 2 + 4 \times 7 \times 4 = 144$ cm^2





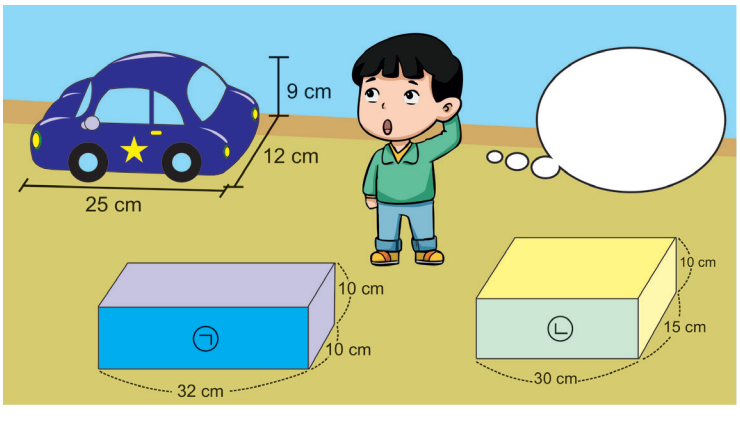


13. Siz o‘yinchoq mashinani qaysi qutiga joylagan bo‘lar edingiz?

Yechish:

1-quti hajmi: 32 × 10 × 10 = 3200 cm^3 2-quti hajmi: 30 × 15 × 10 = 4500 cm^3
Mashina hajmi: 25 × 12 × 9 = 2700 cm^3

O‘quvchilar dastlab shakllarning hajmini o‘lchaydilar ikkala qutiga ham mashina joylasa bo‘ladi degan xulosa berishlari mumkin. Lekin 1-qutiga mashina sig‘maydi. Sababi 1-qutining eni 10 cm, mashinaniki esa 12 cm.



I BOB. KASRLARNI QO‘SHISH VA AYIRISH

Teng kasrlar

Barcha o‘quvchilar	$\frac{2}{3}=\frac{4}{6}=\frac{*}{9}=\frac{8}{*}$ ko‘rinishidagi misollarni yechadi.
Aksariyat o‘quvchilar	Istalgan kasrga teng bo‘lgan bir nechta kasr yozadi.
Ba’zi o‘quvchilar	$\frac{4}{5}=\frac{16}{x+7}$ ko‘rinishidagi tenglamalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Yarimga qaysi kasr mos keladi?
2. Chorakka qanday kasr mos keladi?
3. 1 ga teng nechta kasr ayta olasiz?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrning surat va maxrajini bir xil songa ko‘paytirib, unga teng kasr hosil qilishda faqat surati yoki faqat maxrajini o‘sha songa ko‘paytirib qo‘yishadi. Bunday holatning oldini olish uchun o‘qituvchi o‘quvchilarga mavzuni tushuntirayotganda bu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uyga vazifa*

13-, 14-15-misollar (19-, 20-betlar)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Bo‘sh kataklarni to‘ldiring.

$\frac{2}{3}=\frac{4}{6}=\frac{\square}{9}=\frac{8}{\square}=\frac{\square}{\square}=\ldots$ $\qquad$ $\frac{3}{4}=\frac{\square}{\square}=\frac{\square}{\square}=\frac{\square}{\square}=\frac{\square}{\square}=\ldots$

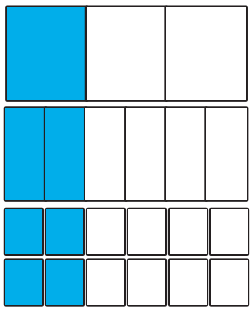
Javob: $\frac{2}{3}=\frac{4}{6}=\frac{6}{9}=\frac{8}{12}=\frac{10}{15}=\frac{12}{18}=\frac{14}{21}=\ldots\ldots$ $\qquad$ $\frac{3}{4}=\frac{6}{8}=\frac{9}{12}=\frac{12}{16}=\frac{15}{20}=\ldots$

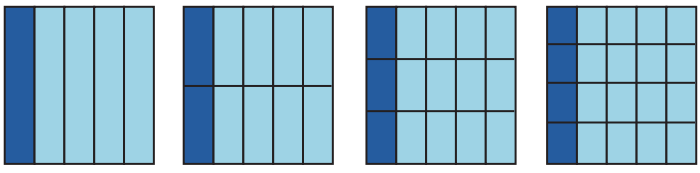
2. Noma’lum sonlarni toping.

$a)\ \frac{3}{4}=\frac{15}{20}$ $\qquad$ $b)\ \frac{2}{3}=\frac{8}{12}$ $\qquad$ $c)\ \frac{5}{9}=\frac{20}{36}$ $\qquad$ $d)\ \frac{9}{11}=\frac{45}{55}$

3. Bo‘yalgan sohalarni teng kasrlarda ifodalang.

$a)\ \frac{1}{3},\ \frac{2}{6},\ \frac{4}{12}$ $\qquad$ $b)\ \frac{1}{5},\ \frac{2}{10},\ \frac{3}{15},\ \frac{4}{20}$





5. Yulduzcha o‘rniga mos sonni toping.

$a)\ \frac{5}{7}=\frac{10}{14}$ $b)\ \frac{1}{3}=\frac{8}{24}$ $c)\ \frac{6}{7}=\frac{18}{21}$ $d)\ \frac{3}{10}=\frac{15}{50}$

6. Surati $\frac{5}{9}$ kasrning suratidan katta, ammo shu kasrga teng to‘rtta kasr yozing.

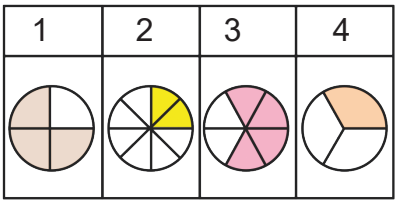
Javob: $\frac{5}{9}=\frac{10}{18}=\frac{15}{27}=\frac{20}{36}=\frac{25}{45}=\frac{30}{54}$

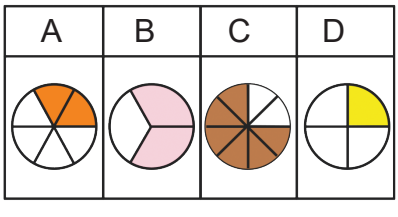
7. Maxraji $\frac{2}{7}$ kasrning maxrajidan katta, ammo shu kasrga teng to‘rtta kasr yozing.

Javob: $\frac{2}{7}=\frac{4}{14}=\frac{8}{28}=\frac{16}{56}=\frac{32}{112}$

8. Teng kasrlarni ifoda etuvchi mosliklarni toping.

$1-c,\ \ 2-d,\ 3-b,\ \ 4-a$





9. Kasrning asosiy xossasidan foydalanib quyidagi kasrlarga teng bo‘lgan uchtadan kasr yozing.

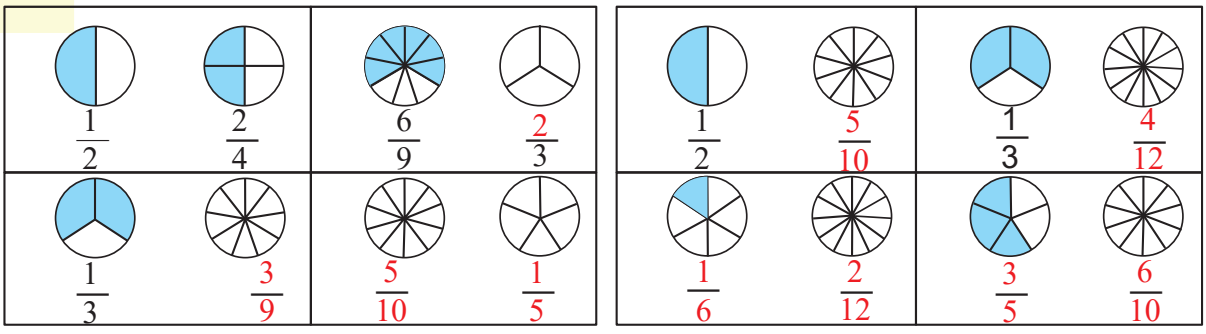
$a)\ \frac{2}{5}=\frac{4}{10}=\frac{8}{20}=\frac{16}{40}$ $b)\ \frac{4}{7}=\frac{8}{14}=\frac{16}{28}=\frac{32}{56}$

$c)\ \frac{5}{8}=\frac{10}{16}=\frac{15}{24}=\frac{20}{32}$ $d)\ \frac{3}{4}=\frac{6}{8}=\frac{9}{12}=\frac{15}{16}$

10. $\frac{3}{5}$ kasrni maxraji 15; 25; 35; 55 va 65 ga teng bo‘lgan kasr shaklida yozing.

Javob: $\frac{3}{5}=\frac{9}{15}=\frac{15}{25}=\frac{21}{35}=\frac{33}{55}=\frac{39}{65}$

11. Namuna asosida bo‘sh kataklarni to‘ldiring va kasrlarning tengligini tekshiring.
Eslatma: aylanalardagi bo‘laklar soniga e’tibor bering!



12*. Tenglamani yeching.

$a)\ \frac{4}{5}=\frac{16}{13+7}$ $b)\ \frac{10}{13}=\frac{12+8}{26}$ $c)\ \frac{11}{15}=\frac{33}{29+16}$ $d)\ \frac{14}{17}=\frac{2\times15+12}{51}$

13. Kasrning asosiy xossasidan foydalanib quyidagi kasrlarga teng bo‘lgan uchtadan kasr yozing.

a) $\frac{6}{7}=\frac{12}{14}=\frac{18}{21}=\frac{24}{28}=\frac{30}{35}$

b) $\frac{4}{11}=\frac{8}{22}=\frac{12}{33}=\frac{16}{44}$

c) $\frac{8}{9}=\frac{16}{18}=\frac{24}{27}=\frac{32}{36}$

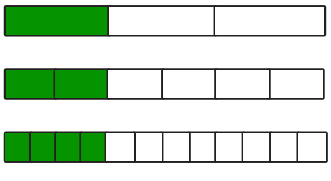
d) $\frac{3}{13}=\frac{6}{26}=\frac{9}{39}=\frac{12}{42}$

14. Bo‘yalgan sohalarni teng kasrlarda ifodalang.

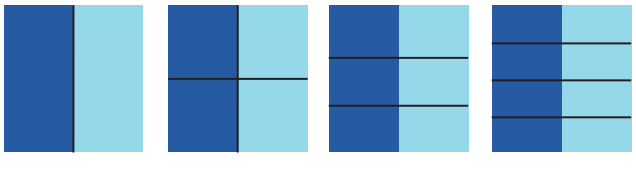
a) $\frac{1}{3}=\frac{2}{6}=\frac{4}{12}$

b) $\frac{1}{2}=\frac{2}{4}=\frac{3}{6}=\frac{4}{8}$

a)



b)



Kasrlarni qisqartirish

Barcha o‘quvchilar	$\frac{8}{16} = \frac{4}{8} = \frac{2}{4} = \frac{1}{2}$ (÷ 2 har bir qadamda) ko‘rinishidagi misollarni yechadi.
Aksariyat o‘quvchilar	Istalgan kasrni qisqartira oladi, maxraji berilgan bo‘lsa, suratidagi sonni topa oladi yoki, aksincha, surati berilsa, maxrajidagi sonni topadi.
Ba’zi o‘quvchilar	$\frac{4}{5} = \frac{16}{x+7}$ ko‘rinishidagi tenglamalarni yechadi.

➢ *Faollashtiruvchi savol va topshiriqlar*

1. Yarimga qaysi kasr mos keladi?
2. Chorakka qanday kasr mos keladi?
3. 1 ga teng nechta kasr ayta olasiz?
4. Kasrni qisqartirish deganda nimani tushunasiz?
5. $\frac{6}{9}$ kasrni 3 ga qisqartiring.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrni qisqartirishda faqat suratini yoki faqat maxrajini o‘sha songa bo‘lib qo‘yadilar. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uyga vazifa*

13-, 14-15-misollar (22-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Umumiy bo‘luvchilar nimaga teng?

a) $\frac{4}{12} = \frac{4\div2}{12\div2} = \frac{2\div2}{6\div2} = \frac{1}{3}$

b) $\frac{5}{25} = \frac{5\div5}{25\div5} = \frac{1}{5}$

c) $\frac{12}{36} = \frac{12\div2}{36\div2} = \frac{6\div2}{18\div2} = \frac{3\div3}{9\div3} = \frac{1}{3}$

d) $\frac{14}{63} = \frac{14\div7}{63\div7} = \frac{2}{9}$

e) $\frac{18}{108} = \frac{18\div2}{108\div2} = \frac{9\div3}{54\div3} = \frac{3\div3}{18\div3} = \frac{1}{6}$

f) $\frac{50}{225} = \frac{50\div5}{225\div5} = \frac{10\div5}{45\div5} = \frac{2}{9}$

g) $\frac{48}{576} = \frac{48\div2}{576\div2} = \frac{24\div2}{288\div2} = \frac{12\div2}{144\div2} = \frac{6\div2}{72\div2} = \frac{3\div3}{36\div3} = \frac{1}{12}$

2. Kasrni qisqartirish qanday amalga oshirilgan? Berilgan kasrlarni namuna asosida qisqartiring.

$$\frac{168}{294}=\frac{168\div2}{294\div2}=\frac{84}{147}=\frac{84\div3}{147\div3}=\frac{28}{49}=\frac{28\div7}{49\div7}=\frac{4}{7}$$

a) $\frac{64}{88}=\frac{64\div2}{88\div2}=\frac{32\div2}{44\div2}=\frac{16\div2}{22\div2}=\frac{8}{11}$ b) $\frac{99}{110}=\frac{99\div11}{110\div11}=\frac{9}{10}$

c) $\frac{222}{234}=\frac{222\div2}{234\div2}=\frac{111\div3}{117\div3}=\frac{37}{39}$

3. Bolalarning natijalarini taqqoslang.

Alisher basketbol to‘pini 18 marta otdi va 8 marta to‘rga tushirdi.	Adiba basketbol to‘pini 9 marta otdi va 4 marta to‘rga tushirdi.

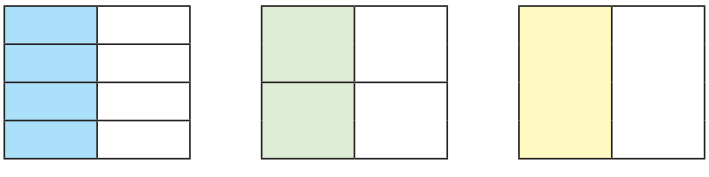
Alisher: $\frac{8}{18}=\frac{8\div2}{18\div2}=\frac{4}{9}$; Adiba: $\frac{4}{9}$; Taqqoslash: $\frac{4}{9}=\frac{4}{9}$.

4. Kasrlarni qisqartiring.

a) $\frac{4}{6}=\frac{4\div2}{6\div2}=\frac{1}{3}$; $\frac{8}{10}=\frac{8\div2}{10\div2}=\frac{4}{5}$; $\frac{14}{26}=\frac{14\div2}{26\div2}=\frac{7}{13}$; $\frac{34}{46}=\frac{34\div2}{46\div2}=\frac{17}{23}$

b) $\frac{3}{9}=\frac{3\div3}{9\div3}=\frac{1}{3}$; $\frac{12}{15}=\frac{12\div3}{15\div3}=\frac{4}{5}$; $\frac{18}{21}=\frac{18\div3}{21\div3}=\frac{6}{7}$; $\frac{39}{48}=\frac{39\div3}{48\div3}=\frac{13}{16}$

5. Bo‘yalgan sohalarga mos teng kasrlar hosil qiling.



$\frac{4}{8}$ = $\frac{2}{4}$ = $\frac{1}{2}$

6. Qisqartiring.

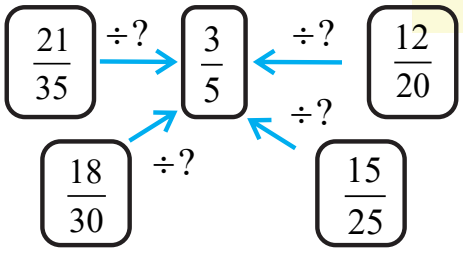
a) $\frac{4}{8}=\frac{4\div4}{8\div4}=\frac{1}{2}$; $\frac{12}{16}=\frac{12\div4}{16\div4}=\frac{3}{4}$; $\frac{20}{24}=\frac{20\div4}{24\div4}=\frac{5}{6}$; $\frac{28}{32}=\frac{28\div4}{32\div4}=\frac{7}{8}$

b) $\frac{18}{30}=\frac{18\div6}{30\div6}=\frac{3}{5}$; $\frac{42}{48}=\frac{42\div6}{48\div6}=\frac{7}{8}$; $\frac{54}{66}=\frac{54\div6}{66\div6}=\frac{9}{11}$; $\frac{90}{126}=\frac{90\div6}{126\div6}=\frac{15}{21}$

7. Umumiy bo‘luvchilarni toping.

$\frac{21}{36}=\frac{21\div7}{35\div7}=\frac{3}{5}$ $\frac{18}{30}=\frac{18\div6}{30\div6}=\frac{3}{5}$

$\frac{12}{20}=\frac{12\div4}{20\div4}=\frac{3}{5}$ $\frac{21}{35}=\frac{21\div7}{35\div7}=\frac{3}{5}$



8. Kasrlardan qaysi biri $\frac{48}{60}$ ga va qaysi biri $\frac{36}{84}$ ga teng?

Javob: $\frac{48}{60}=\frac{24}{30}=\frac{12}{15}=\frac{8}{10}=\frac{4}{5}$ $\frac{36}{84}=\frac{18}{42}=\frac{12}{28}=\frac{9}{21}=\frac{6}{14}=\frac{3}{7}$

1	2	3	4	5	6	7	8	9	10	11	12
$\frac{3}{7}$	$\frac{8}{10}$	$\frac{12}{10}$	$\frac{24}{30}$	$\frac{12}{28}$	$\frac{12}{15}$	$\frac{9}{15}$	$\frac{16}{20}$	$\frac{9}{21}$	$\frac{6}{14}$	$\frac{18}{42}$	$\frac{4}{5}$

9*. Tenglamalarni yeching.

Yo‘llanma: 28 va 42 ning EKUBi 7. Demak, 42 ÷ 7 = 6, 28 ÷ 7 = 4. Surat 4 ga teng bo‘lishi uchun x noma’lum o‘rniga 3 soni mos keladi.

a) $\frac{28}{42}=\frac{3+1}{6}$ b) $\frac{55}{75}=\frac{11}{7+8}$ c) $\frac{63}{84}=\frac{3}{8-4}$ d) $\frac{120}{140}=\frac{9-3}{7}$

10. Yulduzcha o‘rniga mos sonni qo‘ying.

a) $\frac{18}{28}=\frac{9}{14}$ b) $\frac{35}{45}=\frac{7}{9}$ c) $\frac{49}{56}=\frac{7}{8}$

d) $\frac{51}{68}=\frac{3}{4}$ e) $\frac{220}{440}=\frac{1}{2}$ f) $\frac{450}{550}=\frac{9}{11}$

11. Noma’lumlarni toping.

a) $\frac{40}{60}=\frac{40\div2}{60\div2}=\frac{20\div2}{30\div2}=\frac{10\div5}{15\div5}=\frac{2}{3}$ b) $\frac{2}{3}=\frac{2\times2}{3\times2}=\frac{4\times2}{6\times2}=\frac{8\times2}{12\times2}=\frac{16}{24}$

a) $\frac{40}{60}=\frac{?}{?}=\frac{?}{15}=\frac{?}{?}$ (÷2, ÷?, ÷?, ÷?, ÷?, ÷?)

b) $\frac{2}{3}=\frac{?}{?}=\frac{?}{?}=\frac{?}{?}=\frac{?}{?}$ (×2, ×?, ×?, ×?, ×?, ×?)

12. $\frac{20-n}{24}$ qisqaradigan $n = 2, 4, 5, 6, 8, 10, 11, 12, 14, 16, 17, 18$

qisqarmaydigan $n = 1, 3, 7, 9, 13, 15, 19$

13. Kasrlarni qisqartiring.

a) $\frac{15}{20}=\frac{15\div5}{20\div5}=\frac{3}{4}$

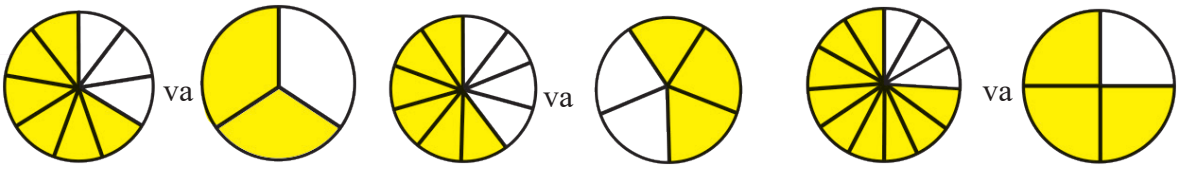
b) $\frac{22}{24}=\frac{22\div2}{24\div2}=\frac{11}{12}$

c) $\frac{18}{90}=\frac{18\div2}{90\div2}=\frac{9\div3}{45\div3}=\frac{3\div3}{15\div3}=\frac{1}{5}$

d) $\frac{30}{54}=\frac{30\div2}{54\div2}=\frac{15\div3}{27\div3}=\frac{5}{9}$

14. Bo‘yalgan sohalarni kasrlarda ifodalang. Xulosangizni ayting.

a) $\frac{6}{9}=\frac{2}{3}$ b) $\frac{6}{10}=\frac{3}{5}$ c) $\frac{9}{12}=\frac{3}{4}$



15. a) $\frac{6}{8};\frac{12}{22};\frac{30}{38};\frac{42}{58}$ kasrlarni 2 ga; b) $\frac{6}{9};\frac{15}{27};\frac{21}{39};\frac{51}{60}$ kasrlarni 3 ga qisqartiring.

a) $\frac{6}{8}=\frac{6\div2}{8\div2}=\frac{3}{4}$; $\frac{12}{22}=\frac{12\div2}{22\div2}=\frac{6}{11}$; $\frac{30}{38}=\frac{30\div2}{38\div2}=\frac{15}{19}$; $\frac{42}{58}=\frac{42\div2}{58\div2}=\frac{21}{29}$

b) $\frac{6}{9}=\frac{6\div3}{9\div3}=\frac{2}{3}$; $\frac{15}{27}=\frac{15\div3}{27\div3}=\frac{5}{9}$; $\frac{21}{39}=\frac{21\div3}{39\div3}=\frac{7}{13}$; $\frac{51}{60}=\frac{51\div3}{60\div3}=\frac{17}{20}$

Kasrlarni umumiy maxrajga keltirish

Barcha o‘quvchilar	$\frac{2}{3}$ va $\frac{5}{6}$ ko‘rinishdagi kasrlarni umumiy maxrajga keltiradi.
Aksariyat o‘quvchilar	$\frac{4}{9}$ va $\frac{5}{23}$ ko‘rinishdagi kasrlarni umumiy maxrajga keltiradi.
Ba’zi o‘quvchilar	Aralash sonlarni umumiy maxrajga keltiradi.

➢ *Faollashtiruvchi savol va topshiriqlar:*

1. Kasrni qisqartirish deganda nimani tushunasiz.

2. $\frac{2}{16}$ kasrni qisqartiring.

3. Umumiy maxrajga keltirishda surat bir xil bo‘lishi kerakmi, maxrajmi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrni umumiy maxrajga keltirishda faqat surati yoki faqat maxrajini o‘sha songa ko‘paytirib qo‘yadilar. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uyga vazifa*

6-, 7-8-misollar (24-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Kasrlarni umumiy maxrajga keltiring.

a) $\left(\frac{4}{25};\frac{3}{10}\right)$ $EKUK(25;10)=50$, $\frac{4}{25}=\frac{4\times2}{25\times2}=\frac{8}{50}$; $\frac{3}{10}=\frac{3\times5}{10\times5}=\frac{15}{50}$

b) $\left(\frac{1}{6};\frac{1}{9}\right)=\left(\frac{3}{18};\frac{2}{18}\right)$ c) $\left(\frac{3}{10};\frac{4}{25}\right)=\left(\frac{15}{50};\frac{8}{50}\right)$ d) $\left(\frac{3}{10};\frac{3}{4}\right)=\left(\frac{6}{20};\frac{15}{20}\right)$

2. Bo‘sh kataklarni to‘ldiring. $\left(\frac{2}{5};\frac{5}{6}\right)=\left(\frac{12}{30};\frac{25}{30}\right)$ $\left(\frac{1}{4};\frac{5}{7}\right)=\left(\frac{7}{28};\frac{20}{28}\right)$

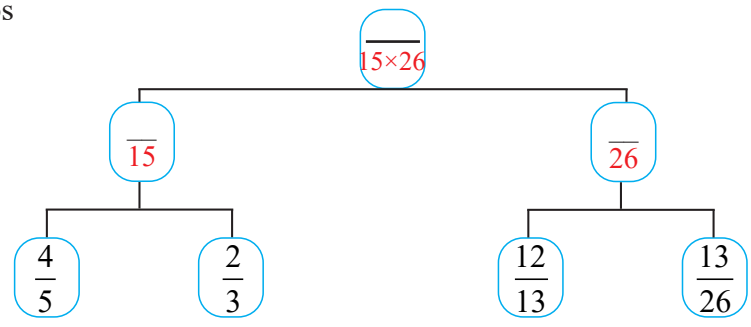
3. $\left(\frac{5}{8};\ \frac{7}{12}\right)$ kasrlarni umumiy maxrajga keltiring.

$\frac{5}{8}=\frac{5\times3}{8\times3}=\frac{15}{24}$ $\frac{7}{12}=\frac{7\times2}{12\times2}=\frac{14}{24}$ $\left(\frac{15}{24};\frac{14}{24}\right)$

4. So‘roq belgisi o‘rniga mos keladigan sonni toping.

$\left(\frac{4}{5};\frac{2}{3}\right)=\left(\frac{12}{15};\frac{10}{15}\right)$

$\left(\frac{12}{13};\frac{13}{26}\right)=\left(\frac{24}{26};\frac{13}{26}\right)$



Eslatma: *surat o‘rnidagi sonni topish muhim emas! Maqsad: umumiy maxraj topish.*

5. Kasrlarni umumiy maxrajga keltiring.

a) $\left(\frac{4}{7};\frac{7}{8}\right)=\left(\frac{32}{56};\frac{49}{56}\right)$ b) $\left(\frac{3}{11};\frac{8}{13}\right)=\left(\frac{39}{143};\frac{88}{143}\right)$

c) $\left(\frac{4}{17};\frac{1}{33}\right)=\left(\frac{132}{561};\frac{17}{561}\right)$ d) $\left(\frac{2}{21};\frac{3}{25}\right)=\left(\frac{50}{525};\frac{63}{525}\right)$

6. Kasrlarni qisqartiring, so‘ngra umumiy maxrajga keltiring.

a) $\left(\frac{3}{9};\frac{5}{25}\right)=\left(\frac{3\div3}{9\div3};\frac{5\div5}{25\div5}\right)=\left(\frac{1}{3};\frac{1}{5}\right)=EKUK(3;5)=15,\left(\frac{5}{15};\frac{3}{15}\right)$

b) $\left(\frac{4}{8};\frac{3}{6}\right)=\left(\frac{1}{2};\frac{1}{2}\right)$ c) $\left(\frac{9}{72};\frac{8}{72}\right)$ d) $\left(\frac{21}{98};\frac{20}{84}\right)=\left(\frac{9}{42};\frac{10}{42}\right)$

7. Sonlarni umumiy maxrajga keltiring. **Namuna:** $\left(\frac{1}{2};\frac{2}{5}\right)=\left(\frac{1\times5}{2\times5};\frac{2\times2}{5\times2}\right)=\left(\frac{5}{10};\frac{4}{10}\right)$

a) $\left(\frac{3}{4};\frac{5}{6}\right)=\left(\frac{3\times3}{4\times3};\frac{5\times2}{6\times2}\right)=\left(\frac{9}{12};\frac{10}{12}\right)$ b) $\left(\frac{2}{5};\frac{7}{10}\right)=\left(\frac{4}{10};\frac{7}{10}\right)$

c) $\left(\frac{2}{9};\frac{5}{6}\right)=\left(\frac{4}{18};\frac{15}{18}\right)$ d) $\left(\frac{7}{8};\frac{1}{6}\right)=\left(\frac{21}{24};\frac{4}{24}\right)$

8. Aralash sonlarni bir xil maxrajga keltiring.

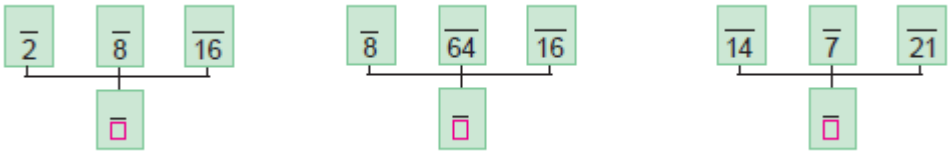
a) $\left(1\frac{3}{5};1\frac{13}{25}\right)=\left(1\frac{3\times5}{5\times5};1\frac{13\times1}{25\times1}\right)=\left(1\frac{15}{25};1\frac{13}{25}\right)$ b) $\left(2\frac{7}{10};3\frac{3}{4}\right)=\left(2\frac{14}{20};3\frac{15}{20}\right)$

c) $\left(3\frac{9}{20};1\frac{3}{8}\right)=\left(3\frac{18}{40};1\frac{15}{40}\right)$ d) $\left(3\frac{3}{8};4\frac{9}{10}\right)=\left(3\frac{15}{40};4\frac{36}{40}\right)$

9. Kasrlar maxrajini 48 ga keltiring. **Javob:** $\frac{16}{48};\frac{12}{48};\frac{8}{48};\frac{6}{48};\frac{4}{48};\frac{3}{48};\frac{2}{48}$

10. Umumiy maxraj toping.

EKUK (2;8;16) = 16 EKUK (8;64;16) = 64 EKUK (4;7;21) = 21



11. Berilgan barcha sonlar uchun umumiy maxraj toping.

$$\left(1\frac{1}{4};\frac{9}{10};\frac{4}{5};1\frac{3}{10}\right)=\left(1\frac{10}{40};\frac{36}{40};\frac{32}{40};1\frac{12}{40}\right)$$

12. Kasrlarni umumiy maxrajga keltiring.

a) $\left(\frac{4}{9};\frac{9}{27}\right)=\left(\frac{12}{27};\frac{9}{27}\right)$ b) $\left(\frac{7}{8};\frac{5}{6}\right)=\left(\frac{21}{24};\frac{20}{24}\right)$ c) $\left(\frac{1}{13};\frac{9}{39}\right)=\left(\frac{3}{39};\frac{9}{39}\right)$

d) $\left(\frac{35}{50};\frac{64}{80}\right)=\left(\frac{7}{10};\frac{8}{10}\right)$ e) $\left(\frac{14}{20};\frac{35}{50}\right)=\left(\frac{7}{10};\frac{7}{10}\right)$

13. Kasrlarni qisqartiring, so‘ngra umumiy maxrajga keltiring.

a) $\left(\frac{12}{108};\frac{70}{180}\right)=\left(\frac{2}{18};\frac{7}{18}\right)$ b) $\left(\frac{14}{35};\frac{20}{45}\right)=\left(\frac{2}{5};\frac{4}{9}\right)=\left(\frac{18}{45};\frac{20}{45}\right)$

c) $\left(\frac{8}{64};\frac{8}{40}\right)=\left(\frac{5}{40};\frac{8}{40}\right)$ d) $\left(\frac{14}{21};\frac{30}{90}\right)=\left(\frac{2}{3};\frac{1}{3}\right)$

Har xil maxrajli kasrlarni taqqoslash

Barcha o‘quvchilar	$\frac{2}{3}$ va $\frac{5}{6}$ ko‘rinishidagi kasrlarni taqqoslaydi.
Aksariyat o‘quvchilar	$\frac{4}{9}$ va $\frac{5}{23}$ ko‘rinishidagi kasrlarni taqqoslaydi.
Ba’zi o‘quvchilar	Barcha kasrlar va aralash sonlarni taqqoslaydi.

➢ *Faollashtiruvchi savollar*

1. Umumiy maxrajga keltirishda surat bir xil bo‘lishi kerakmi yoki maxraj?
2. Kasrlarni taqqoslaganda surati kattasi katta bo‘ladimi, maxraji kattasimi?
3. $\frac{3}{4}$ va $\frac{1}{4}$ ning qaysi biri katta?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrni taqqoslashda faqat suratini yoki faqat maxrajini o‘sha songa ko‘paytirib qo‘yadilar. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak (taqdimotlar, tarqatmalar, ko‘rgazmali qurollar tayyorlang).

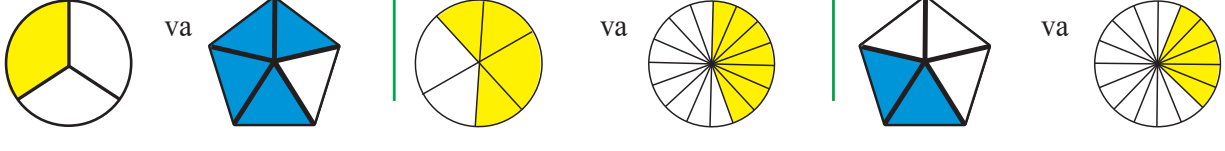
➢ *Uyga vazifa*

8-9-misollar (26-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Modellarga mos kasrlarni taqqoslang.

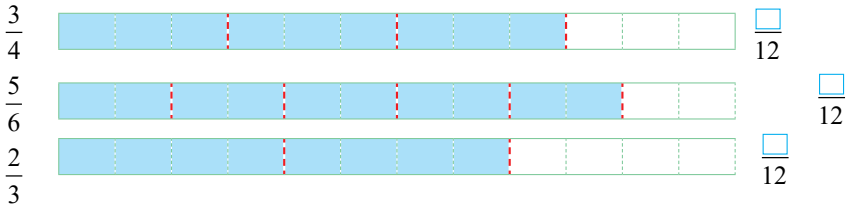
$\frac{1}{3} < \frac{4}{5} \to \frac{1\times5}{3\times5}; \frac{4\times3}{5\times3} \to \frac{5}{15}; \frac{12}{15}$ $\qquad \frac{4}{6} > \frac{7}{16}$ $\qquad \frac{2}{5} > \frac{5}{16}$



2. Kasrlarni taqqoslang.

$\left(\frac{3}{4};\frac{5}{6}\right) \Rightarrow \left(\frac{9}{12};\frac{10}{12}\right) \Rightarrow \frac{3}{4} < \frac{5}{6}$ $\qquad \left(\frac{5}{6};\frac{2}{3}\right) \Rightarrow \left(\frac{10}{12};\frac{8}{12}\right) \Rightarrow \frac{5}{6} > \frac{2}{3}$

$\left(\frac{3}{4};\frac{2}{3}\right)\Rightarrow\left(\frac{9}{12};\frac{8}{12}\right)\Rightarrow\frac{3}{4}>\frac{2}{3}$



3. Kasrlar o‘sib borish tartibida joylashganmi? $\frac{9}{15}$ $\frac{4}{5}$ $\frac{16}{20}$ $\frac{24}{30}$ $\frac{12}{10}$ $\frac{8}{10}$

Yo‘llanma: *kasrning asosiy xossasidan foydalananing.*

4. Kasrlar kamayib borish tartibida joylashganmi? $\frac{3}{7}$ $\frac{12}{28}$ $\frac{9}{21}$ $\frac{6}{14}$ $\frac{18}{42}$

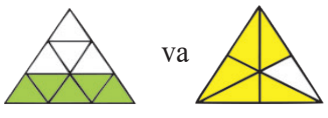
Yo‘llanma: *kasrning asosiy xossasidan foydalansak, berilgan kasrlar barchasi teng ekani ko‘rinadi.*

5. Modellarga mos kasrlarni taqqoslang.

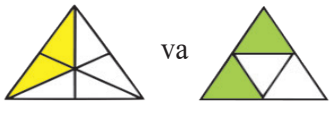
$\frac{3}{4}<\frac{8}{9}$ va



$\frac{5}{9}<\frac{5}{6}$ va



$\frac{2}{6}<\frac{2}{4}$ va



6. Tengsizlikni qanoatlantiruvchi barcha x larni toping: $\frac{7}{17}>\frac{x}{17}$. **Javob:** $x = 1,2,3,4,5,6$.

7. Umida maktabga borish uchun $\frac{5}{12}$, Ma’mura $\frac{1}{3}$ soat sarflaydi. Qaysi biri maktabga tezroq yetib boradi?

Javob: $\frac{5}{12}>\frac{4}{12}$ Umida maktabga borish uchun ko‘p vaqt sariflaydi. Ma’mura maktabga tezroq yetib boradi.

8. Kasrlarni taqqoslang.

a) $\frac{61}{23}>\frac{9}{23}$ b) $\frac{29}{58}<\frac{31}{58}$ c) $\frac{17}{100}<\frac{21}{100}$ d) $\frac{17}{40}>\frac{17}{45}$

e) $\frac{9}{4}<\frac{9}{2}$ f) $\frac{3}{98}<\frac{3}{94}$ g) $1>\frac{11}{14}$ h) $1<\frac{28}{25}$

9. Kasrlarni taqqoslang.

a) $\frac{7}{9}>\frac{11}{27}$ b) $\frac{3}{40}<\frac{11}{20}$ c) $\frac{3}{5}<\frac{5}{7}$ d) $\frac{2}{3}>\frac{4}{15}$

e) $\frac{2}{7}>\frac{4}{15}$ f) $\frac{11}{12}>\frac{13}{16}$ g) $\frac{11}{12}<\frac{13}{14}$ h) $\frac{22}{23}=\frac{44}{46}$

Har xil maxrajli kasrlarni qo‘shish

Barcha o‘quvchilar	$\frac{1}{6}+\frac{5}{6}$ va $\frac{2}{9}+\frac{1}{3}$ ko‘rinishidagi kasrlarni qo‘shadi.
Aksariyat o‘quvchilar	$\frac{4}{9}+\frac{5}{23}$ ko‘rinishidagi kasrlarni qo‘shadi.
Ba’zi o‘quvchilar	Barcha kasrlar va har xil maxrajli kasrlarga doir tenglamalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. $\frac{3}{4}$ va $\frac{1}{4}$ kasrlarni qo‘shganda maxraji necha bo‘ladi?
2. $\frac{3}{4}$ va $\frac{5}{6}$ kasrlarning umumiy maxraji necha bo‘ladi?
3. Kasrlarni qo‘shishda suratini bir xil qilib olamizmi, maxrajinimi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrni qo‘shganda faqat surati yoki faqat maxrajini o‘sha songa qo‘shib qo‘yadilar, ba’zan maxrajini bir xil qilib olishsa ham, maxrajlarni qo‘shib qo‘yadilar. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak (taqdimotlar, tarqatmalar, ko‘rgazmali qurollar tayyorlang).

➢ *Uyga vazifa*

17-, 18-19-misollar (30-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Kasrlarni qo‘shing.

a) $\frac{2}{25}+\frac{3}{5}=\frac{2}{25}+\frac{3\times5}{5\times5}=\frac{2}{25}+\frac{15}{25}=\frac{2+15}{25}=\frac{17}{25}$

b) $\frac{4}{9}+\frac{1}{3}=\frac{7}{9}$

c) $\frac{5}{7}+\frac{3}{14}=\frac{13}{14}$

d) $\frac{7}{12}+\frac{5}{18}=\frac{31}{36}$

2. Hisoblang.

a) $\frac{1}{2}+\frac{3}{4}+\frac{5}{8}=\frac{1\times4}{2\times4}+\frac{3\times2}{4\times2}+\frac{5}{8}=\frac{4+6+5}{8}=\frac{15}{8}=1\frac{7}{8}$

b) $\frac{3}{5}+\frac{7}{10}+\frac{2}{15}=1\frac{13}{30}$

c) $\frac{4}{9}+\frac{2}{3}+\frac{1}{6}=1\frac{5}{18}$

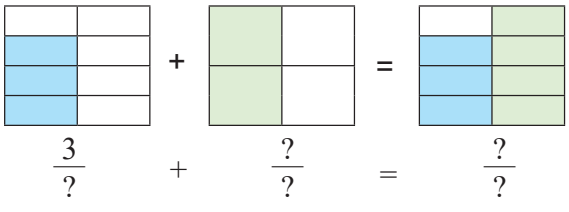
d) $\frac{5}{7}+\frac{1}{2}+\frac{3}{14}=1\frac{3}{7}$

3. Toshkent va Farg‘onadan bir vaqtda bir-biriga qarab ikkita avtomobil yo‘lga chiqdi. Ulardan biri ma’lum vaqtda yo‘lning $\frac{1}{5}$ qismini, ikkinchisi esa $\frac{7}{40}$ qismini bosib o‘tdi. Ular birgalikda jami yo‘lning qanday qismini bosib o‘tgan?

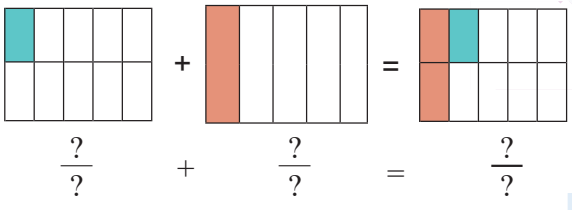
Yechish: $\frac{1}{5}+\frac{7}{40}=\frac{3}{8}$

4. Bo‘yalgan sohalar asosida kasrlarni qo‘shing.

$\frac{3}{8}+\frac{2}{4}=\frac{7}{8}$



$\frac{1}{10}+\frac{1}{5}=\frac{3}{10}$



5. Hisoblang.

a) $\frac{3}{5}+\frac{2}{7}=\frac{3\times7+5\times2}{5\times7}=\frac{31}{35}$ b) $\frac{3}{4}+\frac{1}{7}=\frac{25}{28}$ c) $\frac{4}{9}+\frac{2}{5}=\frac{38}{45}$ d) $\frac{5}{11}+\frac{2}{9}=\frac{67}{99}$

6. Hisoblang.

a) $\frac{1}{3}+\frac{1}{4}+\frac{1}{5}=\frac{1\times4\times5+1\times3\times5+1\times3\times4}{3\times4\times5}=\frac{20+15+12}{60}=\frac{47}{60}$ b) $\frac{1}{5}+\frac{1}{6}+\frac{1}{7}=\frac{107}{210}$

c) $\frac{2}{3}+\frac{3}{5}+\frac{1}{2}=1\frac{23}{30}$ d) $\frac{5}{6}+\frac{4}{7}+\frac{4}{5}=2\frac{43}{210}$

7. Jadvalni to‘ldiring.

+	$\frac{1}{2}$	$\frac{3}{5}$	$\frac{1}{6}$	$\frac{3}{10}$	$\frac{5}{8}$
$\frac{2}{3}$	$\frac{7}{6}=1\frac{1}{6}$	$\frac{19}{15}=1\frac{4}{15}$	$\frac{5}{6}$		
$\frac{1}{5}$					

Ko‘rsatma: yig‘indining surat va maxraji qisqarsa qisqartiring.

9. Uchburchakning tomonlari $\frac{2}{7}$ m, $\frac{5}{21}$ m va $\frac{3}{14}$ m ga teng. Shu uchburchakning perimetrini toping.

Yechish: $\frac{2}{7}+\frac{5}{21}+\frac{3}{14}=\frac{31}{42}$.

10. O‘ngdagi rasmdan foydalanib hisoblang.

$$\frac{\text{ko‘k rang}}{\text{qizil rang}}+\frac{\text{sariq rang}}{\text{jami rang}}$$



Yechish: $\frac{3}{4}+\frac{5}{12}=\frac{9}{12}+\frac{5}{12}=\frac{14}{12}=1\frac{2}{12}=1\frac{1}{6}$

11*. Tenglamani yeching (*ayirish amalidan foydalanmang*).

Yechish: a) 2-qo‘shiluvchi $\frac{2}{5}$ kasrni maxraji 15 bo‘lgan teng kasr ko‘rinishida yozib olamiz. Keyingi jarayon og‘zaki bajariladi.

12*. A, B, C larni toping va ularni taqqoslang.

Javob: a) $A=7$ b) $B=2$ c) $C=1$

13. Bo‘sh kataklarni to‘ldiring.

a) $\frac{2}{5}+\frac{7}{15}=\frac{2\times3}{5\times3}+\frac{7}{15}=\frac{6}{15}+\frac{7}{15}=\frac{13}{15}$; b) $\frac{2}{9}+\frac{11}{12}=\frac{2\times4}{9\times4}+\frac{11\times3}{12\times3}=\frac{8}{36}+\frac{33}{36}=\frac{41}{36}=1\frac{5}{36}$

14. Azamat $\frac{1}{5}$ kg olma, $\frac{1}{8}$ kg nok, $\frac{1}{10}$ kg shakar va $\frac{9}{10}$ kg suvni aralashtirib, o‘ziga ichimlik tayyorladi. Azamat tayyorlagan ichimlikning massasini toping.

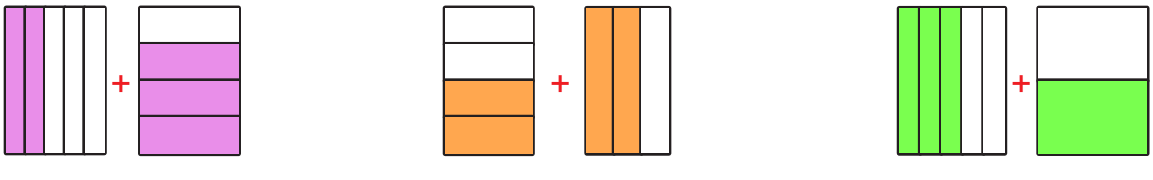
Yechish: $\frac{1}{5}+\frac{1}{8}+\frac{1}{10}+\frac{9}{10}=\frac{8+5+1+9}{40}=\frac{23}{40}$ kg ichimlik tayyorlangan.

15. Yulduzcha o‘rnidagi sonni toping.

Javob: a) $*=4$ b) $*=2$ c) $*=9$

16. Modellar asosida qo‘shing.

a) $\frac{2}{5}+\frac{3}{4}=1\frac{3}{20}$ b) $\frac{2}{4}+\frac{2}{3}=1\frac{1}{6}$ c) $\frac{3}{5}+\frac{1}{2}=1\frac{1}{10}$



Har xil maxrajli kasrlarni ayirish

Barcha o‘quvchilar	$\frac{5}{6}-\frac{1}{6}$ va $\frac{7}{9}-\frac{1}{3}$ ko‘rinishidagi kasrlarni ayiradi.
Aksariyat o‘quvchilar	$\frac{3}{9}-\frac{1}{23}$ ko‘rinishidagi kasrlarni ayiradi.
Ba’zi o‘quvchilar	Barcha kasrlarni ayira oladi va har xil maxrajli kasrlarga doir tenglamalarni ham yechadi.

➢ *Faollashtiruvchi savollar*

1. $\frac{3}{4}$ va $\frac{1}{4}$ kasrlarni ayirganda maxraji necha bo‘ladi?
2. $\frac{3}{4}$ va $\frac{5}{6}$ kasrlarni ayirganda maxraji necha bo‘ladi?
3. Kasrlarni qo‘shishda suratini bir xil qilib olamizmi, maxrajinimi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrni qo‘shganda va ayirganda faqat suratini yoki faqat maxrajini o‘sha songa qo‘shib yoki ayirib qo‘yadilar, ba’zan maxrajini bir xil qilib olishsa ham, maxrajlarini qo‘shib yoki ayirib qo‘yadilar. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak (taqdimotlar, tarqatmalar, ko‘rgazmali qurollar tayyorlang).

➢ *Uyga vazifa*

18-, 19-20-misollar (32-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Hisoblang.

a) $\frac{1}{2}-\frac{1}{6}\Rightarrow\frac{1\times3}{2\times3}-\frac{1}{6}\Rightarrow\frac{3}{6}-\frac{1}{6}=\frac{3-1}{6}=\frac{2}{6}=\frac{1}{3}$

b) $\frac{11}{15}-\frac{3}{5}=\frac{2}{15}$

c) $\frac{4}{5}-\frac{13}{20}=\frac{3}{20}$

d) $\frac{5}{6}-\frac{13}{18}=\frac{1}{9}$

2. Hisoblang.

a) $\frac{7}{9}-\frac{1}{3}-\frac{5}{18}\Rightarrow\frac{7\times2}{9\times2}-\frac{1\times6}{3\times6}-\frac{5}{18}\Rightarrow\frac{14}{18}-\frac{6}{18}-\frac{5}{18}=\frac{14-6-5}{18}=\frac{3}{18}=\frac{1}{6}$

b) $\frac{7}{8}-\frac{1}{4}-\frac{1}{6}=\frac{11}{24}$

c) $\frac{3}{5}-\frac{3}{10}-\frac{2}{15}=\frac{1}{6}$

d) $\frac{5}{6}-\frac{2}{9}-\frac{5}{12}=\frac{7}{36}$

3. Hisoblang.

a) $\frac{13}{14}-\frac{3}{4}=\frac{5}{28}$ b) $\frac{11}{12}-\frac{7}{8}=\frac{1}{24}$

c) $\frac{14}{15}-\frac{7}{10}=\frac{7}{30}$ d) $\frac{7}{16}-\frac{5}{12}=\frac{1}{48}$

4. Bayram arafasida bozorga keltirilgan $\frac{14}{25}$ tonna apelsinning $\frac{5}{40}$ tonnasi sotildi. Qancha apelsin sotilmay qolgan?

Yechish: $\frac{14}{25}-\frac{5}{40}=\frac{\overset{8}{\cancel{14}}}{25}-\frac{\overset{25}{\cancel{1}}}{8}=\frac{112-25}{200}=\frac{87}{200}$ tonna sotilmagan.

5. Tenglamani yeching.

a) $x-\frac{5}{6}=\frac{1}{12}\Rightarrow x=\frac{1}{12}+\frac{5}{6}\Rightarrow x=\frac{11}{12}$ b) $x=\frac{1}{2}$ c) $x=\frac{13}{16}$ d) $x=\frac{9}{20}$

6. Hisoblang.

a) $\frac{4}{5}-\frac{1}{2}-\frac{1}{6}=\frac{2}{15}$ b) $\frac{5}{6}-\frac{2}{5}-\frac{1}{7}=\frac{61}{210}$ c) $\frac{1}{2}-\frac{2}{7}-\frac{1}{5}=\frac{1}{70}$ d) $\frac{11}{14}-\frac{1}{7}-\frac{1}{6}=\frac{10}{21}$

7. Amallarni bajaring.

a) $\frac{3}{4}-\frac{1}{2}+\frac{1}{6}=\frac{9-6+2}{12}=\frac{5}{12}$ b) $\frac{5}{9}+\frac{7}{12}-\frac{2}{3}=\frac{17}{36}$

c) $\frac{5}{8}-\frac{3}{10}+\frac{13}{20}=\frac{39}{40}$ d) $\frac{13}{15}+\frac{1}{2}-\frac{2}{3}=\frac{7}{10}$

8. Velosipedchi tushgacha yo‘lning $\frac{3}{8}$ qismini, tushdan keyin $\frac{1}{3}$ qismini bosib o‘tdi. U kun davomida yo‘lning qancha qismini bosib o‘tgan?

Yechish: $\frac{3}{8}+\frac{1}{3}=\frac{17}{24}$ qismini bosib o‘tgan.

9. Agar $p=\frac{3}{5};\frac{7}{9};\frac{8}{15};\frac{13}{20}$ bo‘lsa, $\frac{5}{6}-p$ ifodaning qiymatini toping.

$\frac{5}{6}-\frac{3}{5}=\frac{7}{30}$; $\frac{5}{6}-\frac{7}{9}=\frac{1}{18}$; $\frac{5}{6}-\frac{8}{15}=\frac{3}{10}$; $\frac{5}{6}-\frac{13}{20}=\frac{11}{60}$

10. Kataklar o‘rnidagi sonni toping.

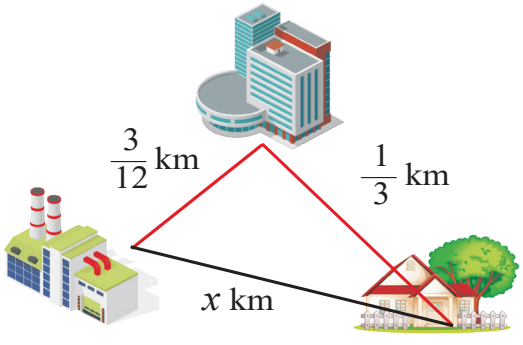
a) $\frac{\square}{20}-\frac{2}{5}=\frac{11}{20}$ b) $\frac{5}{6}-\frac{\square}{18}=\frac{7}{18}$; c) $\frac{2}{3}-\frac{\square}{24}=\frac{3}{8}$ d) $\frac{\square}{45}-\frac{2}{15}=\frac{7}{9}$

Javoblar: a) 19 b) 8 c) 7 d) 41

11–15-topshiriqlarni yechishda 1–10-topshiriqlar yechilishidan foydalaning.

16. Jami binolar orasidagi masofa 3 km bo‘lsa, noma’lum tomon uzunligi necha km?

$$x+\frac{3}{12}+\frac{1}{3}=3 \;\rightarrow\; x=3-\frac{3}{12}-\frac{4}{12}=2\frac{5}{12}$$



17. Amallarni bajaring.

$\frac{19}{24}$	$\frac{3}{9}$	$\frac{243}{216}$
$\frac{5}{12}$	$\frac{3}{10}$	$\frac{55}{60}$
$\frac{9}{24}$	$\frac{3}{90}$	

$\frac{12}{25}$	$\frac{11}{25}$	
$\frac{13}{50}$	$\frac{11}{25}$	
$\frac{14}{75}$	0	

18. Ayirishni bajaring.

a) $\frac{2}{3}-\frac{1}{6}=\frac{1}{2}$ b) $\frac{7}{8}-\frac{5}{16}=\frac{9}{16}$ c) $\frac{8}{9}-\frac{5}{6}=\frac{1}{18}$ d) $\frac{3}{4}-\frac{7}{10}=\frac{1}{20}$

19. Hisoblang.

a) $\frac{4}{5}-\frac{3}{7}=\frac{13}{35}$ b) $\frac{7}{9}-\frac{3}{5}=\frac{8}{45}$ c) $\frac{3}{4}-\frac{2}{9}=\frac{19}{36}$ d) $\frac{5}{8}-\frac{4}{11}=\frac{23}{88}$

20. Hisoblang.

a) $\frac{13}{14}-\frac{2}{7}-\frac{3}{28}=\frac{15}{28}$ b) $\frac{11}{16}-\frac{1}{4}-\frac{3}{8}=\frac{1}{16}$ c) $\frac{4}{5}-\frac{7}{20}-\frac{1}{4}=\frac{1}{5}$

Aralash sonlarni qo‘shish va ayirish

Barcha o‘quvchilar	$5\frac{1}{6}+1\frac{5}{6}$ va $2\frac{2}{9}-1\frac{1}{3}$ ko‘rinishidagi misollarni yechadi.
Aksariyat o‘quvchilar	$3\frac{4}{9};11\frac{5}{23}$ ko‘rinishidagi aralash sonlarni qo‘shib, ayira oladi.
Ba’zi o‘quvchilar	Aralash sonlarni qo‘shib, ayira oladi va aralash sonlarga doir tenglamalarni ham yechadi.

➢ *Faollashtiruvchi savollar*

1. $1\frac{3}{4}$ va $2\frac{1}{4}$ aralash sonlarni ayirganda maxraji necha bo‘ladi?
2. $6\frac{3}{4}$ va $3\frac{5}{6}$ aralash sonlarni qo‘shganda maxraji necha bo‘ladi?
3. Kasrlarni qo‘shishda suratini bir xil qilib olamizmi, maxrajinimi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda aralash sonlarni qo‘shganda va ayirganda faqat suratini yoki faqat maxrajini o‘sha songa qo‘shib yoki ayirib qo‘yadilar, ba’zan maxrajini bir xil qilib olishsa ham, maxrajlarini qo‘shib yoki ayirib qo‘yadilar, yoki butun sonlarni nima qilishni yodidan chiqaradilar. Eng muhimi, aralash sonlarni ayirganda kasr surati kichik bo‘lganda butun olib berishga qiynaladilar, noto‘g‘ri kasrga kelgan yig‘indini aralash songa keltirishga qiynaladilar. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak (taqdimotlar, tarqatmalar, ko‘rgazmali qurollar tayyorlang).

➢ *Uyga vazifa*

21-, 22-23-misollar (36-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Hisoblang.

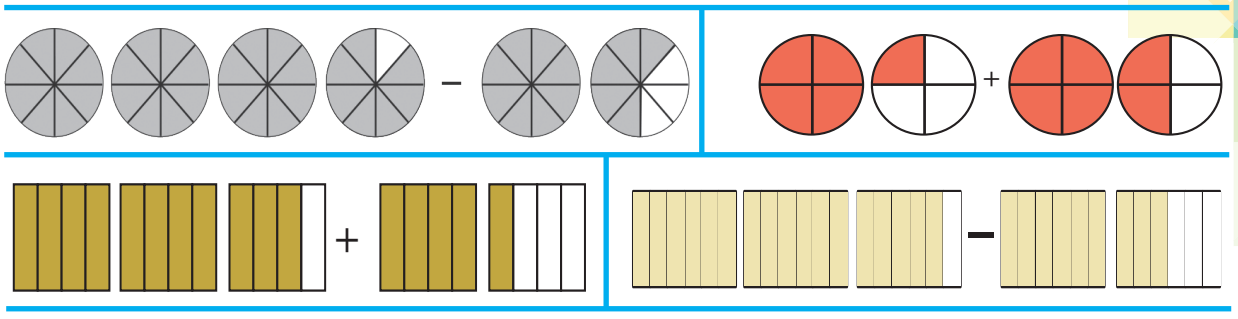
a) $2\frac{1}{4}+3\frac{1}{4}=(2+3)+\left(\frac{1}{4}+\frac{1}{4}\right)=5\frac{2}{4}=5\frac{1}{2}$ b) $6\frac{1}{5}+3\frac{2}{5}=9\frac{3}{5}$ c) $3\frac{1}{2}+2\frac{1}{2}=6$

2. Hisoblang.

a) $8\frac{1}{4}+3\frac{5}{12}=11\frac{2}{3}$ b) $7\frac{2}{5}+5\frac{2}{15}=12\frac{8}{15}$ c) $3\frac{1}{5}+5\frac{1}{3}=8\frac{8}{15}$ d) $6\frac{1}{7}+3\frac{1}{2}=9\frac{9}{14}$

3. Modellar asosida ifodalar tuzib, hisoblang.

$3\frac{7}{8}-1\frac{5}{8}=2\frac{1}{4}$ $1\frac{1}{4}+1\frac{1}{2}=2\frac{3}{4}$



$2\frac{3}{4}+1\frac{1}{4}=4$ $\qquad$ $2\frac{5}{6}-1\frac{3}{6}=1\frac{1}{3}$

4. Sardor bozordan $4\frac{1}{2}$ kg olma va $1\frac{1}{3}$ kg shaftoli olib keldi. U jami necha kg meva olib kelgan?

Yechish: $4\frac{1}{2}+1\frac{1}{3}=5\frac{5}{6}$ kg.

5. Novvoyxonada tongda $7\frac{3}{8}$ qop un non yopish uchun ajratildi. Tushgacha $5\frac{1}{8}$ qop ishlatildi. Tushdan keyin non yopish uchun qancha qop un qoldi?

Yechish: $7\frac{3}{8}-5\frac{1}{8}=2\frac{1}{4}$.

6. Hisoblang.

a) $5\frac{4}{5}+2\frac{1}{3}=8\frac{2}{15}$ $\qquad$ b) $7\frac{5}{7}+5\frac{1}{2}=13\frac{3}{14}$ $\qquad$ c) $11\frac{3}{4}+3\frac{2}{7}=15\frac{1}{28}$

d) $4\frac{3}{5}+5\frac{2}{3}=10\frac{4}{15}$ $\qquad$ e) $7\frac{8}{15}-5\frac{2}{5}=2\frac{2}{15}$ $\qquad$ f) $12\frac{2}{5}-9\frac{3}{10}=3\frac{1}{10}$

7. Zafarda $5\frac{2}{3}$ litr ko‘k va $2\frac{1}{4}$ litr qizil bo‘yoq bor. Jami bo‘yoqlar necha litr?

Yechish: $5\frac{2}{3}+2\frac{1}{4}=7\frac{11}{12}$ L.

8. Zebo gullarga $6\frac{1}{4}$ litr suv quydi. $2\frac{5}{8}$ litr suv bilan mevalarni yuvdi. Zebo jami qancha suv ishlatdi?

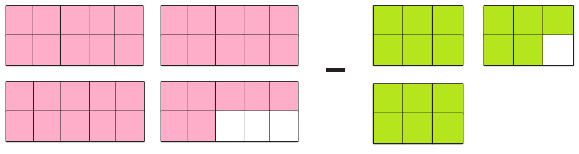
Yechish: $6\frac{1}{4}+2\frac{5}{8}=8\frac{7}{8}$ L.

9. Birinchi velosipedchi $12\frac{4}{15}$ km, ikkinchi velosipedchi $10\frac{5}{7}$ km yo‘l yurishdi. Birinchi velosipedchi ikkinchi velosipedchidan qancha ko‘p yo‘l yurgan?

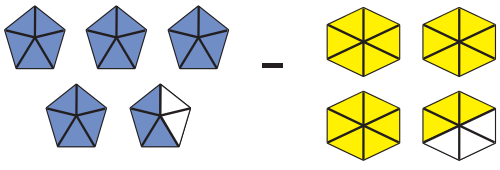
Yechish: $12\frac{4}{15}-10\frac{5}{7}=1\frac{58}{105}$ km.

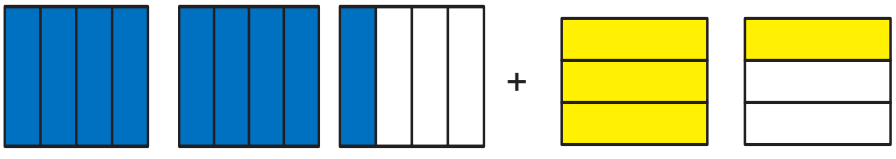
10. Modellar asosida ifodalar tuzib, hisoblang.

$3\frac{7}{10}-2\frac{5}{6}=\frac{26}{30}=\frac{13}{15}$



$4\frac{3}{5}-3\frac{3}{6}=1\frac{3}{30}=1\frac{1}{10}$





Ko‘rsatma: *3-model ham shu tartibda yechiladi.*

11. Aralash sonlarni qo‘shing.

a) $12\frac{2}{3}+13\frac{5}{9}=\frac{38}{3}+\frac{122}{9}=\frac{38\times3}{3\times3}+\frac{122}{9}=\frac{114}{9}+\frac{122}{9}=\frac{236}{9}=26\frac{2}{9}$

b) $6\frac{5}{6}+4=10\frac{5}{6}$ c) $7+15\frac{3}{7}=22\frac{3}{7}$ d) $9\frac{1}{8}+4\frac{1}{5}=13\frac{13}{40}$

12. Velopoyga o‘tkaziladigan yo‘lning $3\frac{3}{8}$ km qismi shaharda va $5\frac{3}{4}$ km qismi shahar tashqarisida. Velopoyga yo‘lining jami uzunligi qancha? **Javob:** $3\frac{3}{8}+5\frac{3}{4}=9\frac{1}{8}$ km

13. Ibrohim sovg‘alarni tayyorlash uchun $5\frac{1}{3}$ m yashil va $4\frac{1}{4}$ m qizil tasma olib keldi. Jami qancha tasma olib kelingan? **Javob:** $5\frac{1}{3}+4\frac{1}{4}=9\frac{7}{12}$ m.

14. Yorqin bog‘dan $5\frac{3}{5}$ kg uzum va $4\frac{3}{10}$ kg gilos terdi. U jami necha kg meva tergan?

Javob: $5\frac{3}{5}+4\frac{3}{10}=5\frac{6}{10}+4\frac{3}{10}=9\frac{9}{10}$ km.

15. Binolar orasidagi jami masofa necha kilometr? **Yechish:** $4\frac{3}{4}+6\frac{3}{8}+10\frac{5}{8}=21\frac{3}{4}$ km.

16. Natijalarni taqqoslang.

a) $1\frac{5}{6}+1\frac{1}{2};5\frac{1}{2}-1\frac{3}{4}\Rightarrow3\frac{1}{3}<3\frac{3}{4}$

b) $5\frac{1}{3}-3\frac{1}{2}<4\frac{5}{12}-1\frac{5}{8}$ c) $4\frac{1}{4}-1\frac{1}{2}<2\frac{1}{4}+1\frac{1}{4}$

17. Ifodaning qiymatini toping.

a) $4\frac{3}{5}+2\frac{5}{7}+5\frac{9}{35}=11\frac{21+25+9}{35}=12\frac{4}{7}$

b) $1\frac{2}{3}+6\frac{4}{15}+8\frac{17}{45}=16\frac{14}{45}$

18. Ifodaning qiymatini toping.

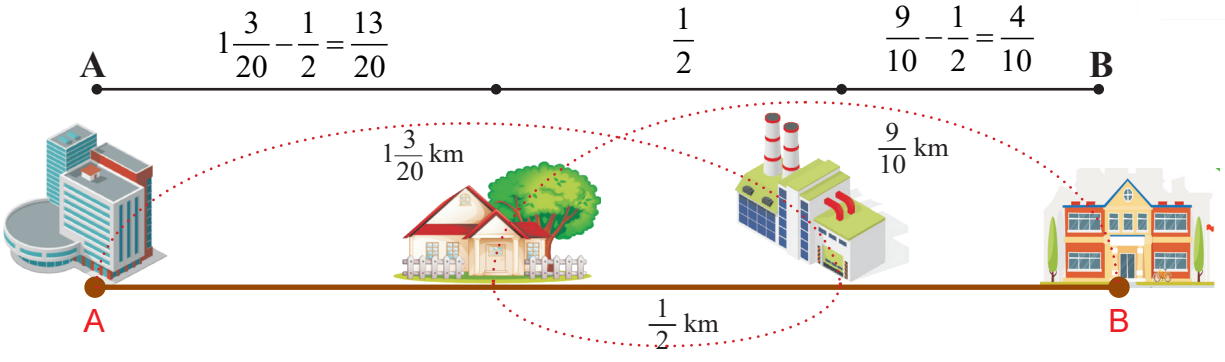
a) $\frac{31}{60}+\left(\frac{7}{20}+\frac{11}{60}\right)=1\frac{1}{20}$

b) $\frac{53}{54}-\left(\frac{1}{6}+\frac{7}{9}\right)=\frac{53}{54}-\frac{51}{54}=\frac{1}{27}$

c) $\frac{13}{35}+\left(\frac{23}{35}-\frac{2}{7}\right)=\frac{13}{35}+\frac{13}{35}=\frac{26}{35}$

d) $\frac{7}{16}-\left(\frac{3}{4}-\frac{5}{16}\right)=\frac{7}{16}-\frac{7}{16}=0$

19. A binodan B binogacha bo‘lgan masofa qancha?



$AB=\frac{13}{20}+\frac{4}{10}+\frac{1}{2}=\frac{13+8+10}{20}=\frac{31}{20}=1\frac{11}{20}$

20. Ketma-ketlikdagi qonuniyatni toping va keyingi sonni aniqlang.

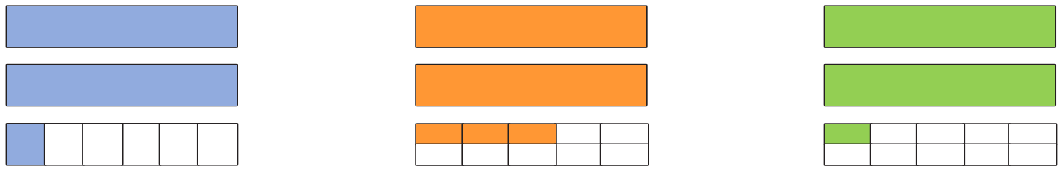
$\frac{1}{3}$ $\frac{1}{2}$ $\frac{1}{5}$ $\frac{1}{4}$ $\frac{1}{7}$ $\frac{1}{8}$ $\frac{1}{9}$ $\frac{1}{16}$ $\frac{1}{11}$ $\frac{1}{32}$ $\frac{1}{13}$

21. Aralash sonlarni qo‘shing.

a) $11\frac{7}{15}+4\frac{1}{3}=15\frac{4}{5}$ b) $7\frac{2}{5}+3\frac{3}{10}=10\frac{7}{10}$ c) $5\frac{5}{12}+2\frac{1}{4}=7\frac{2}{3}$ d) $4\frac{3}{8}+1\frac{1}{4}=5\frac{5}{8}$

22. Quyidagi ayirmalar natijalariga mos shakllarni toping.

b) $4\frac{2}{3}-2\frac{2}{4}=2\frac{1}{6}$ c) $5\frac{2}{4}-3\frac{1}{5}=2\frac{3}{10}$ a) $6\frac{3}{5}-4\frac{4}{8}=2\frac{1}{10}$



23. Zarifda $5\frac{2}{5}$ kg va Zafarda $4\frac{3}{8}$ kg bodom bor. Zarifda necha kg bodom ko‘p?

Yechish: $5\frac{2}{5}-4\frac{3}{8}=1\frac{1}{40}$ kg.

Javob: $1\frac{1}{40}$ kg ko‘p.

SUMMATIV BAHOLASH. 1-NAZORAT ISHI

1-variant

1. $\frac{21}{28}; \frac{40}{48}; \frac{21}{42}$ kasrlarni qisqartiring. Hosil bo‘lgan kasrlarni bir xil maxrajga keltiring.

2. $\frac{3}{5}; \frac{3}{4}; \frac{5}{8}$ kasrlarni taqqoslang.

3. Kasrlarni qo‘shing: $\frac{5}{18}+\frac{7}{24}+\frac{11}{36}=?$

4. Kasrlarni ayiring: $\frac{23}{27}-\frac{11}{18}-\frac{1}{9}=?$

5. Amallarni bajaring: $\left(3\frac{5}{9}+2\frac{7}{8}\right)-\left(2\frac{7}{8}+1\frac{2}{9}\right)+\left(2\frac{6}{9}+5\frac{3}{8}\right)$

2-variant

1. $\frac{15}{25}; \frac{7}{14}; \frac{18}{27}$ kasrlarni qisqartiring va bir xil maxrajga keltiring.

2. $\frac{3}{7}; \frac{2}{5}; \frac{1}{3}$ kasrlarni taqqoslang.

3. Kasrlarni qo‘shing: $\frac{4}{13}+\frac{7}{26}+\frac{11}{39}=?$

4. Kasrlarni ayiring: $\frac{23}{24}-\frac{5}{18}-\frac{7}{12}=?$

5. Amallarni bajaring: $\left(6\frac{6}{7}+4\frac{3}{4}\right)+\left(1\frac{1}{3}+2\frac{5}{7}\right)-\left(\frac{1}{3}+4\frac{3}{4}\right)$

II BOB. KASRLARNI KO‘PAYTIRISH VA BO‘LISH

Kasrlarni ko‘paytirish

Barcha o‘quvchilar	$\frac{2}{3}\times\frac{5}{7}$ ko‘rinishidagi misollarni yechadi.
Aksariyat o‘quvchilar	Kasrlarga doir misollar yechadi.
Ba’zi o‘quvchilar	Kasrlarga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Kasrlarning necha turi mavjud?
2. “To‘g‘ri kasr” deb nimaga aytamiz?
3. “Noto‘g‘ri kasr” deb qanday kasrga aytiladi va unga misol keltira olasizmi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

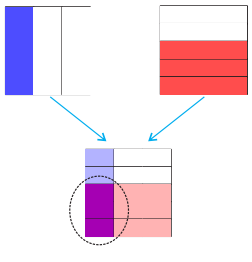
O‘quvchilar odatda kasrlarga doir misollarda butun sonni yo suratga, yo maxrajga ko‘paytirishga tushunmay qolishadi, ko‘p xato qilishadi, kasrlarni hayotiy masalalarga bog‘lab yechishga qiynaladilar. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uy vazifa*

20-, 21-22-misollar (41-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Model yordamida kasrlarni hosil qiling va ularni ko‘paytiring.



$$\frac{1}{3}\times\frac{3}{5}=\frac{3}{15}=\frac{1}{5}$$

2. Hisoblang.

a) $\frac{1}{2}\times\frac{1}{3}=\frac{1\times1}{2\times3}=\frac{1}{6}$ b) $\frac{2}{3}\times\frac{5}{7}=\frac{10}{21}$ c) $\frac{2}{5}\times\frac{1}{3}=\frac{2}{15}$ d) $\frac{35}{40}\times\frac{4}{7}=\frac{1}{2}$

3. Bog‘bon ikki kunda jami necha ar yerni shudgor qildi?

Birinchi kuni: $\frac{8}{9}$ ar



Ikkinchi kuni: ?, $\frac{3}{2}$ marta ko‘p

Yechish: 1-kun: $\frac{8}{9}$ *ar* 2-kun: $\frac{8}{9}\times\frac{3}{2}=1\frac{1}{3}$

Jami: $1\frac{1}{3}+\frac{8}{9}=\frac{4}{3}+\frac{8}{9}=\frac{12+8}{9}=\frac{20}{9}=2\frac{2}{9}$ ar. **Javob:** $2\frac{2}{9}$ ar.

4. Hisoblang.

a) $5\times\frac{2}{11}=\frac{10}{11}$ b) $3\times\frac{4}{13}=\frac{12}{13}$ c) $4\times\frac{2}{17}=\frac{8}{17}$ d) $\frac{7}{32}\times4=\frac{7}{8}$

5. Shakllarning perimetri va yuzini toping.

1) $P=4\times\frac{1}{5}=\frac{4}{5}$; $S=\frac{1}{5}\times\frac{1}{5}=\frac{1}{25}$; 2) $P=\left(\frac{2}{3}+\frac{1}{4}\right)\times2=1\frac{5}{6}$; $S=\frac{2}{3}\times\frac{1}{4}=\frac{1}{6}$;

3) $P=\left(\frac{4}{9}+\frac{3}{4}\right)\times2=2\frac{7}{18}$; $S=\frac{4}{9}\times\frac{3}{4}=\frac{1}{3}$.

6. Daftarga 3 ta $\frac{3}{10}$ dm li va 5 ta $\frac{7}{10}$ dm li kesmalar chizildi. Chizilgan barcha kesmalar ketma-ket qo‘yilsa, qanday uzunlikdagi kesma hosil bo‘ladi?

Yechish: $3\times\frac{3}{10}+5\times\frac{7}{10}=\frac{9}{10}+\frac{35}{10}=4\frac{2}{5}$.

7. Bo‘sh kataklarga qanday amallar qo‘yilsa, natija nolga teng bo‘ladi?

–	$\frac{1}{2}$	–
$\frac{3}{4}$		$\frac{5}{8}$
+		=
$\frac{3}{8}$		0

$\frac{1}{6}$	×	$\frac{2}{3}$	–	$\frac{1}{9}$	=	0

$\frac{1}{4}$	+	$\frac{1}{6}$
		+
$\frac{1}{3}$	–	$\frac{2}{3}$
–		
$\frac{3}{4}$	=	0

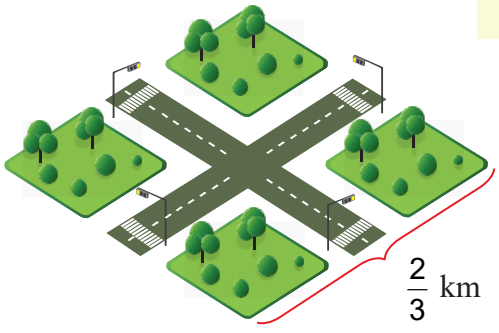
8. Kasrlarni ko‘paytiring.

a) $\frac{18}{23}\times\frac{7}{9}=\frac{14}{23}$ b) $\frac{5}{12}\times\frac{3}{4}=\frac{5}{16}$ c) $\frac{8}{21}\times\frac{7}{12}=\frac{2}{9}$ d) $\frac{13}{18}\times\frac{9}{26}=\frac{1}{4}$

9. Hisoblang va taqqoslang.

a) $20\times\frac{3}{4}<30\times\frac{2}{3}$ b) $\frac{4}{7}\times21<\frac{7}{25}\times75$ c) $\frac{5}{42}\times12>\frac{3}{49}\times14$

10. Maydon kvadrat shaklida. Uning yuzi necha km^2?



Yechish: $S = \frac{2}{3} \times \frac{2}{3} = \frac{4}{9}$ km^2.

11. Ifodalarning qiymatini toping.

a) $\frac{42}{45} \times \frac{15}{28} + 3\frac{4}{5} = \frac{1}{2} + 3\frac{4}{5} = \frac{5}{10} + 3\frac{8}{10} = 3\frac{13}{10} = 4\frac{3}{10}$.

b) $7\frac{8}{21} - \frac{18}{49} \times \frac{14}{27} = 7\frac{8}{21} - \frac{4}{21} = 7\frac{4}{21}$.

12. Bo‘sh kataklarni to‘ldiring.

a) $\square \times \frac{3}{14} = \frac{3}{2}$ b) $\square \times \frac{7}{6} = 21$ c) $\frac{1}{6} \times \square = 3$ d) $\square \times 5 = \frac{2}{3}$ e) $\square \times 24 = 16$

Javoblar: a) 7 b) 18 c) 18 d) $\frac{2}{15}$ e) $\frac{16}{24}$

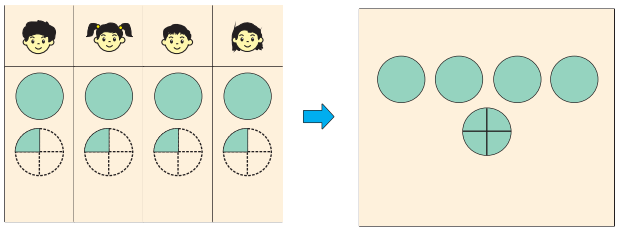
13. To‘g‘ri to‘rtburchaklarning bo‘yalgan va bo‘yalmagan qismlarini kasrlarda ifodalab, ko‘paytiring.

$\frac{5}{10} \times \frac{5}{10} = \frac{1}{4}$ $\frac{8}{10} \times \frac{2}{10} = \frac{4}{25}$ $\frac{4}{10} \times \frac{6}{10} = \frac{6}{25}$

a) b) c)



16*. Rasm asosida masala tuzing.



Ushbu topshiriqni yuqori natijaga erishayotgan o‘quvchilarga qo‘shimcha topshiriq sifatida berish tavsiya etiladi. O‘quvchilar mustaqil ravishda natural sonni kasrga yoki aralash sonni natural songa ko‘paytirishga doir masalalar tuzishi mumkin.

17. Ifodalarning qiymatini toping va taqqoslang.

a) $\frac{7}{8} - \frac{3}{4} + \frac{1}{2} \bigcirc \frac{1}{3} + \frac{5}{6} - \frac{1}{2}$ b) $\frac{2}{3} \times \frac{7}{8} \times \frac{2}{7} \bigcirc \frac{4}{5} - \frac{3}{5} \times \frac{1}{6}$

18. Ifodalarning qiymatini toping va taqqoslang.

$\frac{5}{34}\times\frac{17}{45}+\frac{11}{45}\ (<)\ \frac{5}{12}+\frac{8}{45}\times\frac{5}{12}$ $\qquad$ $\frac{5}{7}\times\frac{14}{15}-\frac{3}{7}\ (<)\ \frac{8}{15}+\frac{5}{7}\times\frac{2}{15}$

19. Shakllarning hajmi va to‘la sirti yuzini toping.

a) $V=\frac{3}{8}\times\frac{3}{16}\times\frac{1}{4}=\frac{9}{512}$ $\qquad$ $S=2\times\left(\frac{3}{8}\times\frac{3}{16}+\frac{3}{16}\times\frac{1}{4}+\frac{3}{8}\times\frac{1}{4}\right)=\frac{27}{64}$

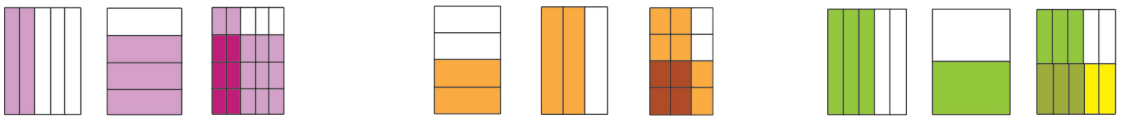
b) $V=\frac{55}{432}$ $\quad$ $S=\frac{19}{9}$ $\qquad$ c) $V=\frac{27}{250}$ $\quad$ $S=\frac{42}{25}$ $\qquad$ d) $V=\frac{26}{1125}$ $\quad$ $S=\frac{194}{225}$

22. To‘g‘ri to‘rtburchakning bo‘yi $\frac{3}{4}$ dm, eni esa undan $\frac{1}{8}$ dm qisqa. To‘g‘ri to‘rtburchakning perimetri va yuzini toping.

Yechish: $\qquad$ Bo‘yi $=\frac{3}{4}$ $\qquad$ Eni $=\frac{3}{4}-\frac{1}{8}=\frac{3\times2-1}{8}=\frac{5}{8}$

$p=2\times\left(\frac{3}{4}+\frac{5}{8}\right)=\frac{2}{1}\times\frac{2\times3+5}{8}=\frac{2}{1}\times\frac{11}{8}=\frac{11}{4}=2\frac{3}{4}$ $\qquad$ $S=\frac{3}{4}\times\frac{5}{8}=\frac{15}{32}$

23. Modellar asosida ko‘paytirishni bajaring.



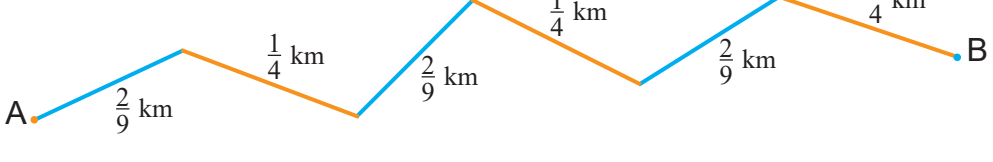
a) $\frac{2}{5}\times\frac{3}{4}=\frac{2\times3}{5\times4}=\frac{6}{20}=\frac{3}{10}$ $\qquad$ b) $\frac{2}{4}\times\frac{2}{3}=\frac{2\times2}{4\times3}=\frac{4}{12}=\frac{1}{6}$ $\qquad$ c) $\frac{3}{5}\times\frac{1}{2}=\frac{3\times1}{5\times2}=\frac{3}{10}$

24. Bir dona pishiriq tayyorlash uchun $\frac{1}{3}$ piyola sut ishlatiladi. 20 dona pishiriq tayyorlash uchun qancha sut kerak bo‘ladi?

Yechish: $\frac{1}{3}\times20=\frac{1\times20}{3\times1}=\frac{20}{3}=6\frac{2}{3}$.

25. A dan B shahargacha bo‘lgan masofa siniq chiziq bo‘ylab necha kilometr?

Yechish: $\frac{2}{9}+\frac{1}{4}+\frac{2}{9}+\frac{1}{4}+\frac{2}{9}+\frac{1}{4}=\frac{2}{9}\times3+\frac{1}{4}\times3=\frac{2\times3}{9}+\frac{1\times3}{4}=\frac{2}{3}+\frac{3}{4}=\frac{17}{12}=1\frac{5}{12}$



27. Bo‘sh joylarni to‘ldiring.

Namuna: a) $\frac{1}{3}\times\frac{1}{2}=\frac{1\times1}{3\times2}=\frac{1}{6}$ $\qquad$ $\frac{1}{3}\times\frac{7}{8}=\frac{1\times7}{3\times8}=\frac{7}{24}$ $\qquad$ $\frac{1}{3}\times\frac{3}{5}=\frac{1\times3}{3\times5}=\frac{1}{5}$

Aralash sonlarni ko‘paytirish

Barcha o‘quvchilar	Aralash sonlarni ko‘paytiradi.
Aksariyat o‘quvchilar	Aralash sonlarga doir misollar yechadi.
Ba’zi o‘quvchilar	Aralash sonlarga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Aralash sonlarni noto‘g‘ri kasrga aylantirganda surat katta bo‘ladimi, maxrajmi?
2. “Aralash son” deb nimaga aytamiz?
3. Hayotda aralash kasrlarga duch kelamizmi? Misollar ayting-chi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrlarga doir misollarda butun sonni yo suratga, yo maxrajga ko‘paytirishga tushunmay qolishadi va ko‘p xato qilishadi, aralash sonni noto‘g‘ri kasrga aylantirishda butun sonni yo maxrajga, yo suratga ko‘paytirishga, kasrlarni hayotiy masalalarga bog‘lab yechishga qiynaladilar. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shunga ko‘proq e’tibor qaratishi lozim.

➢ *Uyga vazifa*

11-12-, 16-misollar (44-bet)

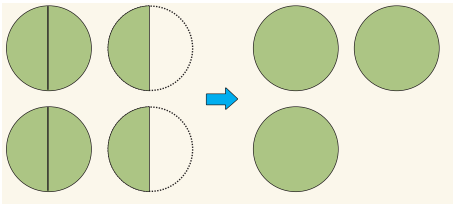
➢ *Mashqlar, ularning javoblari va yechimlari*

1. Aralash sonlarni ko‘paytiring.

a) $1\frac{1}{4}\times1\frac{2}{7}=\frac{5}{4}\times\frac{9}{7}=\frac{5\times9}{4\times7}=\frac{45}{28}=1\frac{17}{28}$

b) $5\frac{13}{15}$

2. Model asosida ko‘paytmani toping.



Yechish: $1\frac{1}{2}\times2=\frac{3}{2}\times\frac{2}{1}=\frac{3\times2}{2\times1}=\frac{3}{1}=3$

3. Hisoblang.

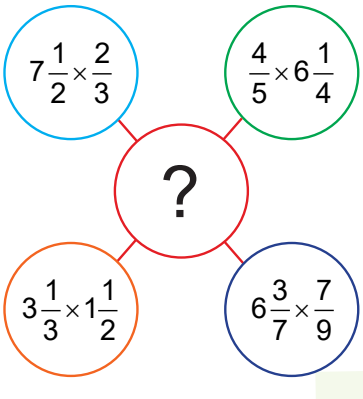
a) $7\times1\frac{2}{14}=\frac{7}{1}\times\frac{16}{14}=\frac{7\times16}{1\times14}=\frac{1\times16}{1\times2}=\frac{16}{2}=8$

b) $6\frac{3}{4}$ c) 52 d) $31\frac{2}{3}$

4. Noma’lum son nechaga teng?

a) $7\frac{1}{2}\times\frac{2}{3}=\frac{15}{2}\times\frac{2}{3}=\frac{15\times2}{2\times3}=\frac{15}{3}=5$

b) 5 c) 5 d) 5



5. Aralash sonlarni ko‘paytiring.

a) $1\frac{2}{4}\times 3\frac{5}{6}=\frac{6}{4}\times\frac{23}{6}=\frac{6\times 23}{4\times 6}=\frac{23}{4}=5\frac{3}{4}$ b) $2\frac{11}{22}$ c) 8 d) 11

6. Hisoblang va natijalarni taqqoslang.

Yechish: a)

$3\frac{2}{5}\times\frac{9}{17}=\frac{17}{5}\times\frac{9}{17}=\frac{17\times 9}{5\times 17}=\frac{9}{5}=1\frac{4}{5}$ $\frac{11}{28}\times 6\frac{4}{11}=\frac{11}{28}\times\frac{70}{11}=\frac{11\times 70}{28\times 11}=\frac{70}{28}=\frac{70}{28}=\frac{5}{2}=2\frac{1}{2}$

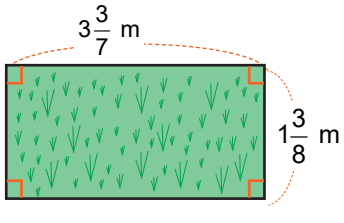
$1\frac{4}{5}<2\frac{1}{2}$

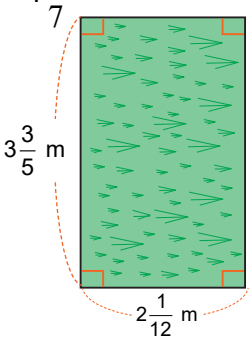
b) $4=4$ c) $\frac{2}{3}<92$

7. Berilgan ma’lumotlar asosida maydonlarning perimetri va yuzini toping.

a) $p=2\times\left(3\frac{3}{7}+1\frac{3}{8}\right)=2\times\left(\frac{24}{7}+\frac{11}{8}\right)=\frac{2}{1}\times\frac{24\times 8+11\times 7}{56}=\frac{2}{1}\times\frac{269}{56}=\frac{269}{56}=9\frac{17}{28}$

$S=3\frac{3}{7}\times 1\frac{3}{8}=\frac{24}{7}\times\frac{11}{8}=\frac{24\times 11}{7\times 8}=\frac{3\times 11}{7}=\frac{33}{7}=4\frac{5}{7}$





8. Ifodalar tuzing va qiymatini toping.

a) $4\frac{2}{9}\times\left(3\frac{1}{3}+5\frac{2}{3}\right)=\frac{38}{9}\times\left(\frac{10}{3}+\frac{17}{3}\right)=\frac{38}{9}\times\frac{27}{3}=\frac{38\times 27}{9\times 3}=38$ b) 21

9. Ikkala sisternada jami qancha benzin bor?

1-sisternada: $2\frac{1}{10}$ 2-sisternada: $2\frac{1}{10}\times 3\frac{1}{3}=\frac{21}{10}\times\frac{10}{3}=\frac{21\times 10}{10\times 3}=\frac{21}{3}$

Jami: $2\frac{1}{10}+7=2+\frac{1}{10}+7=9+\frac{1}{10}=9\frac{1}{10}$

$2\frac{1}{10}$ tonna





?, $3\frac{1}{3}$ marta ko‘p

10. Amallarni bajaring.

a)

$$\frac{77}{6}+\frac{25}{9}\times\left(\frac{159}{10}-\frac{129}{10}\right)=\frac{77}{6}+\frac{25}{9}\times\frac{30}{10}=\frac{77}{6}+\frac{5\times10}{3\times2}=\frac{77}{6}+\frac{25}{3}=\frac{77+25\times2}{6}=\frac{127}{6}=21\frac{1}{6}$$

b) $79\frac{3}{8}$ c) 55 d) $11\frac{2}{7}$

11. Hisoblang.

a) $\frac{15}{4}\times\frac{29}{9}=\frac{15\times29}{4\times9}=\frac{5\times29}{4\times3}=\frac{145}{12}=12\frac{1}{12}$ b) $9\frac{7}{12}$ c) $5\frac{1}{4}$ d) $5\frac{1}{3}$

12. Bir idishda $1\frac{4}{5}$ litr suv bor edi. Halim shunday suvdan 8 ta sotib oldi. U necha litr suv sotib olgan?

Yechish: $1\frac{4}{5}\times8=\frac{9}{5}\times\frac{8}{1}=\frac{72}{5}=14\frac{2}{5}$

13. Jadvalni to‘ldiring.

ko‘paytiring →

ko‘paytiring ↓

$1\frac{2}{3}$	$4\frac{4}{5}$	8
$3\frac{3}{4}$	$2\frac{2}{15}$	8
$6\frac{1}{4}$	$10\frac{6}{25}$	

14. Natijalarni taqqoslang.

a) $3\times1\frac{3}{8}=\frac{3}{1}\times\frac{11}{8}=\frac{3\times11}{1\times8}=\frac{33}{8}=4\frac{1}{8}$;

$3\times2\frac{1}{2}=\frac{3}{1}\times\frac{5}{2}=\frac{3\times5}{1\times2}=\frac{15}{2}=7\frac{1}{2}$;

$4\frac{1}{8}<7\frac{1}{2}$.

b) 62>22 c) 52>34

Sonning qismini topish

Barcha o‘quvchilar	Sonning qismini topadi.
Aksariyat o‘quvchilar	Butunning qismini topish yoki kasrlarning qismini topishga o‘xshash misollar yechadi.
Ba’zi o‘quvchilar	$5\frac{2}{3}$ ning $1\frac{3}{7}$ qismini topish kabi misol va masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Butun sonning qismi deganda nimani tushunasiz?
2. 36 ning chorak qismi nechaga teng?
3. 36 ning 9 dan 3 qismi nechaga teng?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda sonning qismini topishga doir misollarda butun sonni yo suratga, yo maxrajga ko‘paytirishga tushunmay qoladilar va xato qiladilar, aralash sonni noto‘g‘ri kasrga aylantirib, qismini topishda kasrlarni hayotiy masalalarga bog‘lab yechishda qiynalishadi. Bu holatning oldini olish uchun o‘quvchi avvalo noto‘g‘ri kasrni yaxshi tushunib olishi, keyin qismning surat, maxrajlarini to‘laqonli o‘rganishi, maxrajni suratga, suratni maxrajga aylantirishga ko‘proq e’tibor qaratishi lozim.

➢ *Uyga vazifa*

17-, 21-22-misollar (47-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Sonlarning $\frac{1}{2}$ qismini toping.

$10\times\frac{1}{2}=\frac{10}{2}=5$; 10; 15; 20; 25; 30; 35; 40; 45; 50.

2. Bo‘sh kataklarni to‘ldiring.

a) $20\times\frac{4}{5}=\frac{20\times4}{5}=\frac{4\times4}{1}=16$ b) 40 c) $\frac{3}{5}$ d) 60

3. Aralash sonlarning qismini toping.

a) $2\frac{2}{3}\times\frac{3}{5}=\frac{8}{3}\times\frac{3}{5}=\frac{8\times3}{3\times5}=\frac{8}{5}=1\frac{3}{5}$ b) $1\frac{1}{6}$ c) $1\frac{1}{2}$

4. Kesmaning uzunligi necha santimetr? Uning qanday qismlarini topa olasiz?

O‘quvchilarga kesmani chizg‘ich orqali o‘lchashlarini ayting. Ular o‘lchangan kesmaning yarmini, choragini, uchdan birini topishlari kerak. Bundan boshqa qismlarni topish uchun yo‘llanma bering.



5. Do‘konga keltirilgan 136 ta tarvuzning $\frac{3}{8}$ qismi birinchi kuni, $\frac{5}{17}$ qismi ikkinchi kuni sotildi. Do‘konda nechta tarvuz qolgan?

1-kun: $136\times\frac{3}{8}=\frac{136\times3}{8}=\frac{17\times3}{1}=51$ 2-kun: $136\times\frac{5}{17}=\frac{136\times5}{17}=\frac{8\times5}{1}=40$

Do‘konda qolgan tarvuzlar: $136-(51+40)=45$

6. a) 30 ning $\frac{5}{6}$ qismiga 75 ning $\frac{7}{15}$ qismini qo‘shing.

b) 180 ning $\frac{13}{18}$ qismidan 115 ning $\frac{17}{23}$ qismini ayiring.

a) $30\times\frac{5}{6}+75\times\frac{7}{15}=\frac{30\times5}{6}+\frac{75\times7}{15}=\frac{5\times5}{1}+\frac{5\times7}{1}=25+35=60$ b) 45

7. Hisoblang.

a) 56 ning $\frac{3}{7}$ qismining $\frac{1}{4}$ qismi b) 91 ning $\frac{11}{13}$ qismining $\frac{2}{7}$ qismi

c) 780 ning $\frac{7}{12}$ qismining $\frac{11}{13}$ qismi d) 798 ning $\frac{12}{19}$ qismining $\frac{5}{14}$ qismi

a) $56\times\frac{3}{7}\times\frac{1}{4}=\frac{56\times3\times1}{7\times4}=\frac{2\times3\times1}{1}=6$ b) 22 c) 385 d) 180

8. Aralash sonlarning qismini toping.

a) $5\frac{1}{25}$ ning $\frac{25}{42}$ qismi b) $3\frac{4}{7}$ ning $\frac{21}{25}$ qismi

c) $3\frac{2}{3}$ ning $1\frac{1}{11}$ qismi d) $\frac{13}{20}$ ning $3\frac{1}{3}$ qismi

a) $5\frac{1}{25}\times\frac{25}{42}=\frac{126}{25}\times\frac{25}{42}=\frac{126\times25}{25\times42}=\frac{126}{42}=3$ b) 3 c) 4 d) $2\frac{1}{6}$

17. Hisoblang.

a) 80 ning $\frac{17}{20}$ qismi b) 100 ning $\frac{21}{25}$ qismi c) 77 ning $\frac{3}{11}$ qismi

d) 540 ning $\frac{19}{27}$ qismi e) 533 ning $\frac{5}{13}$ qismi f) 434 ning $\frac{11}{14}$ qismi

a) $80\times\frac{17}{20}=\frac{80\times17}{20}=\frac{4\times17}{1}=68$ b) 84; c) 21; d) 380; e) 205; f) 341.

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19. Kutubxonada 1250 ta kitob bor. Bu kitoblaring $\frac{2}{5}$ qismi o‘zbek tilida, $\frac{3}{10}$ qismi rus tilida, $\frac{1}{5}$ qismi ingliz tilida, qolganlari nemis tilida bo‘lsa, har bir tilda qanchadan kitob bor?

O‘zbekcha: $1250\times\frac{2}{5}=\frac{1250\times2}{5}=\frac{250\times2}{1}=500$

Ruscha: $1250\times\frac{3}{10}=\frac{1250\times3}{10}=\frac{125\times3}{1}=375$

Inglizcha: $1250\times\frac{1}{5}=\frac{1250\times1}{5}=\frac{250\times1}{1}=250$

Nemischa: 1250 – 500 – 375 – 250 = 125

20. Muqaddas tug‘ilgan kunida dugonalari uchun 72 ta shokolad olib keldi. Hamma ketgandan keyin shokoladlarning $\frac{1}{3}$ qismi qolganini ko‘rdi. Muqaddasda qancha shokolad qolgan? **Yechish:** $72\times\frac{1}{3}=\frac{72\times1}{3}=\frac{24\times1}{1}=24$

21. 1) 30 ning $\frac{5}{6}$ qismiga 75 ning $\frac{7}{15}$ qismini qo‘shing.

2) 800 ning $\frac{3}{4}$ qismidan 660 ning $\frac{7}{11}$ qismini ayiring.

1) $30\times\frac{5}{6}+75\times\frac{7}{15}=\frac{30\times5}{6}+\frac{75\times7}{15}=\frac{5\times5}{1}+\frac{5\times7}{1}=25+36=61$ 2) 180

22. Urganchdan Toshkentgacha bo‘lgan masofa 1000 km. Olim bu masofani turli transportlarda bosib o‘tdi. U har bir transportda necha kilometrdan yo‘l yurgan?

Yechish: velosipedda $1000\times\frac{1}{8}=\frac{1000\times1}{8}=\frac{125\times1}{1}=125$ km

Mashinada: 375 km

Poyezdda: 500 km



$\frac{1}{8}$ qismi



$\frac{3}{8}$ qismi



$\frac{1}{2}$ qismi

Qulay usulda hisoblash

Barcha o‘quvchilar	Kasrlarni ko‘paytirishda qulay usullardan foydalanib hisoblaydi.
Aksariyat o‘quvchilar	Qulay usullardan foydalanib misollar yechadi.
Ba’zi o‘quvchilar	Bir vaqtda ko‘paytirish va qo‘shishning barcha xossalarini qo‘llay oladi.

➢ *Faollashtiruvchi savollar*

1. Qulay usuldan foydalanish deganda nimani tushunasiz?
2. O‘rin almashtirish xossasi nima?
3. Guruhlash xossasi hayotda nima uchun zarur?
4. Taqsimot qonuniga hayotiy misol keltira olasizmi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrlarga doir misollarda aralash sonni noto‘g‘ri kasrga aylantirishda butun sonni yo suratga, yo maxrajga ko‘paytirishga tushunmay qolishadi. Kasrlarni hayotiy masalalarga bog‘lab yechishga qiynaladilar. Bu holatning oldini olish uchun avvalo noto‘g‘ri kasrni yaxshi tushunib olishlari, keyin sonning qismini topishda maxrajni suratga, suratni maxrajga aylantirishga ko‘proq e’tibor qaratishlari lozim.

➢ *Uyga vazifa*

6-, 14-15-misollar (50-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Tenglikning to‘g‘riligini tekshiring.

a) $\frac{4}{7}\times\frac{12}{13}=\frac{4\times12}{7\times13}=\frac{48}{91}$ va $\frac{12}{13}\times\frac{4}{7}=\frac{12\times4}{13\times7}=\frac{48}{91}$.

b) $\frac{133}{204}=\frac{133}{204}$ c) $23\frac{6}{11}=23\frac{6}{11}$

2. Hisoblang.

a) $14\times\left(\frac{5}{7}\times\frac{1}{2}\right)=\frac{14}{1}\times\frac{5}{7}\times\frac{1}{2}=\frac{14\times5\times1}{1\times7\times2}=5$ b) 3 c) 5

3. Hisoblang.

a) $2\times\left(3+\frac{1}{2}\right)=(2\times3)+\left(2\times\frac{1}{2}\right)=6+1=7$ b) 14 c) 14

4. Bo‘sh kataklarni to‘ldiring.

a) $\frac{20}{25}\times\frac{4}{5}=\frac{\boxed{4}}{\boxed{5}}\times\frac{\boxed{4}}{\boxed{5}}=\frac{\boxed{16}}{\boxed{25}}$

b) $\frac{16}{35}\times\left(\frac{15}{16}\times\frac{35}{150}\right)=\frac{\boxed{16}}{\boxed{35}}\times\frac{\boxed{15}}{\boxed{16}}\times\frac{\boxed{35}}{\boxed{150}}=\frac{\boxed{1}}{\boxed{10}}$

c) $\frac{16}{35}\times\left(\frac{15}{16}+\frac{35}{64}\right)=\left(\frac{\boxed{16}}{\boxed{35}}\times\frac{\boxed{15}}{\boxed{16}}\right)+\left(\frac{\boxed{16}}{\boxed{35}}\times\frac{\boxed{35}}{\boxed{64}}\right)=\frac{\boxed{3}}{\boxed{7}}+\frac{\boxed{1}}{\boxed{4}}=\frac{\boxed{12}+\boxed{7}}{\boxed{28}}=\frac{\boxed{19}}{\boxed{28}}$

5. Hisoblang.

a) $12\times3\frac{1}{8}=(12\times3)+\left(12\times\frac{1}{8}\right)=36+\frac{3}{2}=36+1\frac{1}{2}=36+1+\frac{1}{2}=37\frac{1}{2}$

b) 18 c) $10\frac{2}{7}$ d) $24\frac{1}{6}$

6. Qulay usul bilan hisoblang.

a) $6\frac{11}{24}\times\frac{4}{9}+2\frac{3}{14}\times\frac{4}{9}=\frac{4}{9}\times\left(6\frac{11}{14}+2\frac{3}{14}\right)=\frac{4}{9}\times\left(8+\frac{14}{14}\right)=\frac{4}{9}\times9=4$

b) 2 c) 83 d) $2\frac{1}{2}$

7. To‘g‘ri to‘rtburchakning bo‘yi $2\frac{7}{8}$ dm, eni esa $1\frac{3}{4}$ dm ga teng. Shu to‘g‘ri to‘rtburchakning perimetrini toping.

$p=\left(2\frac{7}{8}+1\frac{3}{4}\right)\times2=\left(\frac{23}{8}+\frac{7}{4}\right)\times2=\left(\frac{23}{8}+\frac{14}{8}\right)\times2=\frac{37}{8}\times2=\frac{37}{4}=9\frac{1}{4}$

8. Ifodaning qiymatini toping.

a) $2\frac{2}{11}\times\left(3\frac{1}{3}+5\frac{5}{6}\right)=\frac{24}{11}\times\left(\frac{10}{3}+\frac{35}{6}\right)=\frac{24}{11}\times\left(\frac{20}{6}+\frac{35}{6}\right)=\frac{24}{11}\times\frac{55}{6}=\frac{4\times5}{1\times1}=20$

b) 9 c) 14; $2\frac{1}{3}$ d) $13\frac{2}{3}$; $12\frac{3}{10}$

9. To‘g‘ri to‘rtburchakning eni $3\frac{5}{12}$ dm, bo‘yi esa enidan $1\frac{5}{6}$ dm ortiq. Uning perimetrini toping.

Yechish: Eni: $3\frac{5}{12}$ Bo‘yi: $3\frac{5}{12}+1\frac{1}{6}=3\frac{5}{12}+1\frac{1}{12}=4\frac{7}{12}$

$\left(3\frac{5}{12}+4\frac{7}{12}\right)\times2=7\frac{12}{12}\times2=8\times2=16$

11. Tenglikning to‘g‘riligini tekshiring.

a) $\left(\frac{2}{5}\times\frac{3}{4}\right)\times\frac{7}{13}=\frac{2\times3\times7}{5\times4\times13}=\frac{42}{260}=\frac{21}{130}$ $\frac{2}{5}\times\left(\frac{3}{4}\times\frac{7}{13}\right)=\frac{2\times3\times7}{5\times4\times13}=\frac{42}{260}=\frac{21}{130}$ $\frac{21}{130}=\frac{21}{130}$

b) $55\times\left(\frac{3}{5}+\frac{7}{11}\right)=55\times\frac{3}{5}+55\times\frac{7}{11}$

Javoblar: a) tenglik to‘g‘ri b) tenglik to‘g‘ri

Ko‘rsatma: qaysi xossalar qo‘llanganini o‘quvchilardan so‘rang.

13. Namuna asosida mos natijalarni toping.

1	$4\times\left(5+\frac{1}{4}\right)$
2	$7\times\left(2+\frac{3}{7}\right)$
3	$2\times\left(3-\frac{1}{2}\right)$
4	$\left(4-\frac{7}{9}\right)\times 9$
5	$56\times\left(\frac{9}{14}\times\frac{1}{2}\right)$
6	$\left(\frac{1}{2}\times\frac{3}{4}\right)\times 8$
7	$\left(\frac{24}{5}\times\frac{2}{3}\right)\times\frac{5}{4}$
8	$\frac{7}{3}\times\left(\frac{9}{7}\times 2\right)$

a	17
b	18
c	4
d	3
e	21
f	6
g	5
h	29

14. Hisoblang.

a) $\frac{5}{8}\times\left(7\times\frac{4}{5}\right)=7\times\left(\frac{5}{8}\times\frac{4}{5}\right)=7\times\frac{1}{2}=\frac{7}{2}=3\frac{1}{2}$;

b) $\left(\frac{2}{5}\times 7\right)\times\frac{15}{2}=21$;

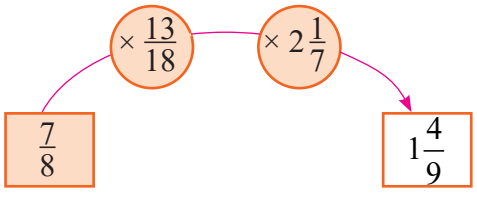
c) $5\times 6+\frac{1}{3}\times 6=30+2=32$;

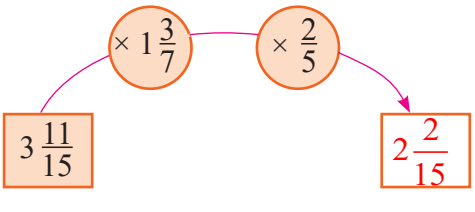
d) $7\times\left(5-\frac{3}{7}\right)=32$;

e) $8\times 13-\frac{11}{13}\times 13=104-11=93$;

f) $\left(\frac{2}{5}\times\frac{3}{4}\right)\times 2=\frac{3}{5}$;

15. Hisoblang.





O‘zaro teskari sonlar

Barcha o‘quvchilar	O‘zaro teskari sonlarni farqlay oladi.
Aksariyat o‘quvchilar	O‘zaro teskari sonlarni topa oladi va misollar yecha oladi.
Ba’zi o‘quvchilar	O‘zaro teskari sonlardan foydalanib masalalarni yecha oladi.

➢ *Faollashtiruvchi savollar*

1. O‘zaro teskari deganda nimani tushunasiz?
2. O‘zaro teskari sonni ko‘paytirsa qanday son hosil bo‘ladi?
3. O‘zaro teskari sonlarga misollar ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda misollar yechishda aralash sonlarning o‘zaro teskari sonlariga qiynaladilar. Bu holatning oldini olish uchun avvalo o‘quvchi noto‘g‘ri kasrni yaxshi tushunib olishi, keyin sonning teskarisini topishda maxrajni suratga, suratni maxrajga aylantirishga ko‘proq e’tibor qaratishi lozim.

➢ *Uyga vazifa*

11-, 12-13-misollar (52-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Berilgan sonlarga teskari sonni toping: $\frac{3}{4}$; $\frac{5}{8}$; $\frac{4}{15}$; $1\frac{2}{3}$; $2\frac{5}{6}$; $\frac{15}{4}$; $\frac{1}{7}$; $\frac{1}{25}$.

Javob: $\frac{4}{3}$; $\frac{8}{5}$ yoki $1\frac{3}{5}$; $\frac{15}{4}$ yoki $3\frac{3}{4}$; $\frac{3}{5}$; $\frac{6}{17}$; $\frac{4}{15}$; $\frac{7}{1}$ yoki 7; $\frac{25}{1}$ yoki 25.

Eslatma: *agar oddiy kasrga teskari kasr noto‘g‘ri kasr bo‘lsa, uni aralash songa aylantirib qo‘yishni, bu o‘zaro teskari sonlar bir-biriga teng emasligini o‘quvchilarga eslating.*

2. Quyidagi sonlarga teskari sonlarni toping.

a) 4 b) 5 c) 10 d) 150

Javob: $\frac{1}{4}$; $\frac{1}{5}$; $\frac{1}{10}$; $\frac{1}{150}$.

4. Quyidagi sonlarga teskari sonlarni toping.

a) 2 b) 6 c) 40 d) 200 e) $\frac{1}{50}$ f) $\frac{1}{200}$

Javob: a) $\frac{1}{2}$; b) $\frac{1}{6}$ c) $\frac{1}{40}$; d) $\frac{1}{200}$; e) 50 f) 20.

5. Kasrlarga o‘zaro teskari kasrlarni toping va natijalarni taqqoslang.

Javob: a) $4\frac{2}{3}=\frac{14}{3}\neq\frac{3}{14}$ $1\frac{3}{4}=\frac{7}{4}\neq\frac{4}{7}=\frac{8}{14}$ $\frac{3}{14}<\frac{8}{14}$; b) $\frac{20}{105}>\frac{18}{105}$.

6. Sonning qismini va unga teskari sonni toping.

a) $15\frac{3}{4}$ sonining $\frac{1}{9}$ qismi b) $32\frac{3}{5}$ sonining $\frac{5}{17}$ qismi

Javob: a) $15\frac{3}{4}\times\frac{1}{9}=\frac{63}{4}\times\frac{1}{9}=\frac{63\times1}{4\times9}=\frac{7\times1}{4\times1}=\frac{7}{4}$ $\frac{7}{4}\neq\frac{4}{7}$; b) $\frac{163}{17}\neq\frac{17}{163}$.

7. Amallarni bajaring va natijaga teskari sonni toping.

Javob: a) $2\frac{3}{5}+3\frac{1}{4}=\frac{13}{5}+\frac{13}{4}=\frac{13\times4+13\times5}{20}=\frac{117}{20}$ $\frac{109}{36}\neq\frac{36}{109}$;

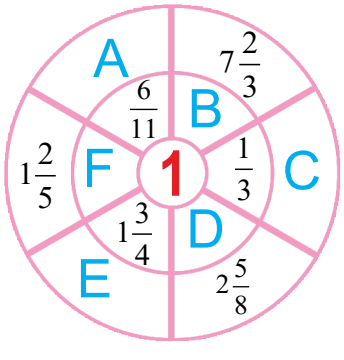
b) $\frac{109}{36}\neq\frac{36}{109}$; c) $\frac{4}{3}\neq\frac{3}{4}$; d) $\frac{41}{34}\neq\frac{34}{41}$; e) $7\neq\frac{1}{7}$; f) $14\neq\frac{1}{14}$.

Ko‘rsatma: *(≠) belgisining o‘ng tomonidagi son ifodaning natijasi, chap tomonidagisi unga teskari son.*

8. O‘zaro teskari sonlardan birini k marta orttirsak, ko‘paytma o‘zgarmasligi uchun ikkinchi sonni nechaga ko‘paytirish (yoki bo‘lish) kerak?

Yechish: o‘zaro teskari sonlarning ko‘paytmasi har doim 1 ga teng. A va B sonlar o‘zaro teskari sonlar bo‘lsin. A ni k marta orttitib, B ga ko‘paytirilganda ko‘paytma 1 ga teng chiqishi uchun, B ni k ga bo‘lish kerak.

Javob: ikkinchi sonni k ga bo‘lish kerak.



9. O‘zaro teskari sonlar ko‘paytmasi 1 ga tengligidan foydalanib A, B, C, D, E va F harflarning o‘rnida bo‘lishi kerak bo‘lgan sonlarni toping.

Javob: A = $1\times\frac{11}{6}=\frac{11}{6}$ B = $\frac{3}{23}$; C = 3;

D = $\frac{8}{21}$; E = $\frac{4}{7}$; F = $\frac{5}{7}$;

10. Berilgan sonlarga teskari sonni toping.

Javob: a) $\frac{5}{7}\neq\frac{7}{5}$; b) $\frac{25}{9}$; c) $\frac{3}{17}$; d) $\frac{3}{17}$; e) $\frac{10}{37}$. f) $\frac{10}{37}$.

Kasrlarni bo‘lish

Barcha o‘quvchilar	Kasrlarni bo‘lishni bajara oladi.
Aksariyat o‘quvchilar	Kasrlarni bo‘lish amalini yecha oladi oladi va ularni masalalarda qo‘llay oladi.
Ba’zi o‘quvchilar	Kasrlarni bo‘lishga doir masalalarni tuza oladi.

➢ *Faollashtiruvchi savol va topshiriqlar*

1. Kasrlarni bo‘lish deganda nimani tushunasiz?
2. Butun sonni kasrga bo‘lganda butunning teskari soni olinadimi?
3. Kasrlarni bo‘lishga doir misollar ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda butun sonlarni oddiy kasrga bo‘lishda o‘zaro teskari sonlarga o‘tkazishda butun sonning ham teskarisini olish kerakmi deb o‘ylanadilar. Bu holatning oldini olish uchun avvalo butun kasr bo‘linuvchimi, bo‘luvchimi – o‘quvchi yaxshi tushunib olishi, keyin sonning teskarisini topishda maxrajni suratga, suratni maxrajga aylantirishga ko‘proq e’tibor qaratishi lozim.

➢ *Uyga vazifa*

14-,17-misollar (54–55-betlar)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Bo‘sh kataklarni to‘ldiring.

a) $5 \div 2 = \frac{5}{2} = 2\frac{1}{2}$ b) $8 \div 7 = \frac{8}{7} = 1\frac{1}{7}$ c) $19 \div 4 = \frac{19}{4} = 4\frac{3}{4}$

2. Bo‘lishni bajaring.

a) $14 \div 28$ b) $5 \div 18$ c) $21 \div 10$ d) $25 \div 9$

Javob: a) $14 \div 28 = \frac{14}{28} = \frac{1}{2}$ b) $2\frac{1}{10}$ c) $2\frac{1}{10}$ d) $2\frac{7}{9}$

3. Har bir stakanga necha litrdan suv quyish mumkin?



$3 \div 8 = \frac{3}{8}$ L



$1 \div 4 = \frac{1}{4}$ L

4. Bo‘sh kataklarni to‘ldiring.

a) $\frac{12}{25} \div 3 = \frac{\boxed{12} \div 3}{25} = \frac{\boxed{4}}{25}$

b) $\frac{15}{17} \div 3 = \frac{\boxed{15} \div \boxed{3}}{17} = \frac{\boxed{5}}{17}$

c) $\frac{21}{29} \div 7 = \frac{\boxed{21} \div \boxed{7}}{\boxed{29}} = \frac{\boxed{3}}{\boxed{29}}$

5. Bo‘lishni bajaring.

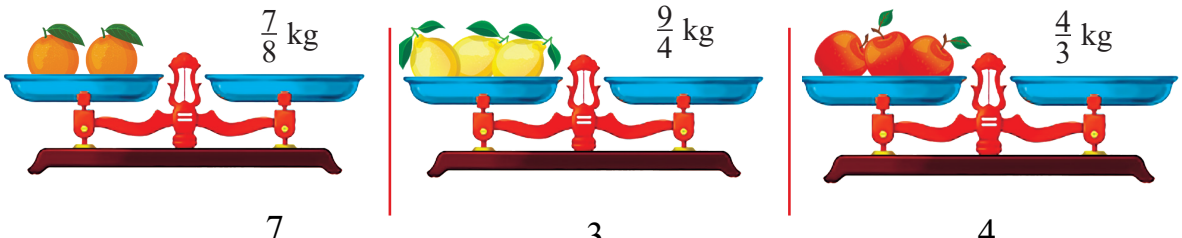
Javob: a) $\frac{3}{4} \div 3 = \frac{3 \div 3}{4} = \frac{1}{4}$ b) $\frac{2}{7}$ c) $\frac{1}{13}$ d) $\frac{5}{11}$

6. Hisoblang.

a) $1 \div \frac{1}{3}$ b) $1 \div \frac{1}{7}$ c) $\frac{7}{9} \div 1$ d) $\frac{3}{10} \div 1$

Javob: a) $1 \div \frac{1}{3} = 1 \times \frac{3}{1} = \frac{1 \times 3}{1} = 3$ b) 7 c) $\frac{3}{10}$ d) $\frac{3}{10}$

8. Bir dona mevaning og‘irligi qancha?



Yechish: $a + a = \frac{7}{8}$

$2a = \frac{7}{8}$

$a = \frac{7}{8} \div 2$

$a = \frac{7}{16}$

2) $\frac{3}{4}$

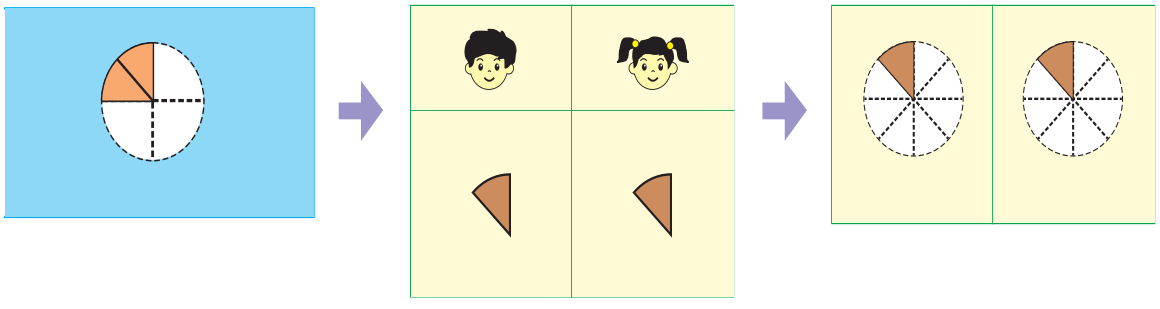
3) $\frac{4}{9}$

9. Hisoblang va natijalarni taqqoslang.

$6 \div \frac{3}{8}$	16	>	$6 \div \frac{8}{3}$	$2\frac{1}{4}$
$12 \div \frac{4}{5}$	15	>	$12 \div \frac{5}{4}$	$9\frac{3}{5}$
$5 \div \frac{7}{8}$	$5\frac{5}{7}$	>	$5 \div \frac{8}{7}$	$4\frac{3}{8}$

$7 \div \frac{3}{4}$	$9\frac{1}{3}$	>	$7 \div \frac{4}{3}$	$5\frac{1}{4}$

10. Rasm asosida masala tuzing va izohlang.



Masala: Jamshid va Yasmina birgalikda supermarketga mahsulot sotib olish uchun kirishdi. Rastada mahsulotning chorak qismi qolgan edi. Ular shu mahsulotni teng bo‘lishmoqchi. Har bir bola qanchadan mahsulot oladi?

Yechish: $\frac{1}{4} \div 2 = \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$. Demak, har bir bola mahsulotning $\frac{1}{8}$ qismini olgan.

11. Hisoblang.

a) $\frac{1}{2} \div \frac{3}{5}$ b) $\frac{33}{36} \div 55$ c) $\frac{7}{19} \div \frac{14}{19}$ d) $\frac{17}{24} \div \frac{51}{56}$

Yechish: a) $\frac{1}{2} \div \frac{3}{5} = \frac{1}{2} \times \frac{5}{3} = \frac{1 \times 5}{2 \times 3} = \frac{5}{6}$ b) $\frac{1}{2}$ c) $\frac{1}{2}$ d) $\frac{7}{9}$

12. Natijalarni toping. Qanday xulosaga keldingiz?

Bo‘lish	Ko‘paytirish
$\frac{3}{4} \div 4$	$\frac{3}{4} \times \frac{1}{4}$
$\frac{5}{8} \div 2$	$\frac{5}{8} \times \frac{1}{2}$
$\frac{2}{3} \div 4$	$\frac{2}{3} \times \frac{1}{4}$

Ko‘rsatma: ko‘paytirish va bo‘lishdan chiqqan natijalar teng chiqadi.

13. Hisoblang.

a) $\left(\frac{3}{4} \div \frac{1}{4}\right) \div \left(\frac{3}{10} \div \frac{1}{2}\right)$ b) $\left(\frac{2}{3} \div \frac{6}{12}\right) \div \left(\frac{3}{4} \div \frac{3}{6}\right)$ c) $\left(\frac{3}{7} \div \frac{4}{8}\right) \div \left(\frac{1}{7} \div \frac{2}{4}\right)$

Yechish: a)

1) $\frac{3}{4} \div \frac{1}{4} = \frac{3}{4} \times \frac{4}{1} = 3$ 2) $\frac{3}{10} \div \frac{1}{2} = \frac{3}{10} \times \frac{2}{1} = \frac{3}{5}$ 3) $3 \div \frac{3}{5} = \frac{3}{1} \times \frac{5}{3} = 5$

b)

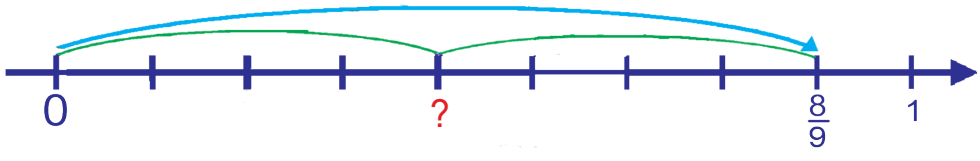
1) $\frac{2}{3} \div \frac{6}{12} = \frac{2}{3} \times \frac{12}{6} = \frac{4}{3}$ 2) $\frac{3}{4} \div \frac{3}{6} = \frac{3}{4} \times \frac{6}{3} = \frac{3}{2}$ 3) $\frac{4}{3} \div \frac{3}{2} = \frac{4}{3} \times \frac{2}{3} = \frac{8}{9}$

14. Bolalarga 12 ta pitsa teng taqsimlab berildi. Har bir bola $\frac{2}{3}$ bo‘lak pitsa oldi. Pitsa nechta bolaga taqsimlab berilgan?

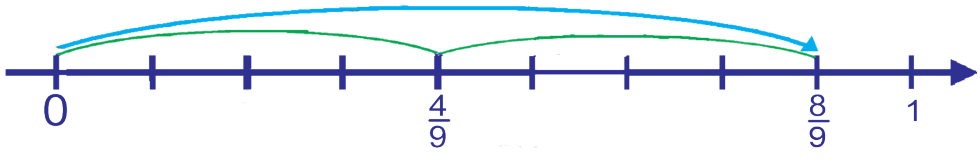
Yechish: $12 \div x = \frac{2}{3} \quad \Rightarrow x = 12 \div \frac{2}{3} = 12 \times \frac{3}{2} = 18$.

Javob: 12 ta pitsa 18 nafar bolaga teng taqsimlab berilgan.

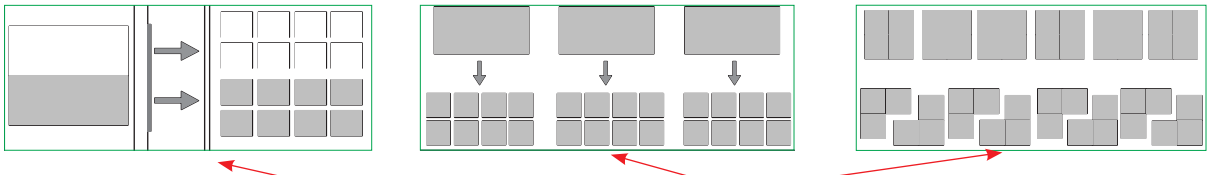
15. Chizma asosida ifoda tuzing va natijani toping.



Javob:



16. Berilgan rasmlarga mos bo‘lish amalini toping.



a) $6 \div \frac{3}{4} = 8$ b) $\frac{1}{2} \div \frac{1}{16} = 8$ c) $3 \div \frac{1}{8} = 24$

Qismga ko‘ra sonni topish

Barcha o‘quvchilar	Qismiga ko‘ra sonni topa oladi.
Aksariyat o‘quvchilar	Qismiga ko‘ra sonni topa oladi va ularni misollarda qo‘llay oladi.
Ba’zi o‘quvchilar	Qismiga ko‘ra sonni topishga doir masalalarni mantiqan tushunadi va yecha oladi.

➢ *Faollashtiruvchi savollar*

1. Qismiga ko‘ra sonni topish nima?
2. 46 ning yarmi nechaga teng?
3. 81 ning choragi-chi?
4. Yarmi 13 ga teng bo‘lgan son qaysi?
5. Choragi 25 ga teng bo‘lgan son qaysi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda qismiga ko‘ra sonni topishda mantiqiy fikrlashga qiynaladi. Masalalar yechishda bu jihatga ko‘proq e’tibor qaratish lozim.

➢ *Uyga vazifa*

60-misol (60-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Berilgan qismiga ko‘ra sonlarni toping.

a) yarmi 70 ga teng b) choragi 45 ga teng c) nimchoragi 50 ga teng

d) $\frac{1}{2}$ qismi 50 ga teng e) $\frac{1}{3}$ qismi 80 ga teng f) $\frac{1}{5}$ qismi 40 ga teng

Yechim va Javoblar:

a) $70 \div \frac{1}{2} = \frac{70}{1} \times \frac{2}{1} = 140$ b) 180 c) 400 d) 100 e) 240 f) 200

2. Savollarga javob bering.

a) Qaysi sonning $\frac{1}{5}$ qismi 10 ga teng? b) Qaysi sonning $\frac{1}{5}$ qismi 8 ga teng?

c) Qaysi sonning $\frac{1}{9}$ qismi 7 ga teng? c) Qaysi sonning $\frac{2}{9}$ qismi 8 ga teng?

Yechim va javoblar:

a) $10 \div \frac{1}{5} = \frac{10}{1} \times \frac{5}{1} = 50$ b) 40 c) 63 d) 36

3. Natijalarni taqqoslang.

a) Bir sonning $\frac{4}{5}$ qismi 184 ga teng. Ikkinchi sonning $\frac{12}{19}$ qismi 144 ga teng. Qaysi son katta?

b) Bir sonning $\frac{5}{6}$ qismi 240 ga teng. Ikkinchi sonning $\frac{20}{21}$ qismi 240 ga teng. Qaysi son katta? Qancha katta?

a) 1-son: $184 \div \frac{4}{5} = \frac{184}{1} \times \frac{5}{4} = \frac{46 \times 5}{1 \times 1} = 230$

Ikkinchi son: $144 \div \frac{12}{19} = \frac{144}{1} \times \frac{19}{12} = \frac{12 \times 19}{1 \times 1} = 228$ **Javob:** 230 > 228

b) $288 > 252$

4. To‘g‘ri to‘rtburchak shaklidagi bog‘ning 900 m^2 qismiga olma ko‘chati ekilgan. Olmalar bog‘ning $\frac{18}{35}$ qismiga ekilgan bo‘lsa, bog‘ necha m^2?

Yechish: $900 \div \frac{18}{35} = \frac{900}{1} \times \frac{35}{18} = \frac{50 \times 35}{1 \times 1} = 1750$ **Javob:** 1750 m^2

5. Alisher o‘zidagi pulning $\frac{5}{8}$ qismiga kitob sotib oldi. Agar kitobning narxi 15 000 so‘m bo‘lsa, Alisherning qancha puli bo‘lgan?

Yechish: $15000 \div \frac{5}{8} = \frac{15000}{1} \times \frac{8}{5} = \frac{3000 \times 8}{1 \times 1} = 24000$ **Javob:** 24 000 so‘m.

6. Noma’lum sonning $\frac{2}{3}$ qismi 10 ga teng. Shu sonni toping.

Yechish: $10 \div \frac{2}{3} = \frac{10}{1} \times \frac{3}{2} = \frac{30}{2} = 15$ **Javob:** 15.

7. Birinchi do‘konda 1800 kg un sotildi. Bu shu do‘konga keltirilgan unning $\frac{12}{19}$ qismiga teng. Ikkinchi do‘konda esa 1700 kg un sotildi. Bu shu do‘konga keltirilgan unning $\frac{34}{35}$ qismiga teng. Qaysi do‘konga ko‘p un keltirilgan?

Yechish: birinchi do‘konda: $1800 \div \frac{12}{19} = \frac{1800}{1} \times \frac{19}{12} = \frac{150 \times 19}{1 \times 1} = 2850$

Ikkinchi do‘konda: $1700 \div \frac{34}{35} = \frac{1700}{1} \times \frac{35}{34} = \frac{50 \times 35}{1 \times 1} = 1750$

Javob: Birinchi do‘konga ko‘proq un keltirilgan.

8. Bolalar daryo bo‘ylab sayohatga chiqishdi. Ular $4\frac{4}{5}$ km yurishganidan so‘ng hisoblab

ko‘rishsa, bosib o‘tilgan yo‘l jami yo‘lning $\frac{24}{35}$ qismini tashkil etar ekan. Ular daryo bo‘ylab necha kilometr yo‘l yurishni rejalashtirgan?

Yechish: $4\frac{4}{5} \div \frac{24}{35} = \frac{24}{5} \times \frac{35}{24} = 7$ **Javob:** 7 kg.

9. Qismiga ko‘ra sonlarni toping va natijalarni hisoblang.

a) $\frac{7}{18}$ qismi 49 ga teng songa $\frac{16}{21}$ qismi 64 ga teng sonni qo‘shing.

b) $\frac{2}{5}$ qismi 82 ga teng songa $\frac{3}{4}$ qismi 99 ga teng sonni qo‘shing.

c) $\frac{5}{7}$ qismi 105 ga teng sondan $\frac{4}{9}$ qismi 48 ga teng sonni ayiring.

d) $\frac{3}{5}$ qismi 150 ga teng sondan $\frac{7}{10}$ qismi 140 ga teng sonni ayiring.

Yechish: a) $49 \div \frac{7}{18} + 64 \div \frac{16}{21} = \frac{49}{1} \times \frac{18}{7} + \frac{64}{1} \times \frac{21}{16} = \frac{49}{7} + \frac{4 \times 21}{1 \times 1} = 7 + 84 = 91$

b) 337 c) 39 d) 50

10. Ahmad o‘zidagi pulning $\frac{5}{12}$ qismiga kitob, $\frac{7}{18}$ qismiga katta daftar, $\frac{5}{36}$ qismiga ruchka sotib oldi. Agar ruchka 5000 so‘m bo‘lsa, Ahmadning qancha puli bo‘lgan? Ahmadning qancha puli qolgan?

Yechish: dastlab ruchkaning narxi orqali Ahmadning jami pulini topib olamiz: $5000 \div \frac{5}{36} = \frac{5000}{1} \times \frac{36}{5} = \frac{1000 \times 36}{1 \times 1} = 36000$ so‘m. Demak, Ahmadning 36000 so‘m puli bo‘lgan. Bundan 15000 so‘mga kitob, 14000 so‘mga katta daftar sotib olgani kelib chiqadi. U 5000 + 15000 + 14000 = 34 000 so‘mga o‘quv qurollari sotib olgan bo‘lsa, Ahmadda 2000 so‘m pul qolgan.

Javob: 2000 so‘m.

11. Komil bobo nabiralariga bir nechta daftar olib keldi. Katta nabirasiga jami daftarlarning $\frac{5}{14}$ qismini, o‘rtanchasiga $\frac{3}{7}$ qismini, qolgan 9 ta daftarni esa kichik nabirasiga berdi. Komil bobo nechta daftar olib kelgan?

Yechish: katta va o‘rtancha nabirasiga $\frac{3}{7} + \frac{5}{14} = \frac{3 \times 2 + 5}{14} = \frac{11}{14}$ qism berilgan. Shunda kichik nabirasiga $1 - \frac{11}{14} = \frac{14 - 11}{14} = \frac{3}{14}$ qismi qolgan bo‘ladi. Qaysi sonning $\frac{3}{14}$ qismi 9 ga tengligini topamiz: $9 \div \frac{3}{14} = \frac{9}{1} \times \frac{14}{3} = \frac{3 \times 14}{1 \times 1} = 42$. Demak, Komil bobo 42 ta daftar olib kelgan.

Ko‘rsatma: o‘quvchilarga qo‘shimcha savol bering. Masalan, har bir nabiraga nechtadan daftar bergan?

Kasrlar ustida topshiriqlar

Barcha o‘quvchilar	Kasrlar ustida misollar yecha oladi.
Aksariyat o‘quvchilar	Kasrlar ustida misol va masalalar yecha oladi.
Ba’zi o‘quvchilar	Kasrlarga doir masalalarni, mantiqan tushunadi, yecha oladi va tuza oladi.

➢ *Faollashtiruvchi savollar*

1. Qismiga ko‘ra sonni topish nima?
2. 48 nafar o‘quvchining $\frac{1}{6}$ qismi qancha bo‘ladi?
3. Choragi 25 ga teng bo‘lgan son qaysi?

➢ *Mashqlar, ularning javoblari va yechimlari*

Kasrlarga doir masalalarni yechishda (qiyin mavzu bo‘lgani uchun) o‘qituvchi taqdimotlar, ko‘rgazmali qurollarga e’tibor qaratishi lozim.

➢ *Uyga vazifa*

33-, 35-misollar (65–bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Hisoblang.

a) $\frac{15}{10}+\frac{16}{20}-\frac{12}{8}$ b) $\frac{17}{21}+\frac{19}{42}-\frac{12}{63}$ c) $\frac{2}{3}+1\frac{1}{2}-\frac{1}{4}$

d) $1\frac{4}{5}-\frac{3}{4}+\frac{7}{10}$ e) $\left(\frac{3}{6}-\frac{1}{4}\right)+\left(\frac{1}{2}-\frac{1}{3}\right)$ f) $\left(1\frac{3}{5}-\frac{3}{10}\right)+\left(\frac{1}{4}-\frac{1}{8}\right)$

2. Ifodalarning qiymatini toping.

a) $\frac{3}{2}-\frac{1}{2}\div\frac{3}{5}+1\frac{1}{4}\times\frac{1}{3}$ b) $\left(\frac{5}{6}\div3\frac{1}{3}\right)\div\left(\frac{1}{2}+1\right)$

c) $\left(\frac{3}{2}+\frac{1}{2}\right)\times\frac{3}{4}+\left(\frac{1}{5}+\frac{2}{5}\right)\div\frac{4}{15}$ d) $\frac{5}{11}\div\frac{15}{22}\times1\frac{1}{2}$

e) $\left(3\frac{3}{4}\div6\frac{2}{3}\right)-\left(\frac{1}{3}\div1\frac{1}{3}\right)$ f) $\frac{7}{10}+\left(1\frac{1}{3}-\frac{2}{9}\right)\div1\frac{1}{9}+2\frac{1}{2}\times\left(\frac{1}{3}+\frac{1}{6}\right)$

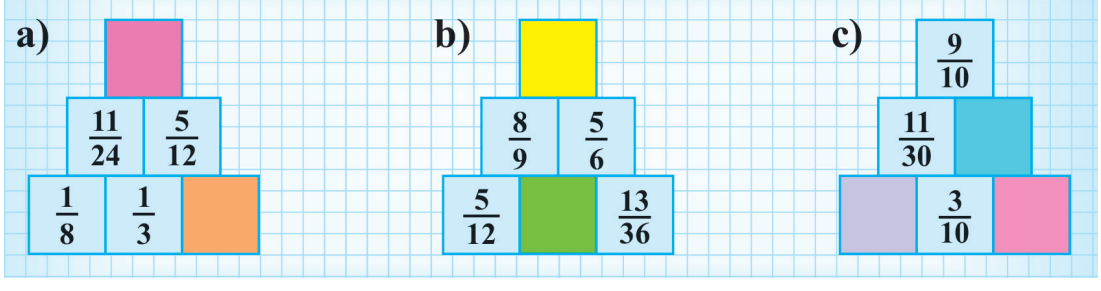
3. O‘quvchilar matematika fanidan yozma ish yozishdi. Ularning $\frac{1}{8}$ qismi a’lo, $\frac{1}{4}$ qismi

yaxshi, $\frac{1}{2}$ qismi qoniqarli va qolgan 4 o‘quvchi qoniqarsiz baho oldi. Nechta o‘quvchi yozma ish yozgan? Nechtadan o‘quvchi a’lo, yaxshi va qoniqarli baho olgan?

4. Sinfdagi 48 nafar o‘quvchining $\frac{1}{4}$ qismi matematika to‘garagiga, $\frac{3}{8}$ qismi ingliz tili to‘garagiga, $\frac{5}{16}$ qismi fizika to‘garagiga qatnaydi. Agar har bir o‘quvchi bittadan fan to‘garagiga kirishi ma’lum bo‘lsa, nechta o‘quvchi uchala fan to‘garagiga kirmaydi?

5. Madina $6\frac{2}{3}$ ni $5\frac{1}{4}$ ga ko‘paytirishni, Muslima esa $6\frac{2}{3}$ ni $3\frac{3}{4}$ ga ko‘paytirishni bajardi. Muxlisa dugonalarining natijalarini qo‘shdi. Muxlisa qanday sonni hosil qilgan?

6. Bo‘sh kataklarni to‘ldiring.



7. Ahmad $10\frac{3}{5}$ ni $9\frac{3}{17}$ ga ko‘paytirishni, Avaz esa $4\frac{3}{17}$ ni $10\frac{3}{5}$ ga ko‘paytirishni bajardi. Komil Ahmadning natijasidan Avazning natijasini ayirdi. Komilning natijasini toping.

8. Akmal $8\frac{7}{13}$ ni $6\frac{3}{5}$ ga ko‘paytirishni, Aziz esa $8\frac{7}{13}$ ni $6\frac{2}{5}$ ga ko‘paytirishni bajardi. Akbar do‘stlarining natijalarini qo‘shdi. Akbar qanday sonni hosil qilgan?

9. Hisoblang.

a) $45\times\left(2\frac{3}{5}+4\frac{11}{15}\right)$

b) $38\times\left(2\frac{3}{19}+2\frac{3}{38}\right)$

c) $105\times\left(5\frac{2}{3}-2\frac{5}{15}\right)$

d) $85\times\left(17\frac{5}{17}-6\frac{37}{85}\right)$

e) $\left(1-\frac{1}{10}\right)+\left(1-\frac{2}{5}\right)\div\frac{1}{5}$

f) $\frac{3}{4}\times\frac{4}{5}\times\frac{5}{6}\times\frac{6}{7}\times\frac{7}{8}\times\frac{8}{9}$

10. To‘g‘ri to‘rtburchakning bo‘yi $5\frac{5}{13}$ dm, eni esa undan $2\frac{7}{13}$ dm qisqa. To‘g‘ri to‘rtburchakning perimetrini toping.

11. Sayyoh $9\frac{1}{7}$ km yo‘l bosdi. Bu masofa butun yo‘lning $\frac{3}{7}$ qismini tashkil etadi. Sayyoh

yana necha kilometr masofani bosib o‘tishi kerak?

12. Taksoparkda 64 ta avtomobil bor. Dushanba kuni haydovchilarning $\frac{3}{4}$ qismi buyurtma qabul qildi. Nechta avtomobil buyurtma qabul qilgan?

13. Bir kunda $3\frac{1}{4}$ km uzunlikdagi yo‘l ta’mirlandi. Shunday ishlansa, 8 kunda qancha yo‘l ta’mirlanadi?

14. Ifodaning qiymatini toping.

a) $2\times\frac{1}{3}\div 6+\frac{2}{3}-\frac{5}{18}\div 2\frac{1}{2}$

b) $\left(85\frac{1}{3}-84\frac{1}{4}\right)\div\frac{1}{12}$

c) $\left(1+\frac{1}{2}\right)\times\left(1+\frac{1}{3}\right)\times\left(1+\frac{1}{4}\right)\times\left(1+\frac{1}{6}\right)\times\left(1+\frac{1}{7}\right)\times\left(1+\frac{1}{8}\right)\times\left(1+\frac{1}{9}\right)$

d) $2\div\left(1+\left(\frac{1}{2}+1\right)\div 1\frac{1}{3}\right)$

15. Sonning $\frac{4}{7}$ qismidan uning $\frac{1}{4}$ qismi ayrilgan edi, natija 18 ga teng bo‘ldi. Shu sonni toping.

16. Sonning qismini toping va amallarni bajaring.

1) 6300 ning $\frac{5}{9}$ qismiga $\frac{2}{3}$ qismi 400 ga teng bo‘lgan sonni qo‘shing.

2) 6000 ning $\frac{3}{4}$ qismidan $\frac{3}{5}$ qismi 900 ga teng bo‘lgan sonni ayiring.

17. Qismiga ko‘ra sonni toping va amallarni bajaring.

1) $\frac{5}{7}$ qismi 200 ga teng bo‘lgan sonni 360 ning $\frac{4}{15}$ qismiga teng songa ko‘paytiring.

2) $\frac{11}{16}$ qismi 484 ga teng bo‘lgan sonni 242 ning $\frac{4}{11}$ qismiga teng songa bo‘ling.

18. Ikkita chavandoz bir-biriga qarab ikki qishloqdan bir vaqtda yo‘lga chiqdi. Birinchi chavandoz $\frac{2}{3}$ soatda 12 km, ikkinchisi $\frac{3}{4}$ soatda 15 km yo‘l yurdi. Agar ular $2\frac{1}{2}$ soatdan keyin uchrashgan bo‘lsa, qishloqlar orasidagi masofani toping.

19. Misollarni ketma-ket, bir-biriga bog‘liq holda yeching.

1) $\frac{2}{3}\times\frac{3}{4}+\frac{1}{3}\times\frac{3}{4}=\bullet$

2) $\bullet\times 1\frac{2}{5}+1\frac{2}{5}\times 4\frac{1}{4}=\blacktriangle$

3) Sarvar 35 sonining $\frac{1}{\blacktriangle}$ qismini topdi va ■ natijaga erishdi. ■ sonini toping.

20. Sayyoh butun yo‘lning $\frac{7}{20}$ qismini o‘tgach, manzilgacha 52 km qolgani ma’lum bo‘ldi. Sayyoh necha kilometr yo‘l yurgan?

21. Sayyoh butun yo‘lning $\frac{5}{14}$ qismini yurdi. Hisoblasa, qolgan yo‘l bosib o‘tgan yo‘lidan 24 km ko‘p ekan. Sayyoh yana qancha yo‘l yurishi kerak?

22. 49 sonining $\frac{3}{7}$ qismi qaysi sonning $\frac{7}{11}$ qismiga teng?

23. 18 kg tuz $\frac{3}{4}$ kg dan qilib xaltachalarga solindi. Nechta xaltacha kerak bo‘lgan?

24. Do‘konga bir nechta qopda shakar keltirildi. Birinchi kuni $\frac{4}{9}$ qismi, ikkinchi kuni $\frac{2}{5}$ qismi sotildi. Shundan so‘ng do‘konda 14 qop shakar qoldi. Dastlab do‘konga necha qop shakar keltirilgan?

25*. Elbek o‘zidagi yong‘oqlarning $\frac{1}{3}$ qismini Alisherga, qolgan yong‘oqlarning $\frac{1}{3}$ qismini Dilyorga, qolgan yong‘oqlarning $\frac{1}{3}$ qismini Javlonga berdi. O‘zida esa 8 ta yong‘oq qoldi. Elbekda qancha yong‘oq bo‘lgan?

26*. Kitobning birinchi bo‘limi uning $\frac{5}{13}$ qismini, ikkinchi bo‘limi esa $\frac{2}{13}$ qismini tashkil etadi. Agar birinchi bo‘lim ikkinchi bo‘limdan 45 bet ko‘p bo‘lsa, kitob necha betdan iborat?

Summativ baholash. 2-nazorat ishi

1-variant

1. Kasrlarni ko‘paytiring: a) $\frac{15}{17}\times\frac{34}{23}\times\frac{23}{30}$; b) $2\frac{2}{13}\times3\frac{5}{7}\times1\frac{1}{2}$;

2. Muxlisaning 30000 so‘m puli bor edi. U pulining $\frac{7}{15}$ qismiga kitob sotib oldi. Muxlisaning qancha puli qolganini toping.

3. Bo‘lishni bajaring: $\left(3\frac{1}{15}\div\frac{23}{45}\right)\div2\frac{1}{2}$

4. Tenglamani yeching: $x\div1\frac{1}{8}+\frac{9}{24}=4\frac{3}{8}$

5. Amallarni bajaring: $\left(1\frac{1}{3}-\frac{7}{9}\right)\times\left(\frac{3}{5}+\frac{3}{25}\right)\div\frac{3}{4}\times7\frac{1}{2}$

2-variant

1. Kasrlarni ko‘payrtiring: a) $\frac{12}{13}\times\frac{6}{7}\times\frac{21}{24}$; b) $1\frac{7}{11}\times\frac{22}{25}\times5\frac{5}{9}$;

2. Malikaning 24000 so‘m puli bor edi. U pulining $\frac{5}{8}$ qismiga kitob sotib oldi. Malikaning qancha puli qolganini toping.

3. Bo‘lishni bajaring: $\left(1\frac{11}{13}\div1\frac{10}{26}\right)\div2\frac{2}{3}$

4. Tenglamani yeching: $x\div1\frac{1}{3}+4\frac{10}{14}=6\frac{5}{7}$

5. Amallarni bajaring: $\left(3-\frac{6}{7}\right)\times\left(\frac{2}{5}+\frac{1}{15}\right)\times7\frac{1}{2}\div\frac{3}{4}$

III BOB. O‘NLI KASRLARNI KO‘PAYTIRISH VA BO‘LISH

O‘nli kasrni natural songa ko‘paytirish

Barcha o‘quvchilar	3 × 8,9 va 3,12 × 6 kabi ko‘paytirishni hisoblay oladi.
Aksariyat o‘quvchilar	2,005 × 8 va 2 × 0,99 kabi misollarni yecha oladi.
Ba’zi o‘quvchilar	O‘nli kasrlarga doir masalalarni mantiqan tushunadi, yecha oladi va tuza oladi.

➢ *Faollashtiruvchi savollar*

1. O‘nli kasr qanday kasr?
2. O‘nli kasr bizga hayotda kerak bo‘ladimi? Fikringizni isbotlang.
3. Aralash son bilan o‘nli kasrning nima farqi bor?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda o‘nli kasrlarga doir masalalarni yechishda vergullarni qo‘yishda, ayniqsa, “nol butun” deb boshlanuvchi sonlarga vergul qo‘yishda qiynalishadi. Shuning uchun slaydlar, ko‘rgazmali qurollardan foydalanish, ko‘rgazmali vergullarni har xil rangda tayyorlab qo‘yish kerak.

➢ *Uyga vazifa*

16-17-misollar (69-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Hisoblang.

a) $\begin{array}{r} 30,5 \\ \times\ \ 3 \\ \hline \end{array}$ b) $\begin{array}{r} 8,8 \\ \times\ \ 7 \\ \hline \end{array}$ c) $\begin{array}{r} 15,14 \\ \times\ \ 15 \\ \hline \end{array}$ d) $\begin{array}{r} 17,25 \\ \times\ \ 11 \\ \hline \end{array}$

Javoblar: a) 91,5 b) 61,6 c) 227,1 d) 189,75

2. Ko‘paytmalarni toping.

a) 5 × 0,21 = 1,05 b) 8,1 × 4 = 32,4 c) 5,05 × 10 = 50,5

d) 12 × 8,8 = 105,6 e) 127 × 15,8 = 2006,6 f) 27,9 × 12 = 334,8

3. Bo‘sh kataklarni to‘ldiring.

a) $0,45\times 5=\frac{\square}{100}\times\square=\frac{\square\times\square}{100}=\frac{\square}{100}=\square,\square$

b) $1,4\times 6=\frac{\square}{\square}\times\square=\frac{\square\times\square}{\square}=\frac{\square}{\square}=\square,\square$

Yechish:

a) $0,45\times 5=\frac{45}{100}\times 5=\frac{45\times 5}{100}=\frac{225}{100}=2,25$ b) $1,4\times 6=\frac{14}{10}\times 6=\frac{14\times 6}{10}=\frac{84}{10}=8,4$

4. Hisoblang.

Yechish: a) $12,2\times 99=\frac{122}{10}\times 99=\frac{122\times 99}{10}=\frac{12078}{10}=1207,8$

b) $27,1\times 8=\frac{271}{10}\times 8=\frac{271\times 8}{10}=\frac{2168}{10}=216,8$

c) $12,5\times 82=\frac{125}{10}\times 82=\frac{125\times 82}{10}=\frac{10250}{10}=1025$

d) $99\times 0,99=99\times\frac{99}{100}=\frac{99\times 99}{100}=\frac{9801}{100}=98,01$

e) $77,7\times 33=\frac{777}{10}\times 33=\frac{777\times 33}{10}=\frac{25641}{10}=2564,1$

f) $41,1\times 2=\frac{411}{10}\times 2=\frac{822}{10}=82,2$

5. Stol tennisining to‘pi 2,73 g massaga ega. 8 ta stol tennisi to‘pining massasi qancha?

Yechish: $2,73\times 8=\frac{273}{100}\times 8=\frac{273\times 8}{100}=\frac{2184}{100}=21,84$. **Javob:** 21,84 gramm.

6. Futbol maydoni uchun 2 ta darvoza yasash kerak. Darvoza o‘lchamlari: uzunligi 7,32 m va bo‘yi 2,44 m. Ustaga jami necha metr truba kerak bo‘ladi?

Yechish: $2\times(7,32+2,44+2,44)=24,4$. **Javob:** 24,4 metr.

7. Hisoblang.

a) 2 × 0,99 = 1,98 b) 3 × 8,9 = 26,7 c) 5 × 0,82 = 4,1

d) 9 × 0,91 = 8,19 e) 7 × 0,33 = 2,31 f) 5 × 0,2 = 1

Yechish: a) $2\times 0,99=2\times\frac{99}{100}=\frac{2\times 99}{100}=\frac{198}{100}=1,98$

8. Natijalarga vergulni to‘g‘ri qo‘yamiz.

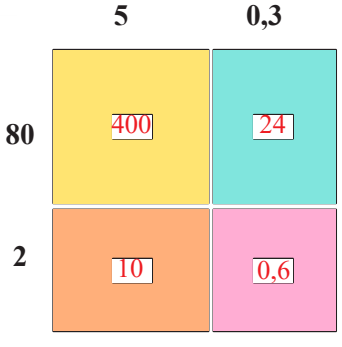
a) 35,5 b) 18,72 c) 46,398 d) 7,040 e) 16,04 f) 33

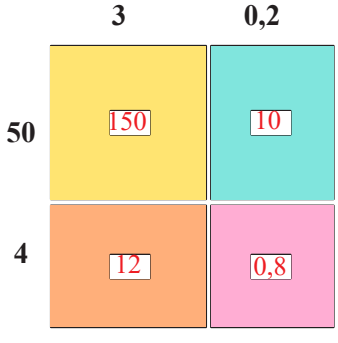
9. 5 ta yashil qutida 1,26 kg, 6 ta qizil qutida esa 1,026 kg shakar bor. Qaysi qutida ko‘proq shakar bor?

$5 \times 1,26 = 6,3$ $6 \times 1,026 = 6,156$ $6,3 > 6,126$

10. Maydonlarning har birining yuzasini hisoblang. Qanday munosabat mavjud?

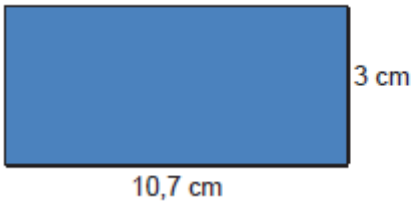
a) $82 \times 5,3 = 434,6 = 400 + 24 + 10 + 0,6$ b) $54 \times 3,2 = 172,8 = 150 + 10 + 12 + 0,8$

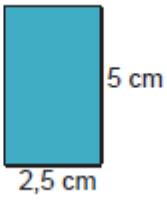


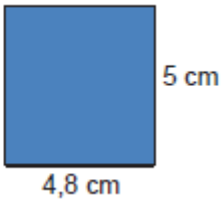


11. Berilgan to‘g‘ri to‘rtburchaklarning yuzini toping.

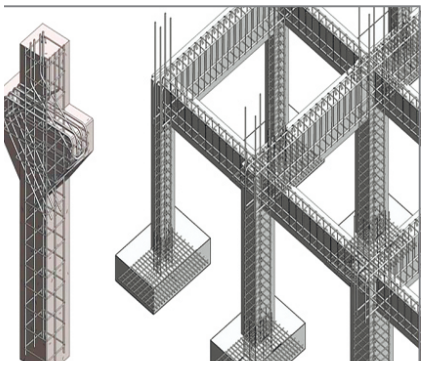
a) $S = 10,7 \times 3 = 32,1\ \text{cm}^2$ b) $S = 12,5\ \text{cm}^2$ c) $S = 24\ \text{cm}^2$







12. Bir dona ustun qurish uchun 7,84 qop sement va 14,3 metr temir kerak bo‘ladi. 12 ta beton ustun uchun qancha sement va temir kerak bo‘ladi?



Yechish: $12 \times 7,84 = 94,08$ qop sement
$12 \times 14,3 = 171,6$ metr temir

13. Bir dona beton ustunini 3,5 soat ichida qurish mumkin. Xuddi shunday 12 ta beton ustunni quruvchilar jamoasi necha soat ichida bitiradi?

Yechish: $12 \times 3,5 = 42$ soat

14. Bir dona beton ustun o‘lchamlari 0,5 × 0,5 × 4 metr bo‘lsa, 12 ta ustun hajmi qancha bo‘ladi? 1 m^3 beton ustunni qurish narxi 75 000 so‘m bo‘lsa, jami ustunlar uchun qancha pul sarflanadi?

Yechish: 12 ta ustun: 0,5 × 0,5 × 4 × 12 = 12 m^3

Sarflanadigan pul: 12 × 75 000 = 900 000 so‘m.

O‘nli kasrlarni 10 ga, 100 ga, 1000 ga ko‘paytirish

Barcha o‘quvchilar	O‘nli kasrlarni 10 ga, 100 ga, 1000 ga ko‘paytiradi.
Aksariyat o‘quvchilar	Istalgan o‘nli kasrlarni ko‘paytira oladi.
Ba’zi o‘quvchilar	O‘nli kasrlarga doir masalalarni yecha oladi va masalalar tuza oladi.

➢ *Faollashtiruvchi savollar*

1. O‘nli kasrlarni 10 ga ko‘paytirganda vergul o‘ngga suriladimi, chapgami?
2. O‘nli kasr bizga hayotda kerak bo‘ladimi? Javobingizni asoslang.
3. O‘nli kasrlarni 10 ga, 100 ga, 1000 ga ko‘paytirish osonmi, natural songami?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda o‘nli kasrlarga doir masalalarni yechishda vergullarni qo‘yishda, ayniqsa “nol butun” deb boshlanuvchi sonlarga vergul qo‘yishda qiynalishadi. Shuning uchun slaydlar, ko‘rgazmali qurollardan foydalanish, ko‘rgazmali vergullarni har xil rangda tayyorlab qo‘yish kerak.

➢ *Uyga vazifa*

10-11-misol (71-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Jadvalni to‘ldiring.

×	0,5	2,12	0,02	14,4	8,008	54,1	0,7	4,45	5,741
10	5	21,2	0,2	144	80,08	541	7	44,5	57,41
100	50	212	2	1440	800,8	5410	70	445	574,1
1000	500	2120	20	14400	8008	54100	700	4450	5741

2. Yetishmayotgan sonlarni toping.

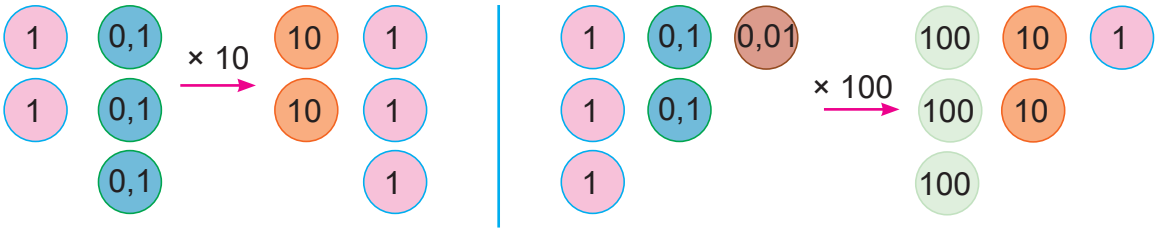
a) $1000 \times$ _____ $= 26280$ b) ____ $\times 90{,}3 = 903$ c) $10 \times$ ___ $= 395$

d) ___ $\times 90{,}6 = 906$ e) $81{,}26 \times$ ___ $= 81260$ f) ___ $\times 77{,}6 = 77600$

Javoblar: a) $1000 \times 26{,}280 = 26280$

b) 10 c) 39,5 d) 10 e) 1000 f) 1000

3. Modellar asosida hisoblang.



$2,3 \times 10 = 23$ $3,21 \times 100 = 321$

4. Fermer xo‘jaligidagi 5,6 ha yer maydoniga bodring ko‘chati ekilgan. Pomidor ko‘chatlari uchun 4,35 ha ajratilgan va qolgan maydon bo‘sh. Fermer jami 12,56 ha yerga egalik qilsa, ekilmagan yer maydoni qancha?

$12,56 - 5,6 - 4,35 = 2,61$

5. Sonlarni avval 10 ga ko‘paytiring, keyin esa o‘sib borish tartibida yozing.

a) 4,56 ; 4,39; 8,79; 3,3 b) 4,14; 0,27; 97,2; 99,6

c) 5,54; 46,5; 9,23; 4,16 d) 97,1; 67,5; 2,13; 6,21

Yechish: a) $4,56 \times 10 = 45,6$ $4,39 \times 10 = 43,9$ $8,79 \times 10 = 87,9$ $3,3 \times 10 = 33$

O‘sib borish tartibi: 33; 43,9; 45,6; 87,9.

Javob: b) 2,7; 41,4; 972; 996. c) 41,6; 55,4; 92,3; 465. d) 21,3; 62,1; 675; 971.

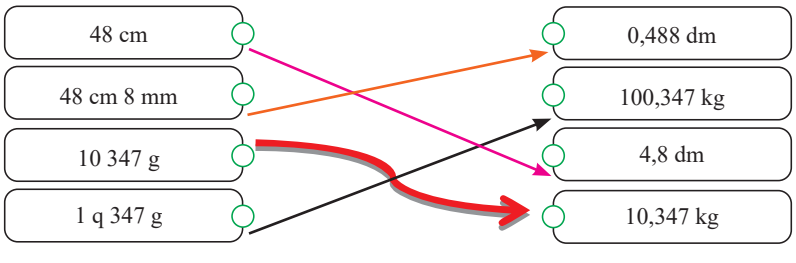
8. Hisoblang.

a) $2,597 \times 10 = 25,97$ $2,597 \times 100 = 259,7$ $2,597 \times 1000 = 2597$

b) $0,345 \times 10 = 3,45$ $0,345 \times 100 = 34,5$ $0,345 \times 1000 = 345$

c) $2,63 \times 10 = 26,3$ $2,63 \times 100 = 263$ $2,63 \times 1000 = 2630$

9. Moslarini belgilang.



10. Hisoblang.

a) $2,5 \times 10$ b) $33,7 \times 10$ c) $10 \times 0,10$ d) $10 \times 1,5$

e) $0,07 \times 100$ f) $20,3 \times 100$ g) $0,01 \times 100$ h) $21,02 \times 100$

Javoblar: a) 25 b) 337 c) 1 d) 15 e) 7 f) 2030 g) 1 h) 2102

11. Bo‘sh kataklarni to‘ldiring.

0,5	×	10	=	5
×		×		×
100	×	5,5	=	550
=		=		=
50	×	55	=	2750

10	×	1,7	=	17
×		×		×
2,7	×	10	=	27
=		=		=
27	×	17	=	459

O‘nli kasrlarni ko‘paytirish

Barcha o‘quvchilar	O‘nli kasrlarni ko‘paytirishni bajara oladi.
Aksariyat o‘quvchilar	Istalgan o‘nli kasrga istalgan o‘nli kasrni ko‘paytira oladi.
Ba’zi o‘quvchilar	0,08 × 0,05; 0,009 × 0,78 ko‘rinishidagi misol va masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. O‘nli kasr bilan oddiy kasrning farqi nimada?
2. $\frac{1}{7}$ ni o‘nli kasr ko‘rinishida yozish mumkinmi? Qanday?
3. O‘nli kasrlar ustida amallar osonmi, oddiy kasrlar ustidami?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda o‘nli kasrlarni ko‘paytirib, unga teng kasr hosil qilishda vergullarni qo‘yish chog‘i adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uyga vazifa*

20-, 21-22-misollar (74-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Hisoblang.

a) 6,3 × 2,5 = 15,75 b) 9,7 × 4,8 = 46,56 c) 5,96 × 2,5 = 14,9

d) 3,6 × 8,3 = 29,88 e) 32,8 × 7,3 = 239,44 f) 42,9 × 5,6 = 240,24

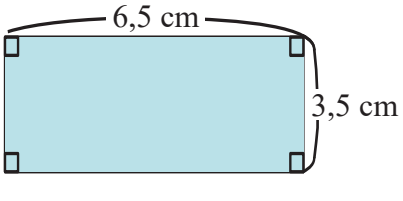
g) 87,3 × 5,3 = 462,69 h) 18,72 × 9,6 = 179,712

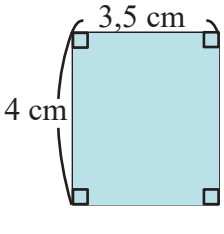
2. Hisoblang.

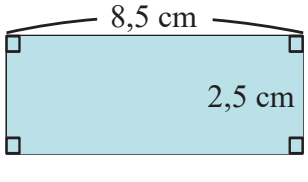
$$\begin{array}{r} 3{,}50 \\ \times\ \ 2{,}5 \\ \hline 8{,}75 \end{array} \qquad \begin{array}{r} 2{,}6 \\ \times\ \ 1{,}2 \\ \hline 3{,}12 \end{array} \qquad \begin{array}{r} 3{,}4 \\ \times\ \ 2{,}4 \\ \hline 8{,}16 \end{array} \qquad \begin{array}{r} 7{,}5 \\ \times\ \ 2{,}3 \\ \hline 17{,}25 \end{array}$$

3. Shakllarning yuzi va perimetrini toping.

a) $S = 6{,}5 \times 3{,}5 = 22{,}75$ $P = 2 \times (6{,}5 + 3{,}5) = 20$ b) $S = 14$; $P = 15$ c) $S = 21{,}25$; $P = 22$.







4. Mevalarning umumiy massasi qancha?

Jami			
? kg	10,5 kg	 dan 2,5 marta ko‘p	 dan 2 marta ko‘p

Olma: $10,5 \times 2,5 = 26,25$ kg. Limon: $26,25 \times 2 = 52,5$ kg. Jami: 10,5+26,25+52,5=89,25kg.

5. Namuna asosida ko‘paytirishlarni bajaring.

$$0,4 \times 0,09 = \frac{4}{10} \times \frac{9}{100} = \frac{4 \times 9}{10 \times 100} = \frac{36}{1000} = 0,036$$

a) 0,08 × 0,05 b) 0,006 × 0,31 c) 0,007 × 0,5

d) 0,009 × 0,78 e) 0,05 × 0,5 f) 0,700 × 0, 05

Javoblar: a) $0,08 \times 0,05 = \frac{8}{100} \times \frac{5}{100} = \frac{40}{10000} = 0,004$

b) 0,00186 c) 0,0035 d) 0,00702 e) 0,025 f) 0,035

6. Mutaxassislarning hisob-kitobiga ko‘ra, dunyo aholisi soni yildan yilga ko‘payib, 2100-yilda 11,2 mlrd ga yetadi.

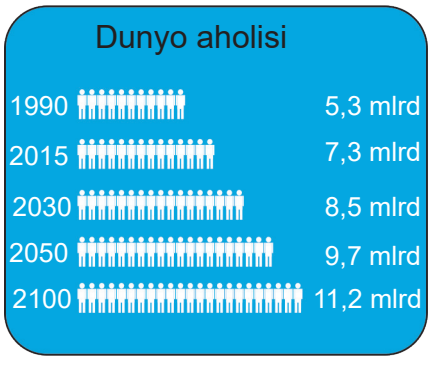
1. Qaysi yillar oralig‘ida aholi soni eng yuqori darajada ko‘payadi?

2. 1990-yildan 2100-yilgacha aholi soni qanchaga ko‘payadi?

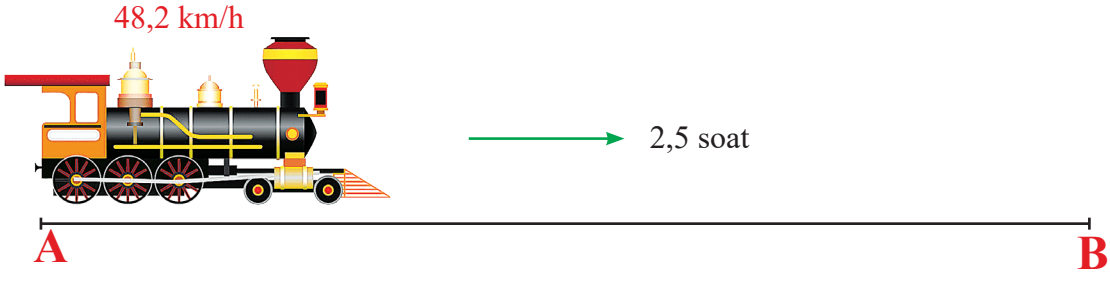
3. Rasm asosida ustunli diagramma tuzing.

Javob: 1) 1990-2015-yillar oralig‘ida.

2) 11,2 – 5,3 = 5,9 mlrd



7. A va B shaharlar orasidagi masofa qancha?



Yechish: poyezd A shahardan B shaharga 48,2 km/h o‘rtacha tezlik bilan 2,5 soatda yetib borgan bo‘lsa, shaharlar orasidagi masofa $2,5 \times 48,2 = 120,5$ km.

8. Ko‘paytirishlarni bajaring.

a) 0,03 × 0,03 = 0,0009 b) 0,8 × 0,8 = 0,64 c) 0,03 × 0,8 = 0,024

d) 0,08 × 0,4 = 0,032 e) 0,5 × 0,01 = 0,005 f) 0,08 × 0,3 = 0,024

Yechish: a) $0,03\times0,03=\frac{3}{100}\times\frac{3}{100}=\frac{9}{10000}=0,0009$

9. Ifodani ko‘paytma shaklida tasvirlang va natijani toping.

a) $3,6k + 1,4k$; $k = 4$ b) $15,8y + 9,2y$; $y = 8$

c) $24,52x - 15,42x$; $x = 1,2$ d) $5,8a - 0,8a$; $a = 0,8$

Yechish: a) $3,6k+1,4k=3,6\times4+1,4\times4=4\times(3,6+1,4)=4\times5=20$

b) 200 c) 48 d) 5,12

10. Meva sotuvchisi 23,5 kg mango, 67,25 kg tarvuz, 12,75 kg qulupnay va 56,25 kg apelsin sotdi. Dastlab mevalari 185,75 kg bo‘lgan bo‘lsa, sotuvchida qancha meva qoldi?

Yechish: 185,75 – 23,5 – 67,25 – 12,75 – 56,25 = 26.

11. Qulay usulda hisoblang.

a) 3,4 × 1,6 + 2,3 × 1,6 + 4,3 × 0,7 + 4,3 × 0,9 = 16

b) 5,6 × 3,8 + 5,6 × 1,6 + 2,7 × 4,6 + 2,9 × 4,6 = 56

c) 0,7 × 2,3 − 0,7 × 1,5 + 0,8 × 1,2 − 0,8 × 0,5 = 1,12

d) 6,5 × 2,5 − 1,6 × 6,5 + 0,9 × 0,7 + 0,8 × 0,9 = 7,2

Yechish: a) $3,4\times1,6+2,3\times1,6+4,3\times0,7+4,3\times0,9=1,6\times(3,4+2,3)+4,3\times(0,7+0,9)=$

$=1,6\times5,7+4,3\times1,6=1,6\times(5,7+4,3)=1,6\times10=16$

19. Ko‘paytirishni bajarib, jadvalni to‘ldiring.

a) 0,6 × 10 b) 15,978 × 10 c) 8,585 × 100 d) 48,045 × 10

Yuzlik	O‘nlik	Birlik	,	O‘ndan bir	Yuzdan bir	Mingdan bir
		6	,			
1	5	9	,	7	8	
8	5	8	,	5		
4	8	0	,	4	5	

20. Hisoblang.

a) 7,73 × 0,45 = 3,4785 b) 109,7 × 18,7 = 2051,39

c) 1,007 × 22,33 = 22,48631 d) 307,01 × 5,1 = 1565,751

e) 55,66 × 8,7 = 484,242 f) 42,7 × 7,06 = 301,462

g) 807,7 × 5,17 = 4175,809 h) 18,72 × 10,07 = 188,5104

Yechish: a) $7,73\times0,45=\frac{773}{100}\times\frac{45}{100}=\frac{773\times45}{10000}=\frac{34785}{10000}=3,4785$

O‘nli kasrni natural songa bo‘lish

Barcha o‘quvchilar	O‘nli kasrni natural songa bo‘lishni bajara oladi.
Aksariyat o‘quvchilar	Istalgan o‘nli kasrni istalgan butun songa bo‘lishni bajara oladi.
Ba’zi o‘quvchilar	6,30 ÷ 7, 0,007 ÷ 14 ko‘rinishidagi misol va masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. O‘nli kasrni natural songa bo‘lish va ko‘paytirishda vergullarni qo‘yishdagi farq qanday?
2. O‘nli kasrni natural songa bo‘lishga misol keltirish mumkinmi? Nima uchun?
3. O‘nli kasrni natural songa bo‘lish amali ustida misollar yechish osonmi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda o‘nli kasrlarni bo‘lishda vergul qo‘yish chog‘i adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uyga vazifa*

15-16-misollar (76-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Hisoblang.

a) 7,6 ÷ 2 =3,8 b) 4,8 ÷ 4 = 1,2 c) 14,49 ÷ 7 = 2,07

d) 12,8 ÷ 4 = 3,2 e) 6,3 ÷ 3 = 2,1 f) 3,9 ÷ 3 = 1,3

g) 17,7 ÷ 3 = 5,9 h) 111,6 ÷ 9 = 12,4.

Yechish: a) $\frac{76}{10}\times\frac{1}{2}=\frac{19}{5}=3,8$

2. Baykal ko‘li chuqurligi 1,61 km, Ladoga ko‘lining chuqurligi esa undan 7 marta kam. Ladoga ko‘lining chuqurligi qancha?

Yechish: $\frac{161}{100}\div 7=\frac{161}{100}\times\frac{1}{7}=\frac{23}{100}=0,23$ yoki 1,61 ÷ 7 = 0,23 km.

4. Arqonning uzunligi 11,6 cm. Uni 4 ta teng bo‘lakka bo‘lish mumkinmi?

Yechish: $\frac{116}{10}\div 4=\frac{116}{10}\times\frac{1}{4}=\frac{29}{10}=2,9$ yoki 11,6 ÷ 4 = 2,9 cm. **Javob:** mumkin.

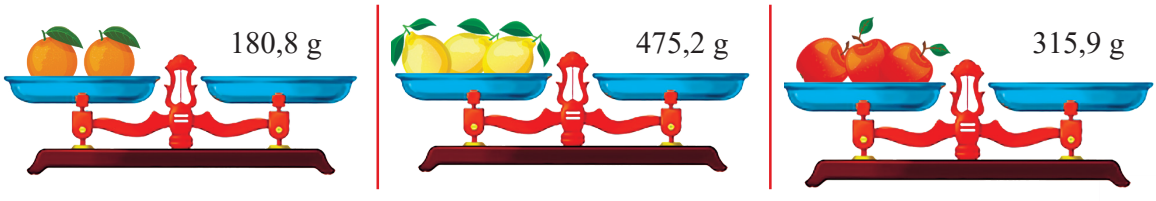
5. Hisoblang.

a) 1,4 ÷ 7 = 0,2 b) 0,30 ÷ 5 = 0,06 c) 0,66 ÷ 3 = 0,22 d) 2,5 ÷ 2 = 1,25

e) 8,9 ÷ 5 = 1,78 f) 1,8 ÷ 9 = 0,2 g) 0,45 ÷ 9 = 0,05 h) 0,21 ÷ 7 = 0,03

5. Bir dona mevaning og‘irligi qancha?

180,8 ÷ 2 = 90,4 475,2 ÷ 3 = 158,4 315,9 ÷ 3 = 105,3



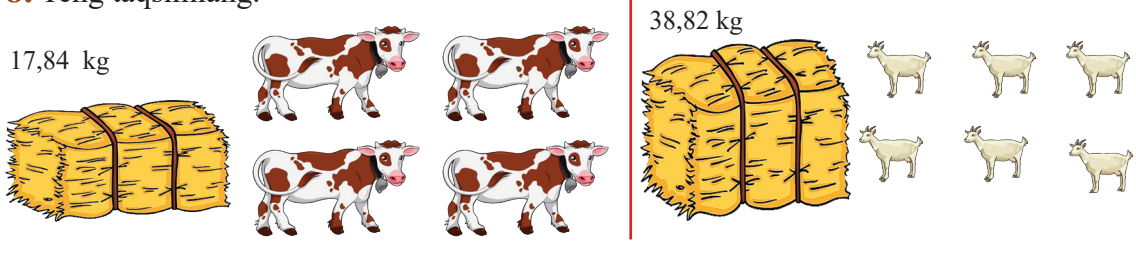
6. Jamilaning bo‘yi 1,64 m. Singlisining bo‘yi esa 2 marta past. Singlisining bo‘yini metrda ifodalang.

Yechish: $\frac{164}{100} \div 2 = \frac{164}{100} \times \frac{1}{2} = 0{,}82$ m. **Javob:** 0,82 m yoki 82 cm.

7. Orifjon 14,4 mln so‘mlik mototsiklni 12 oyga teng bo‘lib to‘lash sharti bilan sotib oldi. Orifjon har oy qancha pul to‘laydi?

Ko‘rsatma: *14,4 mln so‘mni 14 400 000 so‘m deb olish shart emas.* 14,4 ÷ 12 = 1,2 mln.

8. Teng taqsimlang.



17,87 ÷ 4 = 4,46 kg 38,82 ÷ 6 = 6,47 kg

9. Hisoblang.

a) 10,5 ÷ 5 = 2,1 b) 0,002 ÷ 2 = 0,001 c) 10,4 ÷ 13 = 0,8

d) 34,2 ÷ 100 = 0,342 e) 549 ÷ 600 = 0,915 f) 9 ÷ 1000 = 0,009

10. Hisoblang.

a) 0,8 ÷ 200 = 0,004 b) 1,6 ÷ 400 = 0,004 c) 4,8 ÷ 600 = 0,008

d) 12 ÷ 6000 = 0,002 e) 65 ÷ 5000 = 0,013 f) 324 ÷ 1000 = 0,324

O‘nli kasrni 10 ga, 100 ga, 1000 ga bo‘lish

Barcha o‘quvchilar	O‘nli kasrni 10 ga, 100 ga, 1000 ga bo‘lishni bajara oladi.
Aksariyat o‘quvchilar	Istalgan o‘nli kasrni 10 ga, 100 ga, 1000 ga bo‘lish bilan birga mantiqiy shakllarni ham bajara oladi.
Ba’zi o‘quvchilar	O‘nli kasrni 10 ga, 100 ga, 1000 ga bo‘lish bilan birga ularga doir tenglamalar qatnashgan misollarni va masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. O‘nli kasrni 10 ga, 100 ga, 1000 ga bo‘lishda vergullarni qo‘yish ko‘paytirishdagidan qanday farqlanishini bildingizmi?

2. O‘nli kasrni 10 ga, 100 ga, 1000 ga bo‘lishga doir hayotdan misol keltirish mumkinmi? Nima uchun?

3. Misollar yechganda qayerda qiynaldingiz?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda o‘nli kasrni 10ga, 100 ga, 1000 ga bo‘lishda vergullarni qayerga qo‘yishni adashtiradi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uyga vazifa*

9-10-misollar (78-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Jadvalni to‘ldiring.

÷	0,5	2,2	0,2	144	8,8	54,1	0,7	4,45	574,1
10	0,05	0,22	0,02	14,4	0,88	5,41	0,07	0,445	57,41
100	0,005	0,022	0,002	1,44	0,088	0,541	0,007	0,0445	5,541
1000	0,0005	0,0022	0,0002	0,144	0,0088	0,0541	0,0007	0,00445	0,5541

2. Hisoblang va xulosa qiling.

a) $8 \div 10 = 0{,}8$ $0{,}8 \div 10 = 0{,}08$ $0{,}08 \div 10 = 0{,}008$ $0,\ 008 \div 10 = 0{,}0008$

b) $2 \div 100 = 0{,}02$ $0{,}2 \div 100 = 0{,}002$ $0{,}02 \div 100 = 0{,}0002$ $0,\ 002 \div 100 = 0{,}00002$

c) $60 \div 1000 = 0{,}06$ $0{,}60 \div 1000 = 0{,}0006$ $0{,}060 \div 1000 = 0{,}00006$

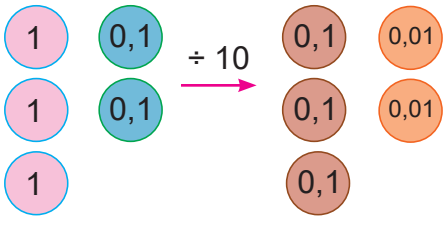
3. Hisoblang.

438,4 → ÷ 10 = 43,84; ÷ 100 = 4,384; ÷ 1000 = 0,4384

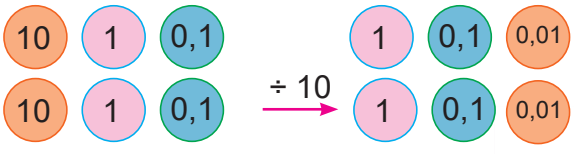
78,2 → ÷ 10 = 7,82; ÷ 100 = 0,782; ÷ 1000 = 0,0782

5,470 → ÷ 10; ÷ 100; ÷ 1000

6. Modellar asosida hisoblang.



3,2 ÷ 10 = 0,32



22,2 ÷ 10 = 2,22

7. Bo‘sh kataklarni to‘ldiring.

0,5	÷	10	=	0,05
÷		÷		÷
1000	÷	10	=	100
=		=		=
0,005	÷	1	=	0,005

25,5	÷	10	=	2,55
÷		÷		÷
10	÷	1	=	10
=		=		=
2,55	÷	10	=	0,255

8. Bo‘luvchilar nimaga teng? Bo‘linma-chi?

2,8 ÷ (10) = 0,28

2,8 ÷ (100) = 0,028

2,8 ÷ (1000) = 0,0028

4,08 ÷ (10) = 0,408

4,08 ÷ (1000) = 0,00408

4,08 ÷ 1000 = (0,00408)

9. Hisoblang.

a) 5,3 ÷ 1000 = 0,0053
b) 0,09 ÷ 1000 = 0,00009
c) 30,100 ÷ 10 = 3,01
d) 14,8 ÷ 10 = 1,48
e) 70,02 ÷ 100 = 0,7002
f) 60,1 ÷ 10 = 6,01
g) 14,74 ÷ 100 = 0,1474
h) 44,8 ÷ 100 = 0,448

10. $2010 \div 10 + 2010 \div 201 + 2010 \times 0$ ifodada bitta yoki ikkita qavsni shunday qo‘yingki, uning qiymati eng kichik bo‘lsin.

Yechish: $(2010 \div 10 + 2010 \div 201 + 2010) \times 0 = 0$

O‘nli kasrlarni bo‘lish

Barcha o‘quvchilar	Kasr qismi o‘ndan birgacha bo‘lgan o‘nli kasrlarni bo‘la oladi.
Aksariyat o‘quvchilar	Istalgan o‘nli kasrlarni bo‘la oladi.
Ba’zi o‘quvchilar	O‘nli kasrlarni bo‘lishning turli usullarini biladi va misollarda qo‘llaydi.

➢ *Faollashtiruvchi savollar*

1. O‘nli kasrni natural songa bo‘lish bilan ko‘paytirishda vergullarni qo‘yish farqini ayting.
2. O‘nli kasrni natural songa bo‘lishga misol keltirish mumkinmi? Nima uchun?
3. O‘nli kasrni natural songa bo‘lish amali ustida misollar yechish osonmi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda o‘nli kasrlarni bo‘lishda vergullarni qo‘yish chog‘i adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uy vazifa*

27-28, 31-misollar (82-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. O‘nli kasrlarni bo‘ling.

a) 2,6 ÷ 6,5 = 0,4 b) 27,56 ÷ 5,2 = 5,3 c) 43,2 ÷ 4,5 = 9,6 d) 45,6 ÷ 8 = 5,7

e) 17,05 ÷ 5,5 = 3,1 f) 41,34 ÷ 5,3 = 7,8 g) 25,84 ÷ 3,4 = 7,6 h) 15,39 ÷ 1,9 = 8,1

3. Ikki sonning ko‘paytmasi 42,63 ga teng. Agar birinchi son 2,1 bo‘lsa, ikkinchisini toping.

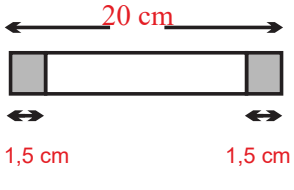
Yechish: $\frac{4263}{100} \div \frac{21}{10} = \frac{4263}{100} \times \frac{10}{21} = \frac{203}{10} = 20,3$ **Javob:** ikkinchi son 20,3

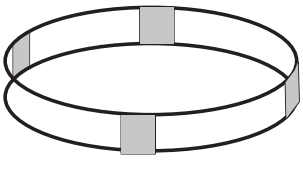
4. Sonlarni bo‘ling.

a) 17 ÷ 2 = 8,5 b) 17 ÷ 4 = 4,25 c) 17 ÷ 8 = 2,125 d) 17 ÷ 10 = 1,7

e) 170 ÷ 2 = 85 f) 170 ÷ 4 = 42,5 g) 170 ÷ 8 = 21,25 h) 170 ÷ 10 = 17

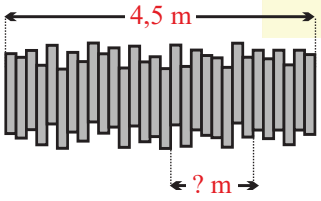
11. Qog‘ozning uzunligi 20 cm. Uning har bir uchida 1,5 cm qalinlikdagi yopishqoq qism mavjud. To‘rtta tasmali qog‘oz yopishtirildi hamda yopishqoq qismlar bir-birining ustiga to‘liq tushganda qog‘ozli halqa hosil bo‘ldi. Halqaning uzunligi qancha?





20 × 4 + 1,5×4 = 86 cm

12. 16-blokdan 24-blokkacha masofa qancha?



Har bir blok necha santimetr?

Yechish. Jami 30 ta blok bor.

Har bir blok $4,5 \div 30 = \frac{45}{10} \times \frac{1}{30} = \frac{15}{100} \times 100 = 15$ cm.

16-blokdan 24-blokkacha masofa (24 – 16) × 15 = 8 × 15 = 120 cm = 1,2 m

13. Javoblarni toping.

a) 10 sonini shunday ikki songa ajratingki, ularning ayirmasi 5 bo‘lsin. **Javob:** 7,5 va 2,5;

b) 23 sonidagi 2 bilan 3 soni orasiga qanday belgi qo‘yilsa, 2 dan katta, lekin 3 dan kichik son hosil bo‘ladi? **Javob:** 2,3;

c) 1 ta tugma 1,5 gramm chiqsa, 1 milliontasi necha tonna bo‘ladi? **Javob:** 1,5 tonna.

15. Bo‘sh ustunni to‘ldiring.

Oilalar	Oila a’zolari soni	1 oylik o‘rtacha daromad (mln so‘mda)	1 kishiga to‘g‘ri keladigan summa
Mahkamovlar oilasi	5	1,75	0,35 mln
Shomahmudovlar oilasi	3	1,25	tax. 0,41 mln

O‘quvchilar 0,35 mln so‘mni 350 000; taxminan 0,41 mln so‘mni 410 000 so‘m deb olishi mumkin.

16. Masalalarni yeching.

a) 5 ta ruchkaning narxi 14,50 ming so‘m. 1 ta ruchkaning narxi qancha?

b) Bir qutining og‘irligi 150,09 kg. 27 ta shunday qutining og‘irligi qancha bo‘ladi?

c) Idishda 13,5 L sharbat bor. Uni 3 ta bankaga teng qilib quyildi. Har bir bankada qancha sharbat bo‘ldi?

Javoblar: a) $14,5 \times 1000 = 14500 \div 5 = 2900$ b) 4052,43 c) 4,5

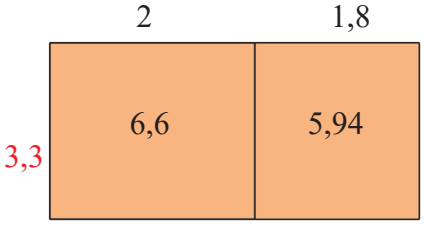
17. Sonlarning qaysi biri eng katta?

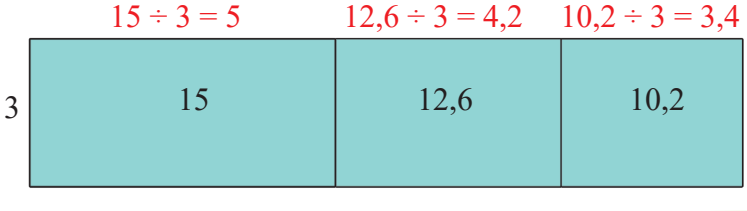
a) 10 × 0,001 × 100 = 1

b) 10000 × 100 + 10 = 1000010

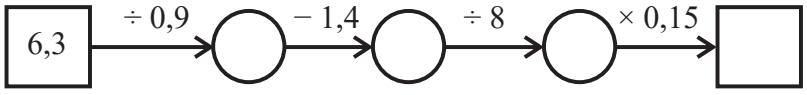
c) 0,1 × 0,01 × 10000 = 10

18. Noma’lum tomonlarni toping. Umumiy shakl tomoni va yuzasi qancha?



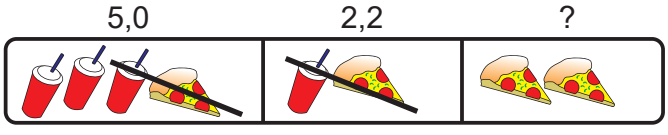


19. Hisoblang.



Yechish: $6,3 \div 0,9 = 7 - 1,4 = 5,6 \div 8 = 0,7 \times 0,15 = 0,105$

27. Noma'lumlarni toping.



Ko'rsatma: 1) 1 ta ichimlik va pitsa bo'lagi birgalikda 2,2 ga teng. 1-rasmdan 1 ta ichimlik va pitsa bo'lagi o'chirilsa, 2 ta ichimlik miqdori $5,0 - 2,2 = 2,8$ ga teng bo'ladi. Bundan 1 ta ichimlik miqdori $2,8 \div 2 = 1,4$ ga tengligi kelib chiqadi.

1 ta ichimlik va pitsa bo'lagi birgalikda 2,2 ga tengligidan 1 ta pitsa bo'lagi 2,2 dan 1,9 (1 ta ichimlik) ni ayiramiz: $2,2 - 1,4 = 0,8$. 2 ta pitsa miqdori $0,8 \times 2 = 1,6$ ga teng bo'ladi.

28. Ikki sonning ko'paytmasi 151,32 ga teng. Agar bittasi 7,8 bo'lsa, ikkinchisini toping.
Javob: $151,32 \div 7,8 = 19,4$.

29. Jamila 425,50 ming so'mga 9,25 metr mato sotib oldi. Bir metr matoning narxi qancha?
Javob: $425,50 \div 9,25 = 46$ ming so'm.

30. Bir kilogramm mahsulotning narxi 43,75 so'm. 17 kg mahsulot necha pul bo'ladi?
Javob: $43,75 \times 17 = 743,75$ so'm.

31. So'roq belgisi o'rniga qaysi amal belgisi qo'yilsa, tenglik to'g'ri bo'ladi?

a) $8,8 \times 10 = 88$ b) $44,55 \div 10 = 4,455$ c) $0,36 \times 100 = 36$

d) $7,5 \times 100 = 750$ e) $10,5 \div 10 = 1,05$ f) $3,78 \div 100 = 0,0378$

g) $3,3 \div 100 = 0,033$ h) $0,37 \times 10 = 3,7$ i) $5,18 \div 100 = 0,0518$

Kasrni o‘nli kasrga keltirish

Barcha o‘quvchilar	$\frac{16}{52}$ =16 ÷ 5 = 3,2 ko‘rinishidagi bo‘lishni bajara oladi.
Aksariyat o‘quvchilar	$8\frac{6}{52}$ ko‘rinishidagi misollarni ham o‘nli kasrga o‘tkaza oladi.
Ba’zi o‘quvchilar	Kasrlarni o‘nli kasrga keltirish bilan birga ularga doir tenglamalar qatnashgan misollarni va masalalarni hisoblay oladi.

➢ *Faollashtiruvchi savollar*

1. Kasrlarni o‘nli kasrga aylantirishda suratini maxrajga bo‘lganda cheksiz bo‘linadigan sonlar ham mavjudmi?
2. Kasrlarni o‘nli kasrga aylantirishda vergullarga ahamiyat beriladimi?
3. Siz misollar yechganda qayerda qiynaldingiz?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrlarni o‘nli kasrga aylantirishda vergullarni qo‘yish chog‘i adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

8-9-misollar (84-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Namunadan foydalanib jadvalni to‘ldiring.

a)	$\frac{13}{20}$	$\frac{65}{100}$	0,65
b)			0,3
c)			0,75
d)			0,2
e)			0,36

f)	0,75	$\frac{75}{100}$	$\frac{3}{4}$
g)	0,01		
h)	0,05		
i)	0,1		
j)	0,125		

Ko‘rsatma: 1-jadvalda o‘nli kasrga e’tibor bering. Bu – oddiy kasrni o‘nli kasrga keltirish jadvali. 2-jadvalda esa o‘nli kasrni oddiy kasr ko‘rinishida yozish kerak.

2. Kasrlarni o‘nli kasrga keltiring.

$\frac{7}{25}$ $\frac{17}{50}$ $\frac{107}{125}$ $\frac{3}{12}$ $\frac{3}{250}$ $\frac{1}{40}$

Javob: 1) $\frac{7}{25}\times\frac{4}{4}=\frac{28}{100}=0,28$ 2) 0,34 3) 0,856 4) 0,25 5) 0,012 6) 0,025

3. Bo‘linmani kasr ko‘rinishida yozing va o‘nli kasrga keltiring.

a) $5 \div 2 = \frac{25}{10} = 2{,}5$ b) $11 \div 2 = 5{,}5$ c) $9 \div 5 = 1{,}8$ d) $13 \div 4 = 3{,}25$

4. Bo‘sh kataklarni to‘ldiring.

a) $7 \div 2 = \frac{7}{2} = \frac{7 \times \boxed{5}}{2 \times \boxed{5}} = \frac{\boxed{35}}{\boxed{10}} = \boxed{3{,}5}$

b) $19 \div 20 = \frac{\boxed{19}}{\boxed{20}} = \frac{\boxed{19} \times \boxed{5}}{\boxed{20} \times \boxed{5}} = \frac{\boxed{95}}{\boxed{100}} = \boxed{0{,}95}$

5. O‘nli kasr ko‘rinishida yozing.

$\frac{14}{8}$ $\frac{15}{12}$ $\frac{33}{50}$ $\frac{27}{25}$ $\frac{19}{20}$ $\frac{11}{8}$

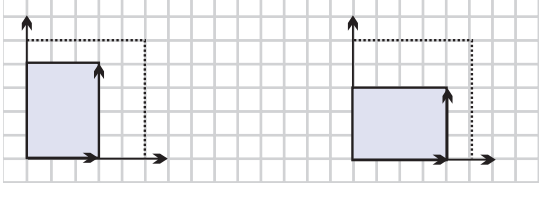
Yechish: 1) $\frac{7 \times 25}{4 \times 25} = \frac{175}{100} = 1{,}75$ 2) 1,25 3) 0,66 4) 1,08 5) 0,95 6) 1,375

6. Halima xola 2,5 kg shakar sotib oldi. U 1,3 kg pishiriq tayyorlash uchun 325 g shakar ishlatgan. U jami shakardan necha kg pishiriq tayyorlay oladi?

Yechish: 1) $\frac{25}{10} \div \frac{325}{1000} = \frac{5}{2} \times \frac{40}{13} = \frac{100}{13}$

2) $\frac{13}{10} \times \frac{100}{13} = 10$

7. Bo‘yalgan sohaning yuzini toping va taqqoslang.



Qanday xulosaga keldingiz?

(Rasmda 2 ta katak 1 santimetr)

Yechish: 1) $S = 1{,}5 \text{ cm} \times 2 \text{ cm} = 3 \text{ cm}^2$

2) $S = 2 \text{ cm} \times 1{,}5 \text{ cm} = 3 \text{ cm}^2$

Shakllarning yuzalari teng. Xulosa: ko‘paytuvchilarning o‘rni almashgani bilan ko‘paytma o‘zgarmaydi. Demak, ko‘paytirishning o‘rin almashtirish xossasi o‘nli kasrlar uchun ham o‘rinli.

8. Mos o‘nli kasrlarni toping.

Kasr	$\frac{3}{2}$	$\frac{99}{100}$	$\frac{2}{5}$	$\frac{9}{4}$	$\frac{49}{40}$	$\frac{3}{8}$	$\frac{3}{15}$	$\frac{18}{90}$
O‘nli kasr	1,5	0,99	0,4	2,25	1,225	0,375	0,2	0,2

Davriy o‘nli kasrlar

Barcha o‘quvchilar	1,45454545… davriy kasrlarni qisqa ko‘rinishda yoza oladi.
Aksariyat o‘quvchilar	1,45454545… va 0,0152152… davriy kasrlarni qisqa ko‘rinishda yoza oladi va ularni oddiy kasrga aylantiradi.
Ba’zi o‘quvchilar	Sof davriy o‘nli kasrga, aralash davriy o‘nli kasrga doir misol va masalalarni yecha oladi.

➢ *Faollashtiruvchi savollar*

1. Qanday o‘nli kasrlar davriy kasr deyiladi?
2. Davriy kasrlar nechta turga bo‘linadi?
3. Kasrlarni o‘nli kasrga aylantirishda vergullarga ahamiyat bering.
4. Sof davriy kasr bilan aralash davriy kasrning farqi nimada?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda kasrlarni o‘nli kasrga aylantirishda vergullarni va cheksizlik boshlangandan oldingi verguldan keyingi sonni qayerga qo‘yishda adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

9-10-misollar (86-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Davriy o‘nli kasrni qisqa ko‘rinishda yozing.

a) 0,6666666666666… = 0,(6) b) 0,33333333333333… = 0,(3)

c) 0,68181818181818… = 0,6(81)

2. Davriy o‘nli kasr ko‘rinishida ifodalang.

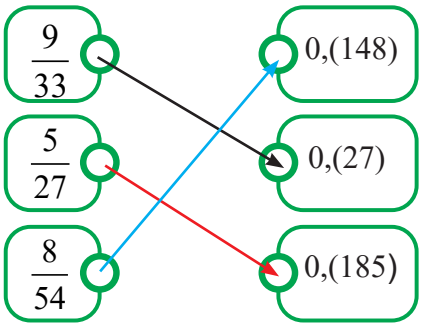
a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $\frac{4}{9}$ d) $\frac{7}{9}$ e) $\frac{1}{6}$ f) $\frac{5}{6}$

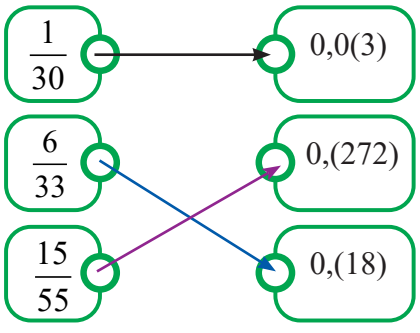
g) $\frac{3}{11}$ h) $\frac{8}{15}$ i) $\frac{5}{22}$ j) $\frac{1}{7}$ k) $\frac{1}{30}$ l) $\frac{6}{7}$

Javob: a) $\frac{1\times3}{3\times3}=\frac{3}{9}=0,(3)$ b) 0,(6) c) 0,(4) d) 0,(7) e) 0,1(6)

f) 0,8(3) g) 0,(27) h) 0,5(3) i) 0,2(27)

3. Oddiy kasrga mos davriy kasrlarni tutashtiring.





4. Davriy o‘nli kasrni qisqa ko‘rinishda yozing.

a) 1,555… = 1,(5)
b) 1,45454545… = 1,(45)
c) 1,24444… = 1,2(4)
d) 2,0717171… = 2,0(71)
e) 1,3599999… = 1,35(9)
f) 3,8123123… = 3,8(123)
g) 0,0152152…= 0,0(152)
h) 0,123333… = 0,12(3)

5. Davriy o‘nli kasrlarni cheksiz o‘nli kasr ko‘rinishida yozing.

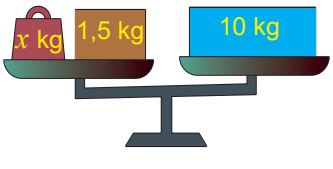
a) 0,(05) = 0,05555..
b) 1,(17) = 1,171717...
c) 0,(85) = 0,858585...
d) 2,(14) = 2,141414...
e) 1,4(3) = 1,43333...
f) 3,(001) = 3,001001001...
g) 0,41(01) = 0,41010101...
h) 0,12(3) = 0,123333...

6. Aralash sonlarni o‘nli kasr ko‘rinishida yozing.

$1\frac{4}{33}$ $1\frac{4}{9}$ $2\frac{2}{11}$ $2\frac{41}{333}$ $3\frac{82}{666}$

Javoblar: 1,(12) 1,(5) 2,(18) 2,(123) 3,(123)

7. Noma’lum massani toping.



$x + 1{,}5 = 10$
$x = 8{,}5$



$5{,}5 + x = 7{,}8$
$x = 2{,}3$



$17{,}8 + x = 45{,}14$
$x = 27{,}34$

8. Davriy o‘nli kasrni qisqa ko‘rinishda yozing.

a) 8,999… = 8,(9)
b) 4,767676… = 4,(76)
c) 2,14444… = 2,1(4)
d) 3,19171171… = 3,19(171)
e) 5,7544444… = 5,75(4)
f) 7,1123123… = 7,11(231)

O‘nli kasrni yaxlitlash

Barcha o‘quvchilar	56,8974 ≈ 56,9 ko‘rinishida o‘nli kasrlarni yaxlitlay oladi.
Aksariyat o‘quvchilar	(0,008 + 0,992) · (5 × 0,6 – 1,4) ko‘rinishida misollarning natijasini yaxlitlaydi.
Ba’zi o‘quvchilar	2,78__ ≈ 2,78 o‘nli kasrga doir misollarni va masalalarni hisoblay oladi.

➢ *Faollashtiruvchi savollar*

1. Qanday o‘nli kasrlar “davriy kasr” deyiladi?
2. Davriy kasrlar nechta turga bo‘linadi?
3. Yaxlitlash bilan davriy kasrni o‘nli kasrga aylantirishning farqi nimada?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar yaxlitlashda vergullarni va cheksizlik boshlangandan oldingi verguldan keyingi sonni qayerga qo‘yishda adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

9-10-misollar (88-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. O‘nli kasrni o‘ndan birlar xonasigacha yaxlitlang.

a) 87,52 = 87,5 b) 26,23 = 26,2 c) 95,01 = 95,0 d) 63,95 = 63,1
e) 96,873 = 96,9 f) 74,231 = 74,2 g) 745,96 = 746,0 h) 652,50 = 652,5

2. O‘nli kasrni birlar xonasigacha yaxlitlang.

a) 6,9 = 7 b) 3,7 = 4 c) 5,2 = 5 d) 4,5 = 5
e) 7,1 = 7 f) 6,4 = 6 g) 28,6 = 29 h) 14,9 = 15

3. Quyidagi sonlarni yuzdan birlar xonasigacha yaxlitlang.

a) 7,1417 = 7,14 b) 4,5885 = 4,59 c) 10,05175 = 10,05
d) 19,9186 = 19,92 e) 0,9975 = 1,00 f) 89,706 = 89,72

4. Quyidagi o‘nli kasrni yuzdan birlar xonasigacha yaxlitlang.

a) 2,999 = 3,00 b) 17,891 = 17,89 c) 9,786 = 9,79
d) 4,567 = 4,57 e) 99,999 = 100,00 f) 25,398 = 25,40

5. Supermarketda 10 kg uzum 24,799 ming so‘m turadi. Bu summa ikki do‘st o‘rtasida teng taqsimlanishi kerak. Shunda har biri qanchadan to‘laydi?

Yechish: $24,799 \approx 24,8 \div 2 = 12,4$ ming so‘m.

6. Natijalarni butun songacha yaxlitlang.

a) $(0,008 + 0,992) \times (5 \times 0,6 - 1,4) = 1,6 \approx 2$

b) $(0,93 + 0,07) \div (0,93 - 0,805) \approx 8$

c) $(50\,000 - 1397,3) \div (20,4 + 33,603) \approx 67$

d) $(2779,6 + 8027,4) \div (1,98 + 2,02) \approx 2702$

7. Yetishmayotgan raqamlarni toping.

a) 2,78 __ ≈ 2,78 b) 0,074 __ ≈ 0,075 c) 14,55 __ ≈ 15

d) 1,3 __ ≈ 1,4 e) 14,50 __ ≈ 14,50 f) 17,07 __ ≈ 17,08

g) 1,3456 __ ≈ 1,34 h) 10,001 __ ≈ 10,001 i) 76,544 __ ≈ 76,545

Javoblar: a) 1, 2, 3, 4 b) 5, 6, 7, 8, 9 c) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

d) 5, 6, 7, 8, 9 e) 0, 1, 2, 3, 4 f) 5, 6, 7, 8, 9

g) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 h) 0, 1, 2, 3, 4 i) 5, 6, 7, 8, 9

8. Berilgan sonni yaxlitlang.

a) 8,525 ni eng yaqin butun songacha. **Javob:** 9

b) 8,525 ni eng yaqin o‘ndan bir qismiga. **Javob:** 8,5

c) 8,525 ni yuzdan bir xonasigacha. **Javob:** 8,53

9. To‘g‘ri javobni tanlang.

a) 5,385 o‘ndan birlar xonasigacha yaxlitlanganda 5,3; 5,4; 5,5 ga teng.

b) 4,62 butun songa yaxlitlanganda 4,7; 4; 5 ga teng.

c) 6,652 o‘ndan birlar xonasigacha yaxlitlanganda 6,5; 6,6; 6,7 ga teng.

d) 4,106 yuzdan birlar xonasigacha yaxlitlanganda 4,10; 4,11; 4,12 ga teng.

10. Bolalarning bo‘yi va og‘irligini o‘ndan birlar xonasigacha, yoshini butun sonlarda yaxlitlang.

Ismi	Bo‘yi (m)	Og‘irligi (kg)	Yoshi
Adiba	1,076	34,57	11 yil-u 11 oy
Feruza	1,65	47,83	12 yil-u 8 oy
Ma’mura	1,43	39,55	13 yil-u 4 oy
Umida	0,97	27,07	9 yil-u 3 oy
Alimardon	1,07	32,65	10 yil-u 1 oy

Masalan: Adiba 1,076 ≈ 1,1 m; 34,57 ≈ 34,6 kg, 12 yosh.

O‘nli kasrlar ustida amallarga doir topshiriqlar

Barcha o‘quvchilar	$0{,}13p + 0{,}47p$; agar $p = 0{,}14$ ko‘rinishidagi o‘nli kasrlar ustida amallarni bajara oladi.
Aksariyat o‘quvchilar	$9x + 6x - 0{,}15 = 6{,}15$ ko‘rinishidagi tenglamalarni yecha oladi.
Ba’zi o‘quvchilar	O‘nli kasrga doir istalgan misol va masalalarni mantiqan tushunib, yecha oladi.

➢ *Faollashtiruvchi savollar*

1. O‘nli kasrlarga doir og‘zaki masala tuza olasizmi?
2. Kasrlarning nechta turini bilib oldingiz?
3. Tenglama bilan tenglikning farqi nimada?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar o‘nli kasrlar ustida amal bajarishda vergul qo‘yishda ko‘proq adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

18-, 20-misollar (91-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

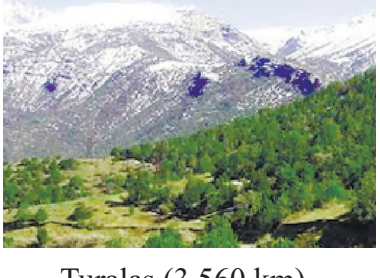
1. Surxondaryo viloyatidagi Hazrati Sulton, Markaziy Qizilqum (Navoiy viloyati)da joylashgan Muruntov, Jizzax viloyatida joylashgan Turalas tog‘lari O‘zbekistonning eng baland nuqtalaridan biridir. Tog‘larni tartib bilan joylashtiring. Qaysi tog‘ eng baland, qaysi biri eng past?



Hazrat Sulton (4,688 km)



Muruntov (0,816 km)

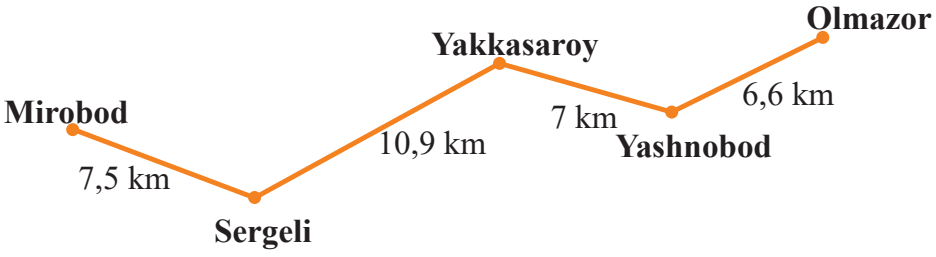


Turalas (3,560 km)

Yechish: Hazrat Sulton (4,688 km) – eng baland tog‘.

Muruntov (0,816 km) – eng kichik tog‘.

2. Mirobod va Olmazor tumanlari orasidagi masofani toping.



Yechish: $7,5+10,9+7+6,6=32$ km

3. Harfiy ifodalarning qiymatini toping.

a) $0,13p+0,47p=0,6p=0,14\times0,6=0,084$ b) $0,7b-0,4b=0,3b=0,3\times5,4=1,62$

c) 0,06 d) 2,9

4. Tenglamalarni yeching.

a) $9x+6x-0,15=6,15$

$15x=6,15+0,15$

$x=\frac{6,3}{15}=\frac{63}{150}=0,42$

b) 0,9 c) 3,4 d) 0,16 e) 0,14 f) 0,1

5. Poyezd 2,8 soatda 135,8 km masofani bosib o‘tdi. U shunday tezlikda 6,2 soat harakatlansa necha kilometr masofani bosib o‘tadi?

Yechish: $\frac{1358}{10}\div\frac{28}{10}=\frac{1358}{10}\times\frac{10}{28}=\frac{97}{2}$

$\frac{97}{2}\times\frac{62}{10}=300,7$

Javob: 300,7 km.

6. Qizlar 1,8 kg pechenyega 45,36 ming so‘m to‘lashdi. 4,5 kg shunday pechenye uchun qancha pul kerak?

Yechish:

$\frac{4536}{100}\div\frac{18}{10}=\frac{4536}{100}\times\frac{10}{18}=\frac{252}{10}$

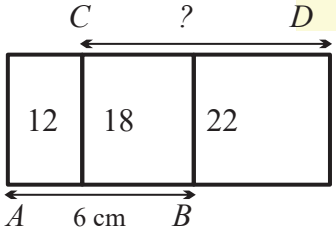
$\frac{252}{10}\times\frac{45}{10}=\frac{11340}{100}=113,4$ ming so‘m.

Javob: 113,4 ming so‘m.

7. Jahongir maktabga avtobusda borib, piyoda qaytib kelsa, jami 3 soat yo‘lda bo‘ladi. Agar maktabga avtobusda borib kelsa, 1 soat vaqt sarflaydi. U maktabga piyoda borib, piyoda uyiga qaytsa, qancha vaqt sarflaydi?

Javob: borib kelish yo‘li bir xilligini hisobga olsak, Jahongir maktabga avtobusda borishning o‘ziga yarim soat vaqt sarflaydi. Shunda 2,5 soat piyoda borishga sarflangan. Piyoda borib kelishga 5 soat vaqt ketadi.

10. CD masofa qancha?



Yechish: $12+18=30$
$30\div 6=5$
$22+18=40$
$40\div 5=8$

Javob: 8 cm.

11. Tenglamalarni yeching.

a) $(1{,}8+x)-21=71{,}4$ b) $16\,(4x-3{,}4)=6{,}08$ c) $(x-1{,}25)-4{,}5=27$

a) $(1{,}8+x)-21=71{,}4$
$1{,}8+x=71{,}4+21$
$x=92{,}4-1{,}8$
$x=90{,}6$

b) 0,945

c) 32,75

12. Ifodaning qiymatini toping.

a) $1{,}6a+1{,}6b$, agar $a+b=100$ bo‘lsa

a) $1{,}6a+1{,}6b=1{,}6(a+b)=1{,}6\times 100=160$

b) $2{,}5x-2{,}5y$, agar $x-y=4$ bo‘lsa

b) 10

13. Taqqoslang.

a) 1,36 kg > 589,6 g

b) 2396,4 kg > 2,278 kg

c) 28,4 mm = 2,84 cm

d) 92,6 cm > 9,24 dm

14. Oltinchi sinfda 100 nafar o‘quvchi bor. Shundan 75 nafari nemis tilini, 85 nafari fransuz tilini, 10 nafari esa bu tillarning hech birini bilmaydi. Nechtadan o‘quvchi faqat fransuz va faqat nemis tilini biladi?

Javob: faqat nemis tilini biladiganlar 5 nafar;
faqat fransuz tilini biladiganlar 15 nafar;
ham nemis, ham fransuz tilini biladiganlar 70 nafar;
tillarning hech birini milmaydiganlar 10 nafar.
Ushbu topshiriqni Eyler-Venn diagrammasidan foydalanib yechish ham mumkin.

15. Ali bilan Vali uylaridan chiqib, 0,2 soatdan so‘ng uchrashdi. Agar ularning uylari orasidagi masofa 1,236 km va Vali 51 m/min tezlik bilan yurishi ma’lum bo‘lsa, Alining tezligini toping.

$$51\times\frac{\frac{1}{1000}}{\frac{1}{60}}\frac{km}{soat}=3{,}06\frac{km}{soat}$$

$$1{,}236\div 0{,}2-3{,}06=3{,}12\frac{km}{soat}$$

16. Ikki velosipedchi bir nuqtani qarama-qarshi yo‘nalishda tark etdi. Biri 12,4 km/h tezlikda, ikkinchisi 13,2 km/h tezlikda ketayotgan edi. Ular orasidagi masofa qancha vaqtdan keyin 133,12 km bo‘ladi?

Yechish: $133{,}12\div(12{,}4+13{,}2)=5{,}2\,soat$

17. Piyoda va velosipedchi qishloqdan bir paytda yo‘lga chiqdi va bir yo‘nalishda piyoda 4,8 km/h, velosipedchi esa 12,4 km/h tezlikda harakatlandi. Qancha vaqtdan keyin ular orasidagi masofa 22,8 km ga teng bo‘ladi?

Yechish: $22,8 \div (12,4 - 4,8) = 3\,soat$

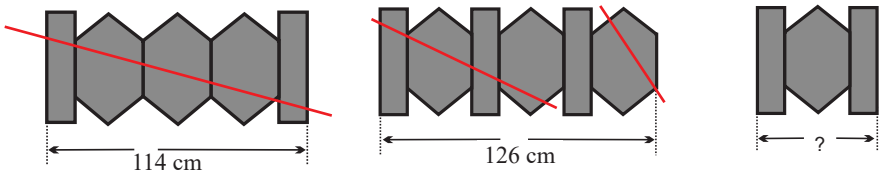
18. Hisoblang.

a) $84 \div 0,35 - 4,64 \div 5,8 - 60 \div 48 + 2,9 \div 0,58 = 240 - 0,8 - 1,25 + 5 = 242,95$

b) $40 - (2,0592 \div 0,072 - 19,63) = 40 - 28,6 + 19,63 = 31,03$

c) $7,67 \div 0,65 - (0,394 + 0,7688) \div 0,57 = 11,8 - 2,04 = 9,76$

19. Rasm asosida noma’lumni toping.



1-shakldagi 3 ta oltiburchak bilan 2-shakldagi 3 ta oltiburchakni, 1-shakldagi 2 ta to‘g‘ri to‘rtburchak bilan 2-shakldagi 2 ta to‘g‘ri to‘rtburchakni o‘chiring. 2-shaklda 1 ta to‘g‘ri to‘rtburchak qoladi va u quyidagiga teng bo‘ladi: 126 – 114 = 12 cm.

1-shakl bo‘yicha tenglama tuzamiz: $3x + (12+12) = 114$. Bu yerda x – oltiburchak o‘lchami. Tenglamadan $x =$ 30 cm ekani kelib chiqadi. Demak, noma’lum shakl 30 +12 + 12 = 54 cm ekan.

20. Tenglamani yeching.

a) $9x + 3,9 = 31,8$ b) $7x + 2,4 = 34,6$

c) $(y + 4,5) \div 7 = 1,2$ d) $(y - 1,8) \div 0,7 = 5,8$

a) $9x + 3,9 = 31,8$

$9x = 31,8 - 3,9$

$9x = 27,9$

$x = 3,1$

b) $x = 4,6$ c) $y = 3,9$ d) $y = 5,86$

LOYIHA ISHI

Eratosfen g‘alviri

Eratosfen g‘alviri (Eratosfen elagi) – n natural songacha bo‘lgan barcha tub sonlarni topish algoritmi bo‘lib, qadimiy grek matematigi Eratosfen Kireniy sharafiga nomlangan. Eratosfen elagi algoritmi kichik (odatda 10 milliondan kichik bo‘lgan) tub sonlarni topishning eng tez usuli hisoblanadi.

Avvalambor tub son nimaligini esimizga solib olaylik: faqat 1 ga va o‘ziga bo‘linadigan natural sonlar tub sonlar deyiladi.

Quyida $n = 30$ uchun Eratosfen g‘alvirini qo‘llab tub sonlarni toping.

1. Buning uchun 2 dan 30 gacha bo‘lgan barcha butun sonlarni tartib bo‘yicha yozib chiqamiz.

2. 2 dan 30 gacha bo‘lgan sonlardan $2^2 = 4$ dan boshlab 2 ga bo‘linadiganlarni (2 dan tashqari, chunki 2 tub son) o‘chirib chiqamiz.

3. Keyingi o‘chirilmagan son 3. Ro‘yxatdan $3^2 = 9$ dan boshlab 3 ga bo‘linadiganlarini (3 dan tashqari, chunki 3 tub son) o‘chirib chiqamiz.

4. Ro‘yxatdan endi $5^2 = 25$ dan boshlab 5 ga bo‘linadiganlarini (5 dan tashqari, chunki 5 tub son) o‘chirib chiqamiz.

5. Jarayonni shu yerda to‘xtatamiz. Chunki $7^2 > 30$.

	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Demak, bo‘yalmay qolgan sonlar: 2; 3; 5; 7; 11; 13; 17; 19; 23; 29.

Topshiriq.

1. 1000 gacha bo‘lgan sonlarni Eratosfen g‘alviridan o‘tkazing. Qaysi sonlar g‘alvirdan o‘tmaydi?

Tarixiy ma’lumot

Eratosfen (taxm. mil. av. 276, Kirena, hozirgi Liviya – mil. av. 194, Aleksandriya, Misr) – qadimgi yunon olimi. Iskandariya (Aleksandriya) va Afina shaharlarida tahsil olgan. Iskandariya kutubxonasining boshlig‘i bo‘lgan. Tub sonlarni topish usulini taklif etgan. Matematik geografiyaga asos solgan, jumladan, yer yuzining obod qismi (eykumena)ning xaritasini tuzgan. Birinchi bo‘lib Yer meridiani yoyi uzunligini hisoblagan. Fanga “geografiya”, “kenglik”, “uzunlik” tushunchalarini kiritgan. Eratosfen xronologiya, astronomiya, tilshunoslik, falsafa va musiqa bilan ham shug‘ullangan. Eratosfen asarlarining ayrim qismlarigina bizgacha yetib kelgan.

Summativ baholash. 3-nazorat ishi

1-variant

1. Qulay usulda amallarni bajaring: 0,4 × 0,7 + 0,4 × 1,3 + 0,5 × 2,8 + 0,5 ×0,8

2. To‘rtta dugona bir misolni birgalikda bajarishdi. Kamola 7,8 ni 8 ga bo‘lishni, Zarina 9,6 ni 6 ga bo‘lishni, Aziza esa 3,6 ni 9 ga bo‘lishni bajardi. Mahliyo Kamola va Zarina hosil qilgan natijalarni qo‘shib, yig‘indidan Aziza hosil qilgan natijani ayirdi. Mahliyo hosil qilgan natijani toping.

3. Hisoblang: 0,324 × 10 + 676 ÷ 100 – 92 ×0,1

4. O‘nli kasrlarni o‘ndan birlar xonasigacha yaxlitlang: 4596,2768; 6350,7379

5. Tenglamani yeching: $x \times 0{,}4 + 0{,}(6) = 3{,}8(6)$

2-variant

1. Qulay usulda amallarni bajaring: 3,2 × 0,8 – 0,2 × 0,8 + 1,3 × 1,4 + 1,6 × 1,3

2. To‘rtta o‘rtoq bir misolni birgalikda bajarishdi. Akmal 5,6 ni 7 ga bo‘lishni, Zokir 19,2 ni 2 ga bo‘lishni, Jamol esa 1,6 ni 4 ga bo‘lishni bajardi. Qobil Akmal va Zokir hosil qilgan natijalarni qo‘shib, yig‘indidan Jamol hosil qilgan natijani ayirdi. Qobil hosil qilgan natijani toping.

3. Hisoblang: 0,731 × 10 +26,9 ÷ 10 – 8200 ÷ 1000

4. O‘nli kasrlarni o‘ndan birlar xonasigacha yaxlitlang: 72, 0647; 11,2476

5. Tenglamani yeching: $x \div 0{,}6 + 0{,}(7) = 10{,}(77)$

IV BOB. BUTUN SONLAR

Musbat va manfiy sonlar. Butun sonlar haqida tushuncha

Barcha o‘quvchilar	Musbat va manfiy sonlar, butun sonlarni biladi, tartiblaydi.
Aksariyat o‘quvchilar	Musbat va manfiy sonlar, butun sonlarga doir misollarni bajara oladi.
Ba’zi o‘quvchilar	Musbat va manfiy sonlar, butun sonlarga doir misol va masalalar tuza oladi, mantiqan hisoblay oladi.

➢ *Faollashtiruvchi savollar*

1. Qanday sonlar “musbat sonlar” deyiladi? Musbat butun sonlar qanday bo‘ladi?
2. Qanday sonlar “manfiy sonlar” deyiladi? Manfiy butun sonlar qanday bo‘ladi?
3. Qanday sonlar musbat ham, manfiy ham emas?
4. Barcha natural sonlarni “butun sonlar” deyish mumkinmi? “Musbat natural sonlar” deyish-chi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar manfiy sonlar ustida amal bajarishda ko‘proq ishora qo‘yishda adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

Uyga vazifa: 10-,11-misollar (96-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

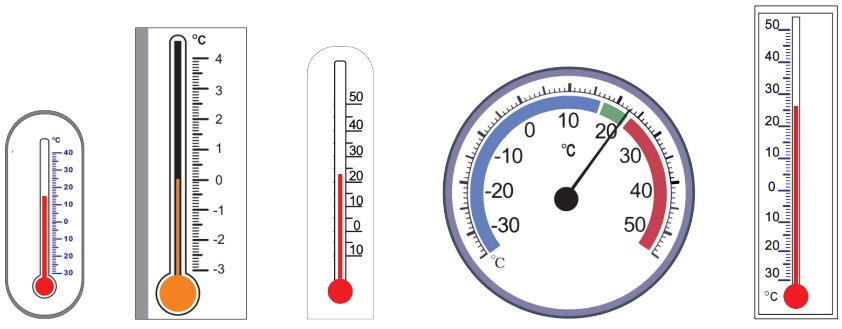
1. Berilgan sonlar bilan jadvalni to‘ldiring.

Butun sonlar	–15; –10; –9; –8; –7; –6; –4; –3; –2; –1; 0; 2; 8; 9; 11; 12; 14; 21
Musbat butun sonlar	2; 8; 9; 11; 12; 14; 21
Manfiy butun sonlar	–15; –10; –9; –8; –7; –6; –4; –3; –2; –1;

2. Rasmdagi termometrlar yordamida haroratning o‘zgarishini tushuntiring.

Yechish: rasmdagi termometrlar yordamida haroratning o‘zgarishini tushuntiramiz. Birinchisi issiqlikning oshishini ifodalasa, ikkinchisi haroratning pastlashini ko‘rsatmoqda.

3. Termometrlardagi ob-havo harorati ko‘rsatkichini aniqlang.



Javoblar: +15° 0° +23° +23° +26°

4. Bank plastik kartasiga tushgan pul miqdori musbat sonlarda, plastik hisob raqamidan olingan pul mablag‘lari esa manfiy sonlarda ifodalanadi. Quyidagi jadval asosida monitoringni o‘qing.

Yechish: bank plastik kartasiga tushgan pul miqdori musbat sonlarda, plastik hisob raqamidan yechilgan pul mablag‘lari esa manfiy sonlarda ifodalanadi. Bularni quyidagicha tushunamiz.

–23 000 so‘m pul kartadan yechildi;	+30 000 so‘m pul kartaga tushdi;
+15 000 so‘m pul kartaga tushdi;	–124 195,75 so‘m pul kartadan yechildi;
–4 000 so‘m pul kartadan yechildi;	–50 000 so‘m pul kartadan yechildi;
–50 000 so‘m pul kartadan yechildi;	–29 000 so‘m pul kartadan yechildi.

5. Kunduzgi va kechki ob-havoni tahlil qiling.

Du	Se	Chor	Pay	Ju
+12 °C +2 °C	+11 °C +2 °C	+8 °C –2 °C	+5 °C –4 °C	+11 °C –2 °C

Yechish: chorhanba kuni kunduzi +8 °C issiq tunda esa –2 °C sovuq ob-havo bo‘lishi ko‘rsatilgan. Qolgan kunlarni o‘quvchilar bilan tahlil qiling.

6. Tavsiflarga mos keladigan butun sonlarni yozing.

a) Elektr energiyasidan haqdorlik 40 ming so‘m, gazdan qarzdorlik esa 225 ming so‘m.

– Elektr energiyasidan haqdorlik: +40 000 so‘m; gazdan qarzdorlik: –225 000 so‘m;

b) Hazrati Sulton cho‘qqisi dengiz sathidan 4648 m balandlikda, Chirchiq daryosi sohili dengiz sathidan 380 m pastda.

– Hazrati Sulton cho‘qqisining dengiz sathidan balandligi: +4648 m; Chirchiq daryosi sohilining dengiz sathidan pastligi: –380 m;

c) Haroratning 40 °C ga isishi, 10 °C ga sovishi.

– Haroratning isish +40°, sovish –10°;

d) Kit okean sathidan 100 metr pastda.

– Kitning okean sathidan pastdaligi: –100;

e) Aysberg dengiz sathidan 125 metr balandlikda joylashgan.

– Aysbergning dengiz sathidan balandligi: +125 metr.

O‘quvchilar tavsiflarga mos butun sonlarni to‘g‘ri yozishlarini nazorat qiling.

7. Jadvalda shaharlardagi 2022-yil 1-yanvarga oid harorat ko‘rsatilgan.

Shaharlar	Harorat
Qohira	15 °C
Kopengagen	1 °C
Helsinki	−9 °C
Liverpul	3 °C
Moskva	−14 °C
Sidney	20 °C

a) Eng past harorat ko‘rsatilgan shahar qaysi?

b) Kopengagen va Qohiradagi harorat qanchaga farq qiladi?

c) 2003-yil 2-yanvarda Moskvada havo harorati 4 °C ga ko‘tarilgan. Moskvadagi yangi haroratni hisoblang.

Yechish: jadvalda shaharlardagi 2022-yil 1-yanvarga oid harorat ko‘rsatilgan bo‘lib, unda:

a) Eng past haroratli shahar Moskva: –14 °C;

b) Kopengagen (+1 °C) va Qohirada (+15 °C)gi haroratning farqi: +14 °C;

c) 2003-yil 2-yanvarda Moskvada havo harorati 4 °C ga ko‘tarilgan bo‘lsa, yangi harorat: – 14 °C + 4 °C = –10 °C.

8. Smartfonning ob-havo ilovasida harorat Londonda −7 °C, O‘zbekistonda esa +2 °C ni ko‘rsatdi. Londondagi harorat O‘zbekistondagidan necha gradus farq qilmoqda?

Javob: Londondagi harorat O‘zbekistondagi haroratdan 9 °C sovuq ekan.

9. Quyidagi savollarga javob bering.

a) Qanday sonlar “musbat sonlar” deyiladi? Musbat butun sonlar qanday bo‘ladi?

b) Qanday sonlar “manfiy sonlar” deyiladi? Manfiy butun sonlar qanday bo‘ladi?

c) Qanday sonlar musbat ham, manfiy ham emas?

d) Barcha natural sonlarni “butun sonlar” deyish mumkinmi? “Musbat natural sonlar” deyish-chi?

e) Do‘stingiz: “Kasrlar butun sonlardir”, – deb aytdi. Uning fikriga qo‘shilasizmi?

Ko‘rsatma: javoblarni o‘quvchilar bilan tahlil qiling.

10. Sotuvchi Salima xola bir xil miqdordagi 4 xil mahsulot sotib olib, keyinchalik ularni sotdi. Jadval asosida foyda yoki zararni aniqlang.

	Sotib olish narxi (so‘m)	**Sotish narxi (so‘m)**	**Foyda (so‘m)**	**Zarar (so‘m)**	**Savdo natijasi (so‘m)**
1	97 500	100 000	2 500		+ 2 500
2	124 000	122 000		2 000	– 2 000
3	142 000	145 000	3 000		+ 3 000
4	173 000	170 000		3 000	– 3 000
Jami	536 500	537 000	5 500	5 000	+ 500

11. Ob-havo harorati ko‘rsatkichini “+” va “–” ishoralaridan foydalanib yozing.

a) 36 °C issiq b) 17 °C issiq c) 7 °C sovuq

d) 18 °C sovuq e) 1 °C sovuq f) 1 °C iliq

Yechish: ob-havo harorati ko‘rsatkichini “+” va “–” ishoralaridan foydalanib yozamiz.

1) + 36 °C 2) – 18 °C 3) + 17 °C 4) – 1 °C 5) – 7 °C 6) + 1 °C

Musbat va manfiy butun sonlarni son o‘qida tasvirlash

Barcha o‘quvchilar	Musbat va manfiy butun sonlarni son o‘qida tasvirlash haqida tushunchaga ega.
Aksariyat o‘quvchilar	Musbat va manfiy butun sonlarni son o‘qida tasvirlay oladi.
Ba’zi o‘quvchilar	Musbat va manfiy butun sonlarni son o‘qida tasvirlash bilan birga unga doir misol va masalalar tuza oladi.

➢ *Faollashtiruvchi savollar*

1. Qanday sonlar “musbat sonlar” deyiladi? Musbat butun sonlar qanday bo‘ladi?
2. Qanday sonlar “manfiy sonlar” deyiladi? Manfiy butun sonlar qanday bo‘ladi?
3. Qanday sonlar musbat ham, manfiy ham emas?
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➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

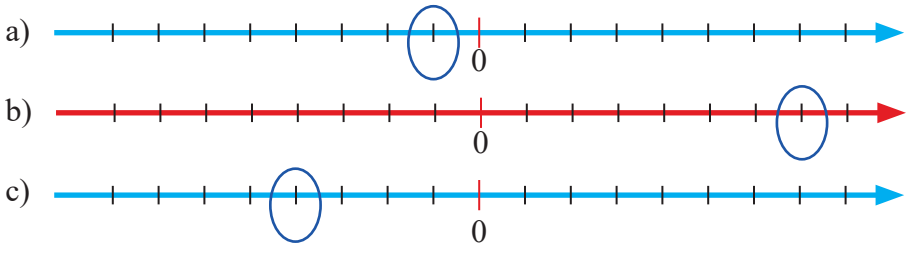
O‘quvchilar manfiy sonlar ustida amal bajarishda ishora qo‘yishda ko‘proq adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

11-, 12-misollar (99-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

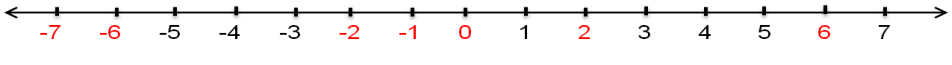
1. Sonlarning 0 soniga nisbatan joylashuvini aniqlang.



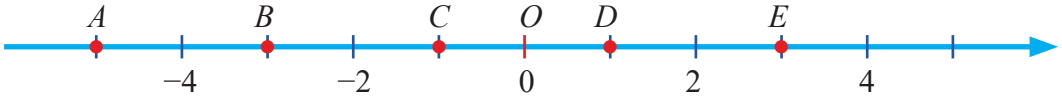
Yechish: Sonlarning 0 soniga nisbatan son o‘qida joylashuvini ko‘rib chiqamiz.
a) bir birlik chapda; b) yetti birlik o‘ngda; c) to‘rt birlik chapda.

2. Sonlar o‘qida belgilang.

Yechish: berilgan sonlarni son o‘qida belgilaymiz. Qizilda yozilgan sonlar berilgan sonlar.



3. Sonlar o‘qida harflarga mos keladigan sonlarni toping.



Javob: Sonlar o‘qida harflarga mos keladigan sonlar: A(–5); B(–3); C(–1); D(1); E(3).

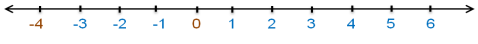
4. A(0), B(4), C(−2), D(−7), K(−3), M(6) nuqtalarni sonlar o‘qida belgilang.

Javob:



5. Tushirib qoldirilgan sonlarni toping.

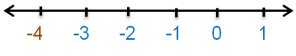
Javob: tushirib qoldirilgan sonlar ko‘k rangda berilgan.





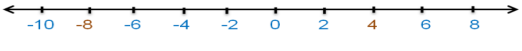
6. Bo‘sh kataklar o‘rnidagi sonlarni toping.

Javob: bo‘sh kataklar o‘rnidagi sonlar qizil rangda berilgan.



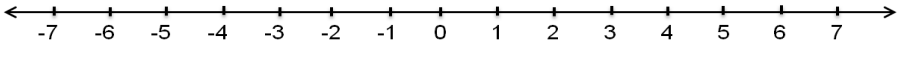






7. Sonlar o‘qini chizing va −7 nuqtadan +7 nuqtagacha nechta butun son, −7 nuqtadan +7 nuqtagacha nechta natural son borligini toping.

Javob: −7 nuqtadan +7 nuqtagacha 15 ta butun son, −7 nuqtadan +7 nuqtagacha 7 ta natural son bor.



8. Jadvalni o‘qing va tushuntiring.

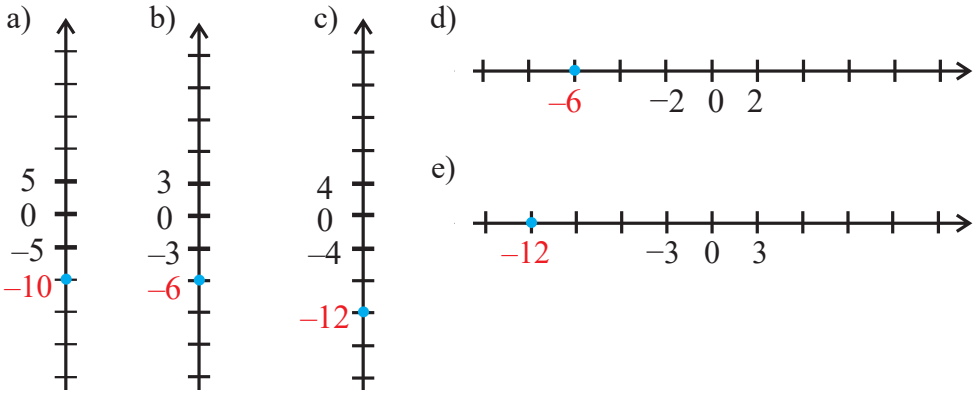
Jo‘natuvchi	Oluvchi	Amaliyot sanasi	Summa	Summaga izoh
860031***4672	860033***7225	22.12.2021 21:43	– 8 712 000.00	Jo‘natuvchining hisobidan yuborildi
		22.12.2021 15:25	10 900 000.00	Oluvchining hisobiga qabul qilindi
		21.12.2021 13:44	100 000.00	Oluvchining hisobiga qabul qilindi
		19.12.2021 17:02	– 98 000.00	Jo‘natuvchining hisobidan yuborildi
		16.12.2021 11:17	– 500 000.00	Jo‘natuvchining hisobidan yuborildi

		15.12.2021 21:49	– 100 000.00	Jo‘natuvchining hisobidan yuborildi
		15.12.2021 17:52	– 167 000.00	Jo‘natuvchining hisobidan yuborildi
		15.12.2021 14:33	101 000.00	Oluvchining hisobiga qabul qilindi

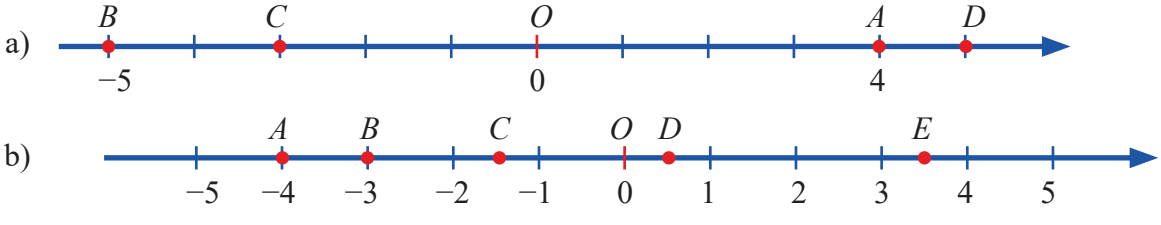
9. Birlik kesmani 10 ga teng deb olib, sonlar o‘qida berilgan sonlarni belgilang.
Javob: birlik kesma 10 ga teng holatda berilgan sonlar o‘qda qizil rangda belgilandi.



10. So‘roq belgisi o‘rnidagi sonlarni toping.
Javob: so‘roq belgisi o‘rnidagi –10; –6; –12; –6; –12 sonlarni yozamiz.



11. Nuqtalarning koordinatalarini yozing.

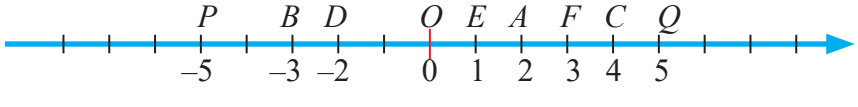


Javob: a) A(4); B(–5); C(–3); D(5); O(0).

b) A(–4); B(–3); C(–1,5); D(0,5); E(3,5).

12. Jadvaldan foydalanib son o‘qida nuqtalarni belgilang.
Javob: son o‘qida nuqtalarni quyidagicha belgilaymiz.

Nuqta	*A*	*B*	*C*	*D*	*E*	*F*	*P*	*Q*
Koordinatasi	2	–3	4	–2	1	3	–5	5



Sonning moduli

Barcha o‘quvchilar	Sonning moduli nimaligini biladi, $\lvert-23\rvert$, $-\lvert-23\rvert$, $\lvert23\rvert$ ko‘rinishidagi modullarni topadi.
Aksariyat o‘quvchilar	a) $\lvert-37\rvert+\lvert-25\rvert$ b) $\lvert519\rvert+\lvert-150\rvert$ c) $\lvert-123\rvert+\lvert453\rvert-\lvert-4\rvert\times\lvert-5\rvert$ ko‘rinishdagi amallarni bajara oladi.
Ba’zi o‘quvchilar	$\left\lvert-2\frac{1}{3}\right\rvert\times\left\lvert\frac{9}{14}\right\rvert$, $\left\lvert-\frac{4}{5}\right\rvert-\left\lvert\frac{2}{3}\right\rvert$ ko‘rinishdagi misollar bilan birga ularga doir tenglamalar qatnashgan misollarni va masalalarni yecha oladi.

➢ *Faollashtiruvchi savollar*

1. Modul nima?
2. Musbat va manfiy sonlarning modulida farq bormi? Nima uchun?
3. –5 va 1 sonlari orasida nechta raqam yotadi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar sonning modulida ishoralar qo‘yishda ko‘proq adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

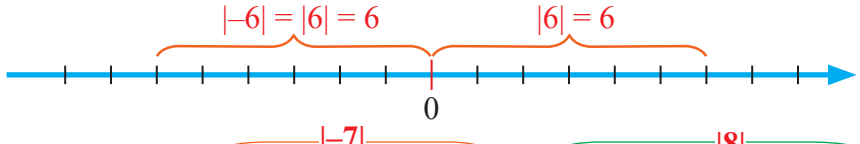
➢ *Uyga vazifa*

14-, 15-misollar (101-bet)

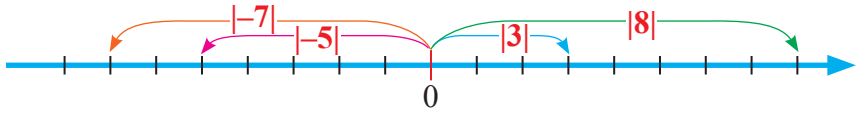
➢ *Mashqlar, ularning javoblari va yechimlari*

1. So‘roq belgisi o‘rnidagi sonlarni modulda ifodalang.

a)



b)



2. Modulli sonlarni avval o‘qing, keyin modulini toping.

a) $\lvert-23\rvert = 23$ b) $-\lvert-23\rvert = -23$ c) $\lvert23\rvert = 23$ d) $-\lvert23\rvert = -23$

e) $\lvert-\lvert-23\rvert\rvert = 23$ f) $\lvert-\lvert23\rvert\rvert = 23$ g) $\lVert-23\rVert = 23$ h) $\lVert23\rVert = 23$

3. Sonlarning modulini toping.

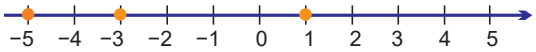
$-15 \to |-15| = 15$ $\quad -222 \to |-222| = 222$ $\quad 0 \to |0| = 0$

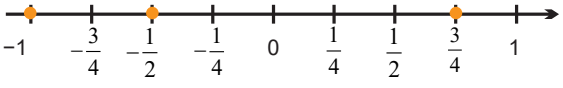
$107 \to |107| = 107$ $\quad 108 \to |108| = 108$ $\quad -61 \to |-61| = 61$

$-190 \to |-190| = 190$ $\quad 0{,}8 \to |0{,}8| = 0{,}8$ $\quad 122 \to |122| = 122$

$-45 \to |-45| = 45$ $\quad -97 \to |-97| = 97$

4. Son o‘qida belgilangan sonlarga modullari teng sonlarni toping.





Javob: a) $|-5| = 5$; $|-3| = 3$; $|1| = 1$ $\quad$ b) $|-1| = 1$; $\left|\frac{1}{2}\right| = \frac{1}{2}$; $\left|-\frac{3}{4}\right| = \frac{3}{4}$

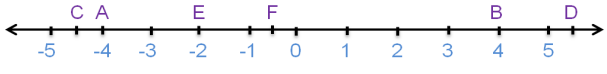
5. Hisoblang.

a) $|-37| + |-25| = 37 + 25 = 62$ $\quad$ b) $|519| + |-150| = 669$

c) $|-123| + |453| - |-4| \times |-5| = 556$ $\quad$ d) $|-99| + |-77| = 176$

e) $|-20| \times |90| = 1800$ $\quad$ f) $|1800| \div |-30| = 60$

6. Sonlar o‘qini chizing va O(0) nuqtadan quyidagi nuqtalargacha bo‘lgan masofani toping.



Javob: O(0) nuqtadan A(–4) gacha bo‘lgan masofa $|4| = 4$ ga teng;

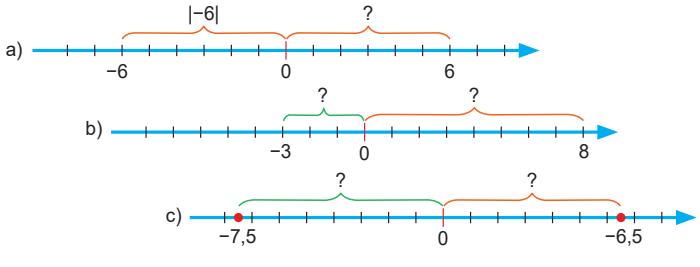
B(4)=4; $\quad$ C(–4,5)=4,5; $\quad$ D(5,5)=5,5; $\quad$ E(–2)=2; $\quad$ F(–0,5)=0,5.

7. So‘roq belgisiga mos keluvchi modullarni toping.

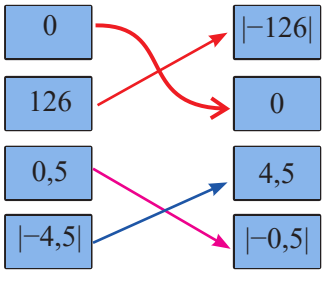
Yechish: $|-6| + |6| = 6 + 6 = 12$

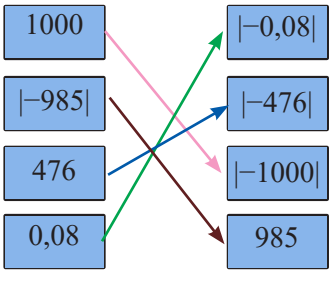
$|-3| + |8| = 3 + 8 = 11$

$|-7{,}5| + |6{,}5| = 7{,}5 + 6{,}5 = 14$



8. Modullari teng sonlarni tutashtiring.





9. Hisoblang.

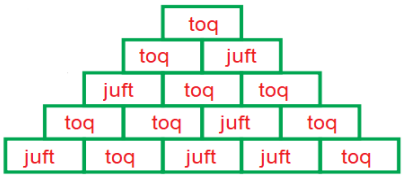
a) $|240| \div |-80| = 240 \div 80 = 3$ b) $|-710| + |-290| = 1000$

c) $|2{,}3| + |-3{,}7| = 6$ d) $|0{,}1| \times |-10| = 1$

10. Moskvada qishki harorat −10 °C, yozgi harorat +23 °C bo‘ladi. Bu haroratlarning qaysi biri suvning muzlash darajasiga yaqinroq?

Javob: Suv 0 °C da muzlaydi. Moskvada qishki harorat −10 °C, yozgi harorat +23 °C bo‘lsa, demak, qishki harorat suvning muzlash darajasiga yaqinroq.

11. Maryam g‘ishtlarga musbat butun sonlarni yozmoqda. Agar har bir g‘ishtdagi son uning pastki qismida turgan 2 ta g‘ishtdagi sonlar yig‘indisiga teng bo‘lsa, Maryam eng ko‘pi bilan nechta toq son yoza oladi?



12. Jadvalni to‘ldiring.

a	–4	–0,8	–7	24	–6	13	28	180	67	–19
$-a$	4	0,8	7	–24	6	–13	–28	–180	–67	19
$\lvert -a \rvert$	4	0,8	7	24	6	13	28	180	67	19

13. $5|b| + |a| - |-6|$ ifodaning qiymatini hisoblang.

Yechish: a) $a = 17$ va $b = 21$ b) $a = -45$ va $b = 27$ c) $a = -21$ va $b = -17$

a) $5 \times |21| + |17| - |-6| = 5 \times 21 + 17 - 6 = 116$

b) $5 \times |27| + |-45| - |-6| = 5 \times 27 + 45 - 6 = 174$

c) $5 \times |-17| + |-21| - |-6| = 5 \times 17 + 21 - 6 = 100$

14. Berilgan sonlarga qarama-qarshi sonni toping.

Yechish: berilgan sonlarga qarama-qarshi sonni ishorasini o‘zgartirish orqali topamiz.

–12 ga qarama-qarshi son 12; –122 ga qarama-qarshi son 122;

0 ga qarama-qarshi son yo‘q; 17 ga qarama-qarshi son –17;

–18; 71; 19; 37; –117; –91; –146; 63; 4,7; –0,008.

15. Har bir vaziyatning aksini ifodalovchi sonni yozing. So‘z bilan qarama-qarshi ma’noni yozing.

a) 25 000 so‘m haqdor → 25 000 so‘m qarzdor;

b) dengiz sathidan 3 500 metr pastda → dengiz sathidan 3500 metr yuqorida;

c) 21 °C issiq → 21 °C sovuq;

d) 13 kg vazn yo‘qotish → 13 kg vazn ortishi.

Butun sonlarni taqqoslash

Barcha o‘quvchilar	Son o‘qi yordamida taqqoslashni bajara oladi.
Aksariyat o‘quvchilar	–2 va 8, 4 va –7, –15 va –35 larni taqqoslaydi.
Ba’zi o‘quvchilar	Yuqoridagi ko‘rinishdagi misollar bilan birgalikda ularga doir mantiqiy chizmalarni hisoblay oladi.

➢ *Faollashtiruvchi savollar*

1. Modul nima?
2. Musbat va manfiy sonlarning modulida farq bormi? Qanday?
3. 78 va 65 sonlari orasida nechta raqam yotadi?
4. 9 va 18 sonlaridan qaysi biri katta?
5. 8 va 11 sonlaridan qaysi biri katta?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar taqqoslashda ishoralarni ko‘proq adashtiradi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

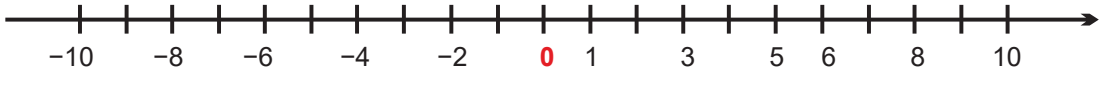
➢ *Uyga vazifa*

9-, 10-misollar (103-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Son o‘qi yordamida taqqoslang.

Yechish: son o‘qi yordamida sonlarning joylashuv o‘rniga qarab taqqoslash qoidasini eslatish kerak.



Javoblar: a) $-8 < 1$; b) $-6 < 6$; c) $6 < 8$; d) $-10 < -6$.

2. Taqqoslang.

a) $2 < 87$ b) $10 > -10$ c) $-22 > -102$ d) $3 > -1$ e) $-4 < 2$

f) $-4 < 8$ g) $-2 > -8$ h) $-15 < -7$ i) $-7 < 1$ j) $2 > -3$

3. Meteorolog dunyoning to‘rtta shahridagi haroratni qayd etdi. Bu shaharlarni harorat bo‘yicha o‘sish tartibida ayting. Eng issiq va eng sovuq shaharlarni belgilang.

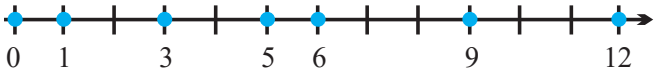
Toshkent: + 12 °C eng issiq;

Berlin: – 9 °C eng sovuq shahar.

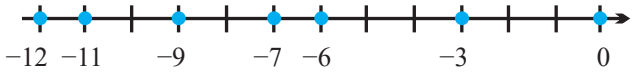
O‘sish tartibi: –9; –7; –6, +5; +12

Shaharlar	Harorat
London	+5 °C
Anqara	−6 °C
Moskva	−7 °C
Berlin	−9 °C
Toshkent	+12 °C

4. Son o‘qidagi sonlarni o‘sish va kamayish tartibida yozing.



a) O‘shish tartibida: 0; 1; 3; 5; 6; 9; 12 kamayish tartibida: 12; 9; 6; 5; 3; 1; 0



b) O‘shish tartibida: –12; –11; – 9; –7; –6; –3; 0
kamayish tartibida: 0; –3; –6; –7; –9; –11; –12

5. Savollarga javob bering.

a) Qaysi ifodada 85 va 19 sonlari to‘g‘ri taqqoslangan?

A) 85 < 19 B) 19 = 85 C) 85 > 19 D) 19 > 85

b) Qaysi son katta, 71 yoki 710? A) 71 B) 710

c) Qaysi son kichik, −17 yoki −11? A) −17 B) −11

d) Dehqon bu yil 2350 ta qovoq yetishtirdi. O‘tgan yili u 1988 ta qovoq yetishtirgan edi. Shu ikki miqdorni taqqoslovchi ifodani yozing.

A) 2350 > 1988 B) 2350 < 1988 C) 1988 = 2350 D) 1988 > 2350

O‘quvchilardan xulosalarini asoslashni so‘rang. Masalan, sonlar o‘qi, xona birliklari orqali.

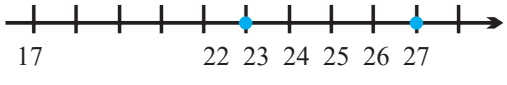
6. Son o‘qida belgilangan sonlarni taqqoslang.

a) 180 < 230 b) 23 < 27 c) 17 < 24 d) – 20 < 10

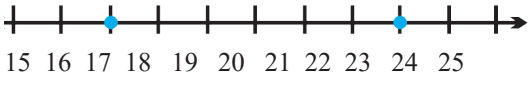
a)



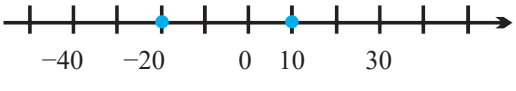
b)



c)



d)

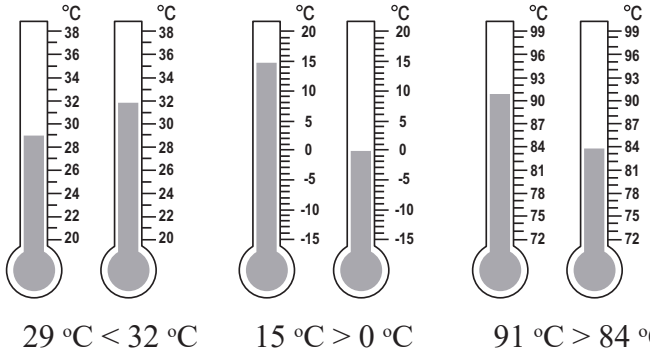


7. Berilgan sonlarni taqqoslang va “>”, “<” yoki “=” belgilaridan mosini qo‘ying.

a) +7 < + 17 b) + 53 > –53 c) 0 > –25 d) –108 > –208

e) –12 < + 14 f) – 26 < 0 g) +5 > –60 h) –10 < 0

8. Har bir juft termometrni taqqoslang.



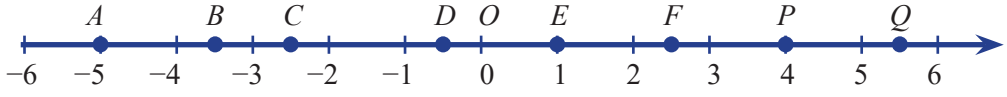
29 °C < 32 °C 15 °C > 0 °C 91 °C > 84 °C

9. Berilgan butun sonlardan oldin va keyin keladigan butun sonlarni yozing.

a) –8; –7; –6 b) –1001; –1000; –999 c) 23; 24; 25

d) –666; –665; –664 e) –40; –39; –38 f) –1; 0; 1

10. Sonlar nurida taqqoslang.

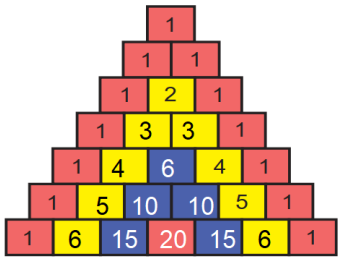


Javoblar: a) A(–5) < B(–3,5) b) B(–3,5) < P(4) c) D(–0,5) < F(2,5)

d) C(–2,5) < Q(5,5) e) E(1) < F(2,5)

11. Bo‘sh kataklarni to‘ldiring.

Ko‘rsatma: *bu yerda piramidaning yuqorisidan boshlab berilgan qo‘shishdagi qonuniyatni o‘quvchilarga tushuntiring.*



Butun sonlarni qo‘shish

Barcha o‘quvchilar	Bir xil ishorali sonlarni qo‘shadi.
Aksariyat o‘quvchilar	$\|x\| + \|-25\|$, bu yerda $x = -25$ va $-144 + (-15) + (-85)$ ko‘rinishidagi amallarni bajara oladi.
Ba’zi o‘quvchilar	Yuqoridagi ko‘rinishdagi misollar bilan birgalikda ularga doir mantiqiy chizmalarni ham hisoblay oladi.

➢ *Faollashtiruvchi savollar*

1. Modul nima?
2. Musbat sonni musbat songa qo‘shganda ishorasi manfiy bo‘ladimi? Nima uchun?
3. –78 + (–65) sonlarining yig‘indisi necha?
4. –9 va 18 sonlaridan qaysi biri katta?
5. –56 + (–9) ifodada qo‘shiluvchining moduli nechaga teng?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar butun sonlarni qo‘shishda ishoralarini ko‘proq adashtiradi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

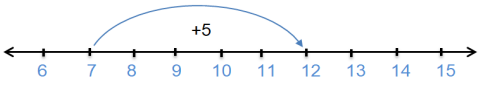
24-, 25-misollar (107-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

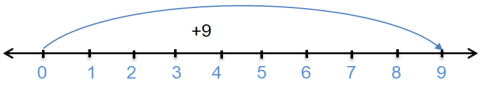
1. Sonlar o‘qidan foydalanib musbat butun sonlarni qo‘shing.

a) (+7) + (+5) b) 0 + (+9) c) (+6) + (+3) d) (+1) + 0
e) (+5) + (+8) f) (+5) + (+3) g) (+8) + 0 h) (+3) + (+8)

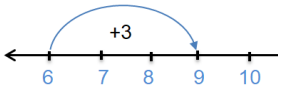
a)



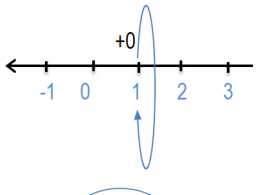
b)



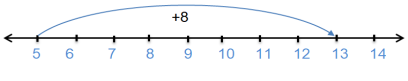
c)



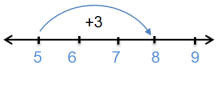
d)

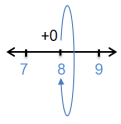


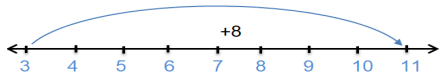
e)



f)



g) 

h) 

2. Sonlar o‘qidan foydalanib manfiy butun sonlarni qo‘shing.

a) (−3) + (−7) b) (−2) + (−6) c) (−8) + (−4) d) 0 + (−1)

e) (−1) + 0 f) (−5) + (−3) g) (−8) + (−1) h) (−4) + (−9)

Ko‘rsatma: 1-misolga qarab bajartiring.

3. Butun sonlar yordamida savollarga javob toping.

a) Harorat +4 °C dan 15 °C ga ko‘tarildi. Endi harorat qancha bo‘ldi?

b) Harorat −3 °C dan 16 °C ga ko‘tarildi. Endi harorat qancha bo‘ldi?

c) Harorat 0 °C dan 4 °C ga pasaydi. Endi harorat qancha bo‘ldi?

d) Harorat −8 °C dan 4 °C ga ko‘tarildi. Endi harorat qancha bo‘ldi?

Javob: a) + 4 °C + (+ 15 °C) = + 19 °C b) –3 °C + (+ 16 °C) = + 13 °C

c) 0 °C – 4 °C = – 4 °C d) – 8 °C + (+ 4 °C) = – 4 °C

4. Hisoblang.

a) −12 + (−13) = – 25 b) 0 + (−6) = – 6 c) 47 + (+131) = 178

d) −16 + (−14) = – 30

5. Ifodaning qiymatini toping.

a) $|x| + |-25|$, bu yerda $x = -25$ **Javob:** $|-25| + |-25| = 25 + 25 = 50$

b) $|a| + |-15|$, bu yerda $a = -33$ **Javob:** 48

c) $|a| - |b|$, bu yerda $a = -150$, $b = -138$ **Javob:** 12

d) $|a| - |b| + |c|$, bu yerda $a = 27$, $b = 87$, $c = 95$ **Javob:** 35

6. Abror 1 668 000 so‘m va 2 454 000 so‘mga ikkita kompyuter sotib oldi. U jami qancha pul sarfladi?

Yechish. U hammasi bo‘lib 1 668 000 + 2 454 000 = 4 122 000 so‘m sarfladi.

7. Hisoblang.

a) −13 + (−19) = – 32 b) −26 + (−76) = – 102 c) 100 + 300 = 400

d) −143 + (−155) = – 298 e) −314 + (−112) = – 426 f) −55 + (−29) = – 84

8. Sonlar o‘qidan foydalanib qo‘shing.

a) (+6) + (+2) = 8 b) (−10) + (−1) = –11 c) (+9) + 0 = 9

(−6) + (−2) = –8 (+10) + (+1) = 11 (−9) + 0 = –9

9. O‘yindagi o‘zaro qarama-qarshi sonlarning barchasini toping.

Ko‘rsatma: *o‘yindagi o‘zaro qarama-qarshi sonlarning barchasi belgilab ko‘satiladi.*

10. 2021-yilda bir mamlakat aholisi 906 450 600 kishi bo‘lgan bo‘lsa, keyingi yili 9 889 700 kishiga ko‘paydi. 2022-yilda bu davlatning aholisi qancha bo‘ladi?

Yechish: 2022-yilda bu davlatning aholisi qancha ekanini qo‘shishni bajarib topamiz: 906 450 600 + 9 889 700 = 916 340 300 kishi.

11. Bir xil ishorali sonlarni ustun shaklida qo‘shing.

(−492)	(−939)	(−291)	(−782)	(−526)	(−388)
+(−614)	+(−301)	+(−992)	+(−488)	+(−625)	+(−883)
–1106	–1240	–1283	–1270	–1151	–1271

12. Sonlar o‘qidan foydalanib qo‘shing.

a) 7 + (−5) = 2 b) 0 + (−9) = – 9 c) (−8) + 3 = – 5 d) (−1) + 0 = – 1

e) (−1) + 7 = 6 f) 3 + (−6) = – 3 g) (−10) + 5 = – 5 h) 0 + (−11) = – 11

13. Bir kunlik aholi soni bo‘yicha statistik ma’lumot tayyorlandi. 368 427 nafar aholisi bor tumanda shu kuni 17 ta tug‘ilish va 4 ta o‘lim qayd etildi. Bir kunda tuman aholisi soni qanchaga o‘zgardi?

Yechish: 368 427 + 17 + (–4) = 368 440 nafar bo‘ldi.

14. Hisoblang.

a) 12 + (−4) = 8 b) −27 + 29 = 2 c) −79 + 19 = –60

d) 16 + (−81) = –65 e) 44 + (−55) = –11 f) −77 + (−77) = –154

15. Qaysi ifodalarning natijasi manfiy yoki musbat ekanini hisoblamasdan toping.

a) 122 + (−4) b) −270 + 209 c) −709 + 109

d) (−33) + (−7) e) (−212) + (−66) f) (−88) + (−40)

a) musbat b) manfiy c) manfiy d) manfiy e) manfiy f) manfiy

16. Hisoblang.

a) −15 + (−15) + (−15) + (−15) = –60 b) −12 + 19 + (−18) + (−11) = –22

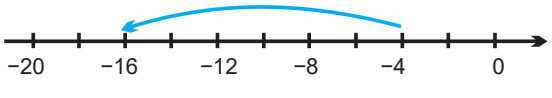
c) −39 + (−12) + 12 + 21 = –18 d) 16 + 12 + 12 + (−14) = 26

17. Beshta 5 raqami, arifmetik amallar va qavsdan foydalanib −555, −55, −5, 0, 5, 55, 555 sonlarini hosil qila olasizmi?

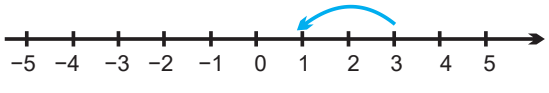
(5 – 5) – 555 = – 555 5 × (5 – 5) – 55 = – 55

(5 – 5) ÷ (5 + 5) – 5 = – 5 *Qolgan natijalarni o‘quvchilar bilan hosil qiling.*

18. Sonlar o‘qiga mos ifodalarni toping va hisoblang.



−16 + (4) = –12 | –4 + (−12) = –16



3 + (−2) = 1 | 3 + (−1) = 2

19. Bo‘sh joylarni to‘ldiring.

a) (−16) + (+3) = −13 b) 13 + (–29) = −16 c) (−18) + (+4) = −14

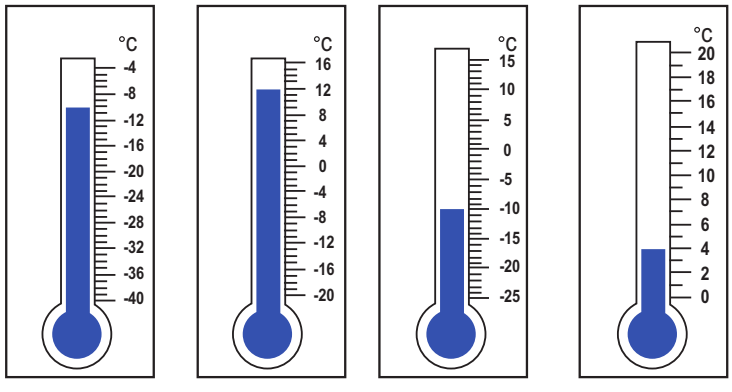
d) $18 + (-18) = 0$ e) $(+2) + (-19) = -17$ f) $(-16) + (-2) = -18$

20. Ifodalar qiymatini $x = 5$, $y = -3$ va $z = 7$ bo‘lganda toping.

a) $(-y) + 20$ b) $(-z) + x + (-16)$ c) $x + 15 + (-x)$

Javob: a) $(-y) + 20 = 3 + 20 = 23$ b) -18 c) 15

21. Barcha temperaturalar 8° ga ko‘tarilsa, ko‘rsatkichlar qanday o‘zgaradi?



$-10\ ^{o}C + 8\ ^{o}C = -2\ ^{o}C$; $12\ ^{o}C + 8\ ^{o}C = 20\ ^{o}C$; $-10\ ^{o}C + 8\ ^{o}C = -2\ ^{o}C$; $4\ ^{o}C + 8\ ^{o}C = 12\ ^{o}C$.

23. Qulay usullarda hisoblang.

a) $-14 + ((-9) + (-11)) = -14 + (-20) = -34$ b) $-21 + (-19) + 13 = -27$

c) $-11 + (-18) + (-19) = -48$ d) $-18 + 15 + 12 = 9$

e) $12 + (-15) + (-10) = -13$ f) $-15 + (-18) + (-15) = -48$

24. Yig‘indilar nimaga teng?

a) $0 + (-44) = -44$ b) $(-55) + (-55) = -110$ c) -110 d) -290

25. Hisoblang.

a) $112 + 144 = 256$ b) $125 + 100 = 325$ c) $-16 + 0 = -16$

d) $-99 + (-100) = -199$ e) $-33 + (-37) = -70$ f) $-754 + (-99) = -853$

g) $-37 + (-25) = -62$

26. Jadvallarni to‘ldiring.

1

+	−12	6
−3	−15	3
7	−5	13

2

+	5	−2
−9	−4	−11
24	29	22

3

+	−14	−8
14	0	6
1	−13	−7

4

+	−16	−5
−10	−26	−15
−17	−33	−22

27. Qulay usul bilan hisoblang.

a) $1 + (-2) + 3 + (-4) + 5 + (-6) + 7 + (-8) = (1 + 3 + 5 + 7) + (-2 + (-4) + (-6) + (-8))$
$= 16 + (-20) = -4$

b) $5 + 9 + 12 + 26 + (-3 + (-7) + (-11) + (-18)) = 52 + (-39) = 13$

Butun sonlarni ayirish

Barcha o‘quvchilar	Musbat va manfiy sonlarni ayirish amalini bajara oladi.
Aksariyat o‘quvchilar	$\|x\| - \|-5\|$, bu yerda $x = -17$ va $-19 - (-14) - (-675)$ ko‘rinishdagi amallarni bajara oladi.
Ba’zi o‘quvchilar	Yuqoridagi ko‘rinishdagi misollar bilan birgalikda ularga doir mantiqiy chizmalarni ham hisoblay oladi.

➢ *Faollashtiruvchi savollar*

1. Modul nima?
2. Musbat sondan musbat sonni ayirganda ishorasi manfiy bo‘ladimi? Nima uchun?
3. –78 – (–6) sonlarining yig‘indisi necha?
4. –9 – 18 ayirmaning ishorasi qanday bo‘ladi?
5. Turli ishorali butun sonlarni ayirish uchun nima qilish kerak?
6. –89 – 56 ifodasida kamayuvchi necha?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar ayirishda ishoralarda ko‘proq adashadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.. Ko‘rgazmalar, tarqatma va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

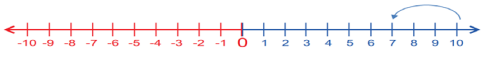
➢ *Uyga vazifa*

21-, 23-misollar (111-bet)

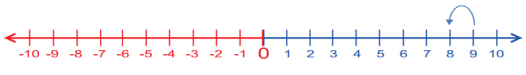
➢ *Mashqlar, ularning javoblari va yechimlari*

1. Sonlar o‘qidan foydalanib ayiring.

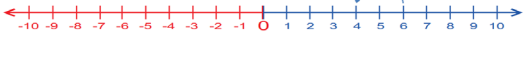
a) $(+10) - (+3) = 7$



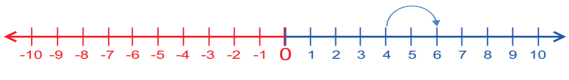
b) $(+9) - (+1) = 8$



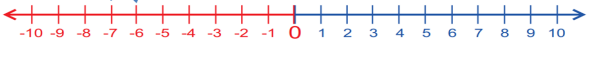
c) $(+6) - 2 = 4$



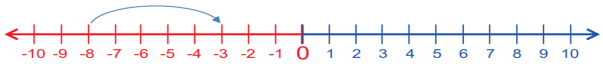
d) $(+4) + 2 = 6$



e) $(-7) + 1 = -6$



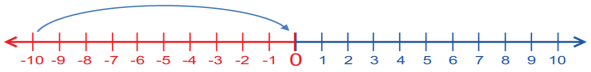
f) $(-8) + 5 = -3$



g) (−2) + 0 = −2



h) (−10) + 10 = 0



2. Bo‘sh joylarni to‘ldiring.

a) –16 + 16 = 0 b) 28 + (–28) = 0 c) 45 – 45 = 0

d) –3 + 1 = –2 e) 2 – 6 = –4 f) –9 – (–7) = –2

3. Solihaning telefoni 27 000 so‘mlik tarifda. Uning telefon hisob raqamiga otasi 15 000 so‘m o‘tkazdi. Telefon tarifi uchun yana qancha to‘lash kerak?

Yechish: 27 000 – 15 000 = 12 000 so‘m

4. Butun sonlarni ayiring.

a) –81 – (–18) = –63 b) –13 – (–44) = 31 c) –12 – (–77) = 65 d) +26 – (+22) = 4

e) –16 – (–71) = 55 f) –18 – (–28) = 10 g) –24 – (–33) = 9 h) –10 – (–41) = 31

5. Butun sonlarni qo‘shing.

a) –13 + 5 + (–4) + (–5) = –13 + (–4) = –17

b) 12 + 7+ (–13) + 18 = 12 + 18 + 7 + (–13) = 24

c) –13 + 8 + 11 + (–13) = –7 d) 1 + (–20) + (–16) + 4 = –31

e) 20 + (–6) + (–5) + 17 = 26 f) –12 + (–19) + (–5) + (–4) = –40

6. Jadvalni to‘ldiring.

a	*b*	*a* + *b*	*a* − *b*
−4	−2	−6	−2
−9	−3	−12	−6
−8	−8	−16	0
−20	−5	−25	−15

7. Ixtiyoriy 9 ta manfiy sonni shunday joylashtiringki, ustuni va satrlarining yig‘indisi a) −6; b) −15; c) − 20 ga teng bo‘lsin. Sonlar takrorlanishi mumkin.

a)

-1	-2	-3	-6
-2	-3	-1	-6
-3	-1	-2	-6
-6	-6	-6	

b)

-4	-5	-6	-15
-5	-6	-4	-15
-6	-4	-5	-15
-15	-15	-15	

c)

-5	-7	-8	-20
-7	-8	-5	-20
-8	-5	-7	-20
-20	-20	-20	

8. Ayirmalar nimaga teng?

a) −6 − 5 = −11 b) −3 − 8 = −11 c) −5 − 19 = −24 d) −6 − 30 = −36

e) −4 − 3 = −7 f) −24 − 22 = −46 g) −29 − 24 = −53 h) −12 − 24 = −36

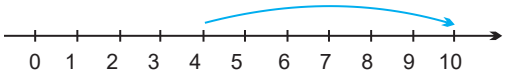
9. Hisoblang.

a) −7 − (+13) = −20 b) −5 − (+8) = −13 c) −29 − (+21) = −50 d) −8 − (+5) = −13

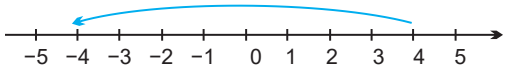
e) 8 − (−8) = 16 f) 14 − (−19) = 33 g) 3 − (−14) = 17 h) 12 − (−24) = 36

10. Modellarga mos ifodalar tuzib, qiymatini toping.

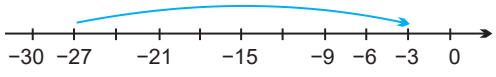
a)



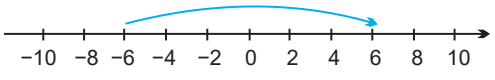
b)



c)



d)



a) $4 + 6 = 10$ b) $4 - 8 = -4$ c) $-27 + 24 = -3$ d) $-6 + 12 = 6$

11. Ifodalarni taqqoslang.

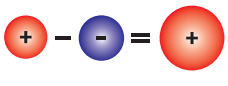
a) $8 - (-18) = 26$ $-3 - (-4) = 1$
$26 > 1$

b) $-12 - 7 = -19$ $26 - (-22) = 48$
$-19 < 48$

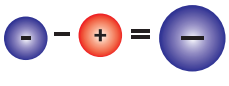
c) $6 - (-7) = 13$ $-8 - (-28) = 20$
$13 < 20$

b) $24 - (-3) = 27$ $-10 - (-1) = -9$
$27 > -9$

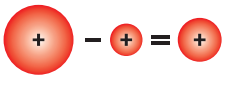
12. Qanday qonuniyatlar berilgan? Xulosangizni tushuntiring.



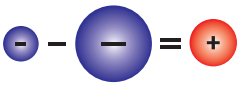
– musbat sondan manfiy sonni ayirsak, musbat son hosil bo‘ladi;



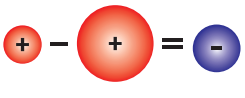
– manfiy sondan musbat sonni ayirsak, manfiy son hosil bo‘ladi;



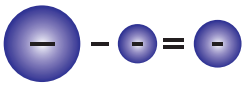
– katta musbat sondan kichik musbat sonni ayirsak, musbat son hosil bo‘ladi;



– moduli kichik manfiy sondan moduli katta manfiy sonni ayirsak, musbat son hosil bo‘ladi;



– kichik musbat sondan katta musbat sonni ayirsak, manfiy son hosil bo‘ladi;



– moduli katta manfiy sondan moduli kichik manfiy sonni ayirsak, manfiy son hosil bo‘ladi.

13. $2 * 4 * 6 * 8 * 10 * 12 * 14 * 16$ ifodadagi yulduzchalar o‘rniga “+” yoki “–” ishoralarini qo‘yib, -80, 15, 10, -16 sonlaridan qaysilarini hosil qilish mumkin?

Yechish: Berilgan sonlarning yig‘indisi 72 ga teng, shuning uchun hammasi manfiy bo‘lsa ham, yig‘indisi -80 ga teng bo‘lmaydi;

15 ga ham teng bo‘la olmaydi, chunki barcha sonlar juft sonlar, ularning yig‘indisi ham, ayirmasi ham juft son bo‘ladi;

10 ga ham teng bo‘la olmaydi, 10 dan boshqa barcha sonlar yig‘indisi 62 ga teng. 10 dan boshqa juft sonlarni ikkita, yig‘indisining modullari teng va toq son bo‘ladigan, qarama-qarshi ishorali sonlar yig‘indisi ko‘rinishida ifodalab bo‘lmaydi, ya’ni $31 + (-31)$ kabi;

-16 bo‘ladi: $(14 + 10 + 4) - (12 + 8 + 6 + 2) - 16 = -16$.

14. Bo‘sh joylarni to‘ldiring.

a) (−3)+ (–6) + 7 = −2
b) 4 + (−7) + 8 = 5
c) –10 + (−1) + (−9) = −20
d) 4 + (−5) + (−3) = −4
e) 10 + (−6) + (−8) = −4
f) (−2) + (−3) + 6 = 1

15. Savollarga javob yozing.

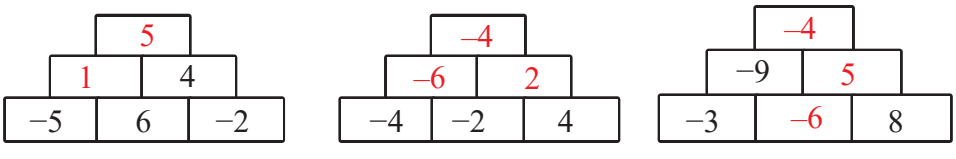
1-savol. Yarim tunda Toshkentda havo harorati −2 °C edi. Ertalab soat 9 da 5 °C bo‘ldi. Harorat necha darajaga ko‘tarildi?

2-savol. Odilning telefon hisob raqamida −2750 so‘m bor. Agar u 10000 so‘m to‘lasa, hisobida qancha pul bo‘ladi?

1-savolga **Javob:** 5 °C – (–2) °C = 7 °C, ya’ni 7 °C ga havo harorati ko‘tarilgan.

2-savolga **Javob:** Demak, telefon hisob raqamida –2 750 + 10 000 = 7 250 so‘m bo‘ldi.

16. Bo‘sh kataklarni to‘ldiring.

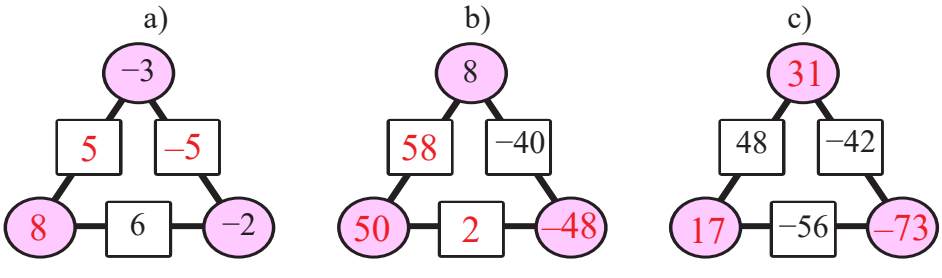


17. Nuqtalar orasidagi masofani toping.

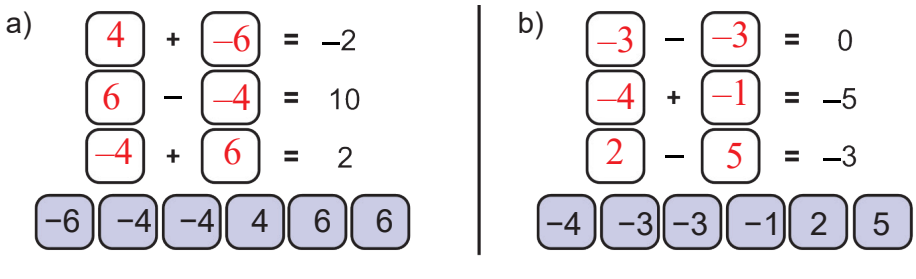
Koordinata o‘qidagi o‘ngdagi nuqtaning turgan qiymatidan chapdagi nuqtaning turgan qiymati ayriladi, shunda nuqtalar orasidagi masofa hosil bo‘ladi.

a) (−3) – (−7) = 4 birlik
b) +12 – (−12) = 24 birlik
c) +8 – 0 = 8 birlik
d) −9 – (−16) = 7 birlik
e) +6 – (−10) = 16 birlik
f) 0 – (−5) = 5 birlik.

19. Bo‘sh joylarni to‘ldiring.



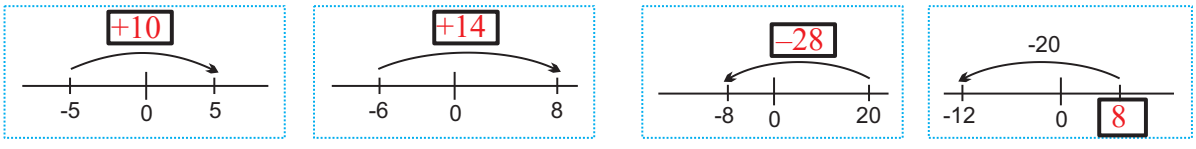
20. Mos sonlarni qo‘yib natijani tenglang.



21. Quyidagilarni ayiring.

a) (+10) – (+15) = –5 b) +1– (–9) = 10 c) –33 – (+27) = –60
d) – 20 – (–16) = –4 e) –21 – (–8) = –13 f) –12 – (+6) = –18
g) 0 – (–8) = 8 h) – 3 – (–6) = 3

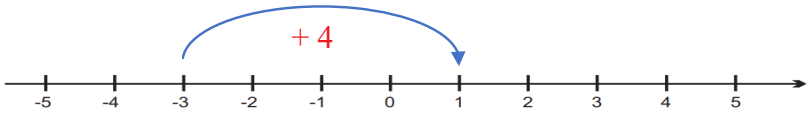
22. Bo‘sh kataklarni to‘ldiring.



24. Son o‘qidan foydalanib hisoblang.

a) 6 + (−3) = 3 b) +4 − (+2) = 2 c) 8 + (+1) = 9 d) −2 + (+4) = 2
e) −3 − (−4) = 1 f) −10 + (+10) = 0 g) 6 − (+6) = 0 h) −3 + (−2) = –5
i) −1 + (+2) = 1 j) −7 − (+4) = –11

Masalan: e) −3 − (−4) = –3 + 4 = 1



Butun sonlarni ko‘paytirish

Barcha o‘quvchilar	Musbat va manfiy sonlarni ko‘paytirish amalini bajara oladi.
Aksariyat o‘quvchilar	$(-9) \times __ = -36$ noma’lumni topishni va $-19 \times (+14) \times (-195)$ ko‘rinishidagi amallarni bajara oladi.
Ba’zi o‘quvchilar	Yuqoridagi misollar bilan birgalikda ularga doir mantiqiy chizmalarni ham chiza oladi.

➢ *Faollashtiruvchi savollar*

1. Butun sonni nolga ko‘paytirsa, necha bo‘ladi?
2. –78 va (–6) sonlarining ko‘paytmasi nechaga teng?
3. –9 va –11 sonlari ko‘paytmasining ishorasi qanday bo‘ladi?
4. Turli ishorali butun sonlarni ko‘paytirish uchun nima qilish kerak?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar ko‘paytirishda ko‘pincha ishoralarni adashtirishadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmalar, tarqatma va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

10-, 11-misollar (113-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Butun sonlarni ko‘paytiring.

Ko‘paytirishda bir xil ishorali sonlar ko‘paytmasi musbat, har xil ishorali sonlar ko‘paytmasi manfiy bo‘lishiga e’tibor bering.

a) $18 \times (-6) = -108$ b) $-7 \times (-1) = 7$ c) $8 \times (-1) = -8$ d) $(-8) \times (-3) = 24$

e) $(-2) \times (-9) = 18$ f) $-16 \times 4 = -64$ g) $-16 \times (-2) = 32$ h) $(-5) \times (-7) = 35$

2. Jadvalni to‘ldiring.

×	–11	12	–2
–9	99	–108	18
7	–77	84	–14
–6	66	–72	12

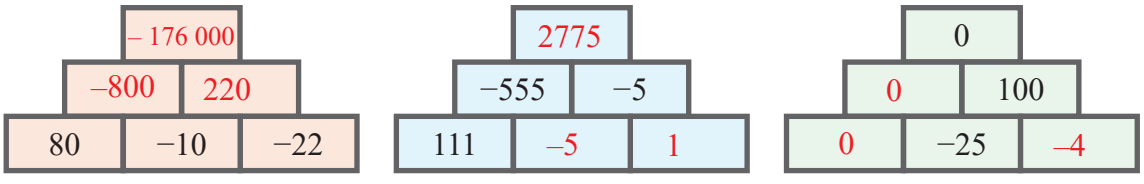
×	9	–10	1
–7	–63	70	–7
–9	–81	90	–9
3	27	–30	3

×	–12	8	–9
5	–60	40	–45
–6	72	–48	54
–7	–84	–56	63

3. $-9, -7, -5, 2, 4, 6$ sonlar orasidan ixtiyoriy ikkitasi tanlab olindi va bir-biriga ko‘paytirildi. Eng kichik son nechaga teng bo‘lishi mumkin?

Yechish: -9 va 6 butun sonlarining ko‘paytmasi eng kichik bo‘ladi: $-9 \times 6 = -54$.

6. Ko‘paytirish amali orqali bo‘sh kataklarni to‘ldiring.



7. Kim tez hisoblaydi?

−15	–180
1	12
3	36
7	84
9	108
12 ga ko‘paytiramiz	

−135	–2025
−75	–1125
−45	–675
165	2475
195	2925
15 ga ko‘paytiramiz	

−10	–130
−5	–65
−1	13
0	0
14	182
13 ga ko‘paytiramiz	

8. Hisoblang.

a) $8 \times (-50) = -400$ b) $5 \times 70 = 350$ c) $-2 \times (-30) = 60$ d) $-3 \times (-30) = 90$

e) $-1 \times 50 = -50$ f) $7 \times (-30) = -210$ g) $0 \times 40 = 0$ h) $-4 \times (-40) = 160$

9. Jadvalni to‘ldiring.

×	−2	5	–6	4	3	−4
6	–12	30	–36	24	18	–24
–2	4	–10	12	–8	–6	8
–1	2	–5	6	–4	–3	4
–3	6	–15	18	–12	–9	12

10. Berilgan sonlardan foydalanib tengliklar tuzing.

24; −12; −3; −4; −48; −6; 2; −8

a) $-4 \times 2 = -8$ b) $-12 \times (-6) = 72$ c) $(-12) \times (-3) = 36$

Butun sonlarni bo‘lish

Barcha o‘quvchilar	Musbat va manfiy sonlarni bo‘lish amalini bajara oladi.
Aksariyat o‘quvchilar	Berilgan sonlardan foydalanib tengliklar tuza oladi va noma’lum tarkibiy qismlarni topa oladi.
Ba’zi o‘quvchilar	Yuqoridagilar bilan birgalikda ularga doir mantiqiy chizmalarni ham hisoblay oladi.

➢ *Faollashtiruvchi savollar*

1. Nolni nolga bo‘lsa, necha bo‘ladi? Nima uchun?
2. Musbat sonning (–1) bo‘linmasi necha?
3. –9 va –11 sonlari bo‘linmasining ishorasi qanday bo‘ladi?
4. Turli ishorali butun sonlarni bo‘lish uchun nima qilish kerak?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar bo‘lishda ko‘pincha ishoralarni adashtiradi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak. Ko‘rgazmalar, tarqatma va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi

➢ *Uyga vazifa*

5-misollar (114-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Butun sonlarni bo‘ling.

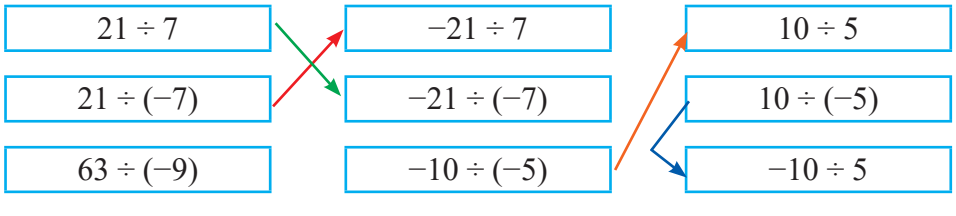
Bo‘lishni bajarishda bir xil ishorali sonlar bo‘linmasi musbat, har xil ishorali sonlar bo‘linmasi manfiy bo‘lishiga e’tibor bering.

a) $-6 \div 1 = -6$ b) $-24 \div 6 = -4$ c) $-7 \div 1 = -7$ d) $-7 \div 7 = -1$
e) $-54 \div 9 = -6$ f) $-36 \div 4 = -9$ g) $9 \div (-3) = -3$ h) $-1 \div (-1) = 1$
i) $-28 \div (-4) = 7$ j) $9 \div (-9) = -1$

2. Noma’lumlarni toping.

a) $-63 \div (-9) = 7$ b) $-84 \div 7 = (-12)$ c) $(-99) \div (-9) = 11$
d) $-9 \div 9 = (-1)$ e) $54 \div 6 = 9$ f) $63 \div (-8) = (-7)$
g) $70 \div 7 = 10$ h) $-32 \div (-4) = 8$ i) $(-60) \div 6 = (-10)$

3. Natijasi o‘zaro teng bo‘lgan ifodalarni belgilang.



5. Hisoblang.

a) $(-12) \div 2 = -6$ b) $(-32) \div 4 = -8$ c) $(-20) \div 5 = -4$ d) $30 \div (-6) = -5$

e) $(-16) \div 4 = -4$ f) $42 \div (-7) = -6$ j) $(-12) \div 2 = -6$ h) $(-36) \div (-3) = 12$

i) $(-50) \div 10 = -5$ j) $(-88) \div 11 = -8$ k) $30 \div (-5) = -6$ l) $(-72) \div (-6) = 12$

7. Noma'lum tarkibiy qismlarni toping.

a) $\boxed{17} \times (-5) = -85$ b) $\boxed{-88} \div 22 = -4$ c) $\boxed{-4} \times (-13) = 52$

d) $-8 \times 12 = \boxed{-96}$ e) $70 \div (-35) = \boxed{-2}$ f) $-44 \div \boxed{22} = -2$

9. Bo'sh kataklarni to'ldirib, xulosalaringizni yozing.

	−4	−3	−2	−1	0	1	2	3	4
−4	16	12	8	4	0	−4	−8	−12	−16
−3	12	9	6	3	0	−3	−6	−9	−12
−2	8	6	4	2	0	−2	−4	−6	−8
−1	4	3	2	1	0	−1	−2	−3	−4
0	0	0	0	0	0	0	0	0	0
1	−4	−3	−2	−1	0	1	2	3	4
2	−8	−6	−4	−2	0	2	4	6	8
3	−12	−9	−6	−3	0	3	6	9	12
4	−16	−12	−8	−4	0	4	8	12	16

Ko'rsatma: bo'sh kataklarni ko'paytirish amalini bajarib to'ldiramiz. Ko'paytirishdagi ko'paytmalarning takrorlanishini tahlil qilamiz.

10. Sonlarning mosini qo'yib to'g'ri tenglik hosil qiling.

Ko'rsatma: o'quvchilar uyda mustaqil boshqa ko'rinishlarini bajarishini nazorat qiling. Namuna uchun bitta holatni keltiramiz.

$\boxed{-7} - \boxed{8} = \boxed{-15}$

$\boxed{-7} + \boxed{-8} = \boxed{-15}$

$\boxed{-11} \times \boxed{12} = \boxed{-132}$

$\boxed{-80} \div \boxed{-10} = \boxed{8}$

Butun sonlar ustida topshiriqlar

Barcha o‘quvchilar	Musbat va manfiy sonlar ustida topshiriqlarni bajara oladi.
Aksariyat o‘quvchilar	Berilgan butun sonlardan foydalanib tengliklar tuza oladi va noma’lum tarkibiy qismlarni topa oladi.
Ba’zi o‘quvchilar	Yuqoridagi ko‘rinishdagi misollar bilan birgalikda ularga doir mantiqiy chizmalarni ham hisoblay oladi.

➢ *Faollashtiruvchi savollar*

1. Butun sonni nolga bo‘lish mumkinmi? Nima uchun?
2. Musbat sonning (–1)ga ko‘paytmasi qanday son?
3. –9 va –11 sonlari yig‘indisining ishorasi qanday bo‘ladi?
4. Turli ishorali butun sonlarni ayirish uchun nima qilish kerak?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar butun sonlar ustida topshiriqlar bajarishda ko‘pincha amal ishoralarini adashtiradi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda misol sifatida –6 bilan 6 ning o‘rtasida 11 ta son bo‘lishini, xatolari shunchalik katta ekanini qayta-qayta ta’kidlashi lozim. Ko‘rgazmali tarqatmalar berilsa va taqdimotlar qilinsa, maqsadga muvofiq bo‘ladi.

➢ *Uyga vazifa*

11-, 15-misollar (118-bet)

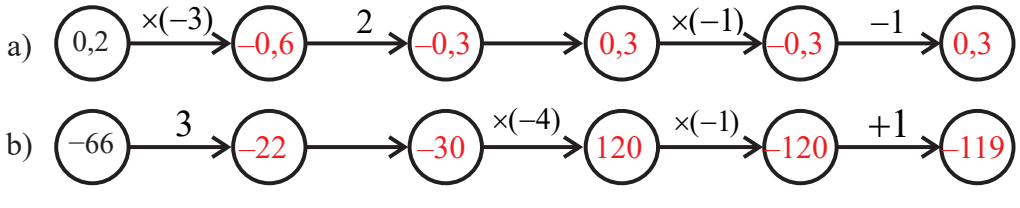
➢ *Mashqlar, ularning javoblari va yechimlari*

1. Noma’lumlarni toping.

a) $-15 \times 4 = -60$ b) $-72 \div (-12) = 6$ c) $49 \div (-7) = -7$

d) $-48 \div 6 = -8$ e) $-16 \times (-4) = -64$ f) $-11 \times (-8) = 88$

2. Ketma-ketlik asosida ifoda tuzing va hisoblang.



3. Zafarning uyi ko‘chaning o‘rtasida joylashgan va ko‘cha boshidan sanaganda 11-uy hisoblanadi. Zulayxoning uyi esa ko‘chaning oxiridan sanaganda 6-uy. Ko‘chaning boshidan sanasak, Zulayxoning uyi nechanchi uyga to‘g‘ri keladi?

Yechish. Zafarning uyi o‘rtada, uning uy raqami 11 ekan, demak, chap va o‘ng tomonida

10 tadan uy bor. Ularning ko‘chasidagi uylar soni 21 ta ekan. Zulayxoning uyi oxiridan 6-xonadon bo‘lsa, boshidan hisoblansa 16-xonadon bo‘ladi.

4. Bo‘sh kataklarni to‘ldiring.

a)

–5	+	2	=	–3
+		+		
–3	+	–1	=	–4
=		=		
–8		1		

b)

5	–	–3	=	8
+		–		
–6	+	–2	=	–8
=		=		
–1		–1		

c)

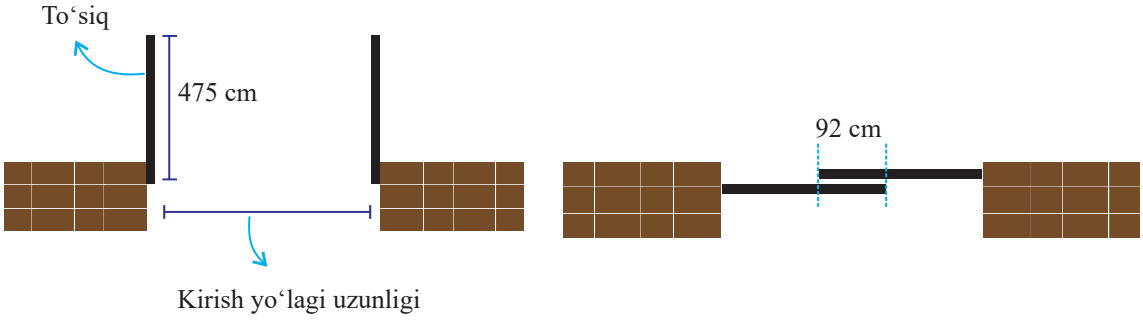
–4	+	–3	=	–7
–		+		
–4	–	–3	=	–1
=		=		
0		–6		

5. Sport maydonchasida o‘ynash uchun bitta mahalladan 13 nafar, ikkinchisidan 19 nafar bola to‘plandi. Keyin yana bir nechta bola uchinchi mahalladan qo‘shilgach, ular teng 6 ta jamoaga bo‘linib, o‘yin boshladi. Uchinchi mahalladan eng kamida nechta bola o‘yinga qo‘shilgan bo‘lishi mumkin?

Yechish. Jami uchta mahalladan $13 + 19 + x$ ta o‘yinchi to‘plandi. x uchinchi mahalladan kelgan bolalar sonini shunday tanlaymizki, yig‘indi 6 ga bo‘linadigan bo‘lsin. $32 + x$ da $x = 4$ bo‘lsa, $32 + 4 = 36$ soni 6 ga bo‘linuvchi sondir. Demak, uchinchi mahalladan $x = 4; 10; 16;$ … nafar bola kelgan.

6. Maktabga kirish darvozasi teng uzunlikdagi ikkita to‘siq bilan yopilishi mumkin. Har bir to‘siqning uzunligi 475 cm. To‘siqlar yopilganda bir-birining ustiga chiqadigan qismlarning uzunligi 92 cm. Maktabning kirish eshigi uzunligi necha santimetrga teng?

Yechish: 1) 475 cm + 475 cm = 950 cm; 2) 950 cm – 92 cm = 858 cm. **Javob:** 858 cm

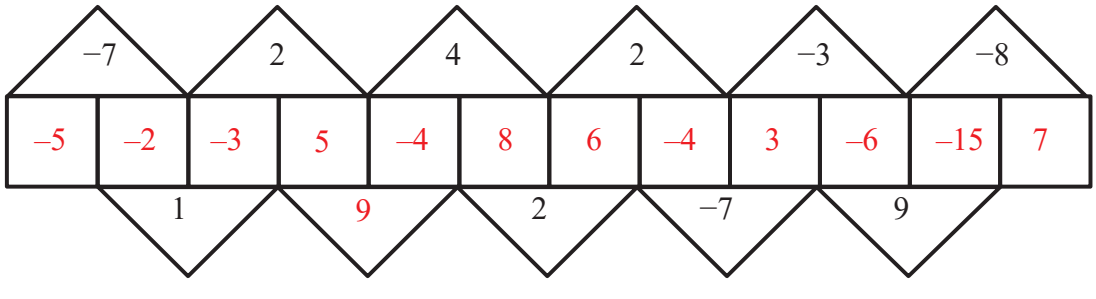


7. Qonuniyatni aniqlab, bo‘sh kataklarni to‘ldiring.

Yechish. Chap va o‘ng kataklarni qo‘shib, yig‘indisini tepadagi uchburchakka yozasiz. Masalan, $(–5) + (–2) = –7$ kabi.

Chap katakdagi butun sondan o‘ng katakdagi butun sonni ayirib, ayirmasini pastdagi uchburchakka yozasiz.

Masalan, $(–2) – (–3) = 1$.



10. Laylo opa 5 ta farzandining har biri uchun teng miqdorda shirinlik tayyorladi. Lekin kenjatoy farzandi uni yeyishni xohlamadi, shuning uchun Laylo opa shirinlikning bittasini o‘zi yedi va qolganlarini boshqa farzandlariga teng taqsimlab berdi. Agar pishiriqlar soni 10 tadan ko‘p va 40 tadan kam ekani ma’lum bo‘lsa, jami nechta pishiriq pishirilganini toping.

Yechish. Laylo opa 5 farzandiga teng miqdorda shirinlik pishirgan. U tayyorlagan shirinliklari miqdori 10 dan ortiq va 40 tadan kam. U farzandlari uchun 15; 20; 25; 30; 35 ta shirinlik tayyorlagan bo‘lishi mumkin.

Agar u 15 ta shirinlik tayyorlagan bo‘lsa, har bir bola 3 tadan shirinlik oladi. Kichik farzand rad etdi, uning bitta shirinligini onasi yedi va qolgan 2 ta shirinlik 4 ta farzandga teng bo‘linishi kerak edi. Lekin 2 soni 4 ga bo‘linmaydi.

Agar u 20 ta shirinlik tayyorlagan bo‘lsa, har bir bola 4 tadan shirinlik oladi. Kichik farzand rad etdi, uning bitta shirinligini onasi yedi va qolgan 3 ta shirinlikni 4 ta farzandiga teng bo‘linishi kerak edi. Lekin 3 soni 4 ga bo‘linmaydi.

Agar u 25 ta shirinlik tayyorlagan bo‘lsa, har bir bola 5 tadan shirinlik oladi. Kichik farzand rad etdi, uning bitta shirinligini onasi yedi va qolgan 4 ta shirinlik 4 ta farzandga teng bo‘linishi kerak edi. 4 soni 4 ga bo‘linadi.

Demak, ona 25 ta shirinlik tayyorlagan.

Agar shirinliklar 30 ta, 35 ta bo‘lsa, onasi yeganidan qolgan shirinliklarni 4 ta farzandi o‘rtasida teng taqsimlay olmaydi.

12. Savollarga javob yozing.

a) Payshanba kuni havo harorati −7 °C edi, ertasi kuni 9 °C ko‘tarildi. Ertasi kuni harorat qanday bo‘ldi?

b) Toshkentda havo harorati −5 °C, Urganchda −8 °C. Haroratlar o‘rtasidagi farq nechaga teng?

c) 2 °C harorat −2 °C haroratdan qancha ko‘p?

d) Yakshanba kuni havo harorati 4 °C edi, ertasi kuni 11 °C ga pasaydi. Ertasi kuni havo harorati qanday bo‘ldi?

Yechish:

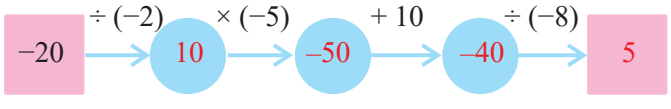
a) juma kuni havo harorati (–7) + (+9) = +2 °C bo‘ldi;

b) haroratlar orasidagi farq (–5) – (–8) = +3 °C bo‘ldi;

c) +2 °C harorat –2 °C haroratdan +4 °C ga ko‘p;

d) dushanba kuni havo harorati 4 °C dan 11 °C ga pasaysa –7 °C bo‘ladi.

13. Yashirilgan natijalarni toping.



14. Butun sonlarni o‘sish tartibida yozing.

Yechish.

a) –23; –9; –7; +3; +6.

b) –37; –35; –28; +31; +33.

c) –19; –15; –13; 0; +8; +11.

d) –19; –17; –15; 0; +14; +16.

15. Yozing.

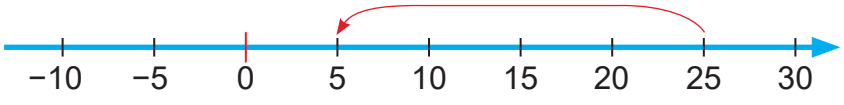
a) −5 dan katta, lekin 0 dan kichik 4 ta son;

b) −6 dan katta, lekin 1 dan kichik 5 ta son;

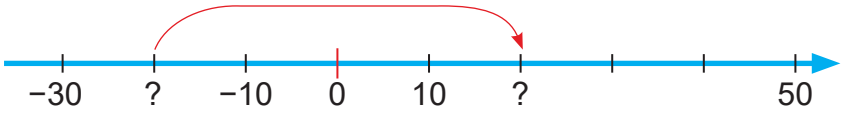
Yechish: a) 4 ta –5 dan katta, lekin 0 dan kichik bo‘lgan sonlar: –4; –3; –2; –1.

b) –6 dan katta, lekin 1 dan kichik bo‘lgan sonlar: –5; –4; –3; –2; –1.

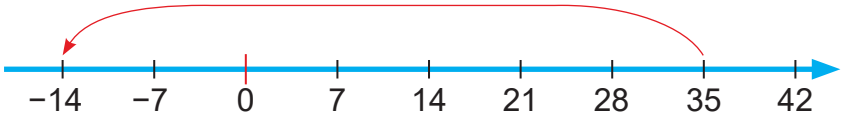
16. Sonlar o‘qiga mos ifodalar tuzing va hisoblang.



25 – 20 = 5



–20 + (+40) = 20



35 – 49 = –14

Summativ baholash. 4-nazorat ishi

1-variant

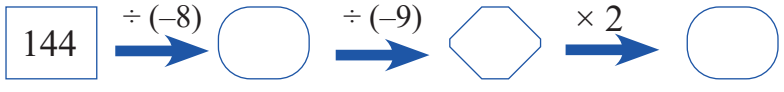
1. Son o‘qida A(–7) va B(4) nuqtalarni belgilang. Moduldan foydalanib A va B nuqtalar orasidagi masofani hisoblash uchun ifoda tuzib, nuqtalar orasidagi masofani toping.

2. Ifodaning qiymatini toping.

$\left(|x|+|-32|\right)-\left(|y|-|19|\right)$, bu yerda $x=-42;\ y=-29$.

3. –3 sonidan 5 birlik kichik songa –6 dan 17 birlik katta sonni qo‘shing. Yig‘indini –5 ga ko‘paytiring.

4. Amallarni ko‘rsatilgan yo‘nalish bo‘yicha hisoblang:



5. Amallarni bajaring: $(5\times4+24\div(-8))\div(-17)-|-36|\div|-9|=?$

2-variant

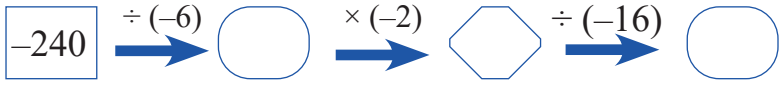
1. Son o‘qida M(–5) va N(6) nuqtalarni belgilang. Moduldan foydalanib M va N nuqtalar orasidagi masofani hisoblash uchun ifoda tuzib, nuqtalar orasidagi masofani toping.

2. Ifodaning qiymatini toping.

$\left(|-24|+|a|\right)-\left(|b|-|-42|\right)$, bu yerda $a=-18;\ b=-56$.

3. – 6 sonidan 14 birlik katta songa, 3 sonidan 9 birlik kichik sonni qo‘shing. Yig‘indini –4 ga ko‘paytiring.

4. Amallarni ko‘rsatilgan yo‘nalish bo‘yicha hisoblang:



5. Amallarni bajaring: $(-8\times(-3)+39\div(-3))\div(-11)-|-65|\div|-13|=?$

V BOB. RATSIONAL SONLAR

Ratsional sonlar haqida tushuncha

Barcha o‘quvchilar	Ratsional sonlar haqida tushunchaga ega.
Aksariyat o‘quvchilar	a) 0,7; 1,41; −11,01; −5,00023; 0,(3); −0,(9) sonlarini oddiy kasr ko‘rinishida yozishni biladi.
Ba’zi o‘quvchilar	Ratsional sonlarni oddiy kasr va sonlarni maxraji natural son bo‘lgan oddiy kasr ko‘rinishida yoza oladi, unga doir tenglamalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Qanday sonlar “natural sonlar” deyiladi?
2. Qanday sonlar “butun sonlar” deyiladi?
3. “Ratsional sonlar” deb qanday sonlarga aytiladi?
4. Butun son bilan natural sonning farqi nimada?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar ratsional sonlar, butun sonlar, natural kasrlarni ba’zan ajrata olmaydi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shuni qayta-qayta aytishi, mavzuga doir savollar, tarqatmalar tayyorlashi kerak.

➢ *Uyga vazifa*

14-, 15-, 16-misollar (122-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Natijalarni tahlil qiling va xulosangizni bildiring.

Yechish. Berilgan misolda surati p ga va maxraji q ga teng bo‘lgan kasrni hosil qilish ko‘rsatilgan. Berilgan sonlarni surat va maxrajga qo‘yib, kasrni, unga teng qiymatni hosil qilamiz.

p	q	$\frac{p}{q}$	=	
1	1	$\frac{1}{1}$	1	Agar kasrning surat va maxraji teng bo‘lsa, uning qiymati 1 ga teng bo‘ladi.

– 55	100	$\frac{-55}{100}$	– 0,55	Surat manfiy, maxraj musbat bo‘lsa, natija manfiy ratsional son bo‘ladi.
1	1000	$\frac{1}{1000}$	0,001	Surati va maxraji musbat bo‘lsa, natija musbat ratsional son bo‘ladi.
– 253	10	$\frac{-253}{10}$	– 25,3	Surat manfiy, maxraj musbat bo‘lsa, natija manfiy ratsional son bo‘ladi.
7	0	$\frac{7}{0}$	Yo‘q! q – 0 bo‘lishi mumkin emas!	Ratsional sonning maxraji 0 bo‘lishi mumkin emas.

2. Sonlarni oddiy kasr ko‘rinishida yozing.

Yechish: butun sonlarni kasr songa aylantiramiz:

a) $2=\frac{2}{1}=\frac{4}{2}=\frac{-6}{-3}=....$ $5=\frac{5}{1}=\frac{15}{3}=\frac{-20}{-4}=....$ $-1=\frac{-1}{1}=\frac{1}{-1}=\frac{-17}{17}=....$

O‘nli kasrlarni kasr songa aylantiramiz:

b) $0,7=\frac{7}{10}$ $1,41=1\frac{41}{100}=\frac{141}{100}$ $-11,01=-11\frac{1}{100}=-\frac{1101}{100}$ $-5,00023=-5\frac{23}{100000}$

Davriy kasrlarni kasr songa aylantiramiz:

c) $0,(3)=\frac{3}{9}=\frac{1}{3}$ $-0,(9)=-1$ $2,(411)=2\frac{137}{333}$ $-14,(42)=-14\frac{14}{33}$

3. Sonlarni maxraji natural son bo‘lgan oddiy kasr ko‘rinishida yozing.

Yechish. Bunda kasr chizig‘i_bo‘lish amali vazifasini bajarishini hisobga olamiz.

$\frac{1}{-5}=\frac{-1}{5}$ $\frac{-7}{-8}=\frac{7}{8}$ $\frac{5}{11}=\frac{-5}{11}$ $\frac{15}{-19}=\frac{-15}{19}$ $\frac{-2}{-13}=\frac{2}{13}$

4. Sonlarning qaysilari natural son bo‘la oladi? Ajratib yozing.

Yechish. Kasr chizig‘i bo‘lish amali sifatida olinsin.

$\frac{7}{3}=2\frac{1}{3}$ natural son emas. $\frac{8}{4}=2$ natural son $\frac{-16}{2}=-8$ butun son

$\frac{72}{10}=7,2$ natural son emas $\frac{-150}{-5}=30$ natural son $\frac{9}{10}=0,9$ natural son emas

5. Ratsional sonlarni oddiy kasr ko‘rinishida yozing.

$-1=\frac{-5}{5}=\frac{7}{-7}=\ldots$ $\quad 7=\frac{7}{1}=\frac{14}{2}=\ldots$ $\quad 0=\frac{0}{N}$ $\quad -88=\frac{-176}{2}=\ldots$

$-1\frac{5}{6}=-\frac{11}{6}$ $\quad -2\frac{1}{2}=-\frac{3}{2}$ $\quad 0,42=\frac{42}{100}$ $\quad -171,01=-\frac{17101}{100}$

8. Jadvalda berilgan mahsulotlardagi temir moddasini grammda ifodalang.

Yechish: 100 gr mahsulotning tarkibida qancha temir moddasi borligini topamiz.

Mahsulotlar (100 g)	Temir moddasi (mg)	Ratsional son (g)
Dukkakli mahsulotlar	6	$\frac{6}{100\,000}$
Jigar go‘shti	7	$\frac{7}{100\,000}$
Ismaloq	13,5	$\frac{135}{1\,000\,000}$

9. x o‘rniga shunday son qo‘yingki, natijada to‘g‘ri tenglik hosil bo‘lsin.

Yechish. Bunda kasrlarni qisqartirish qoidasi va kasrning asosiy xossasidan foydalanamiz.

a) $\frac{-7}{14}=\frac{1}{x}$; $x=-2$ $\quad$ b) $x=1$ $\quad$ c) $x=-1$ $\quad$ d) $x=-16$.

10. Qisqartiring va musbat maxrajli kasr ko‘rinishida yozing.

a) $\frac{-8}{10}=\frac{-4}{5}$ $\quad$ b) $\frac{-12}{-24}=\frac{1}{2}$ $\quad$ c) $\frac{6}{-18}=\frac{-1}{3}$

d) $\frac{-25}{-45}=\frac{5}{9}$ $\quad$ e) $\frac{-12}{16}=\frac{-3}{4}$

11. Taqqoslang.

a) $\frac{25}{37}<\frac{47}{74}$ $\quad$ b) $\frac{-7}{16}>\frac{-5}{16}$ $\quad$ c) $\frac{-5}{6}<0$ $\quad$ d) $\frac{7}{-8}>\frac{-8}{7}$

12. Hisoblang va natijani $\frac{p}{q}$ ko‘rinishida yozing (p – butun son, q – natural son).

a) $1-\frac{1}{2}=\frac{2}{2}-\frac{1}{2}=\frac{1}{2}$ $\quad$ b) $\frac{1}{6}$ $\quad$ c) $3\frac{3}{7}$ $\quad$ d) 9,9

13. Hisoblang.

a) $1-\frac{19}{33}$ b) $2-\frac{77}{97}$ c) $19-18\frac{23}{24}$ d) $2021-\frac{2022}{2023}$

Yechish. Butun son bilan kasr son, butun son bilan aralash son ustida amallarni bajarish qoidasiga ko‘ra hisoblanadi.

a) $1-\frac{19}{33}=\frac{33}{33}-\frac{19}{33}=\frac{33-19}{33}=\frac{14}{33}$ b) $1\frac{20}{97}$ c) $\frac{1}{24}$ d) $2020\frac{1}{2023}$

14. Ratsional son ko‘rinishida yozing va taqqoslang.

a) $25>4{,}7$ b) $-79>-81$ c) $-5<0$ d) $78>-50$

$\frac{25}{1}>4\frac{7}{10}$ $-\frac{79}{1}>-\frac{81}{1}$ $-\frac{5}{1}<0$ $\frac{78}{1}>-\frac{50}{1}$

15. Amallarni bajaring va natijani $\frac{p}{q}$ ko‘rinishida yozing.

a) $1-\frac{1}{12}=\frac{11}{12}$ b) $-\frac{1}{12}+\frac{2}{3}=\frac{7}{12}$ c) $-5\frac{4}{7}+\left(-4\frac{1}{14}\right)=\frac{3}{2}$ d) $-4{,}17+5{,}53=\frac{34}{25}$

16. Hisoblang.

a) $2-1\frac{19}{319}$ b) $7-2\frac{77}{97}$ c) $39-29\frac{23}{124}$ d) $2023-2\frac{2023}{2024}$

Yechish: a) $2-1\frac{19}{319}=1\frac{319}{319}-1\frac{19}{319}=\frac{319-19}{319}=\frac{300}{319}$

b) $5\frac{20}{97}$ c) $10\frac{101}{124}$ d) $2020\frac{1}{2023}$

Ratsional sonlarni qo‘shish

Barcha o‘quvchilar	$\frac{5}{9}+\left(-\frac{7}{9}\right)$; 12,101 + (− 2,1) ko‘rinishidagi misollarni bajara oladi.
Aksariyat o‘quvchilar	$\frac{5}{7}+\left(-\frac{7}{13}\right)$; $\frac{4}{5}+\left(-\frac{2}{15}\right)$ ko‘rinishidagi misollarni bajara oladi.
Ba’zi o‘quvchilar	$\left(-\frac{7}{8}+\frac{9}{11}+\frac{15}{17}\right)+\left(\frac{7}{8}+\frac{2}{11}+\frac{2}{17}\right)$ ko‘rinishdagi ratsional sonlarni qo‘shishga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Qanday sonlar “natural sonlar” deyiladi?
2. Qanday sonlar “butun sonlar” deyiladi?
3. “Ratsional sonlar” deb qanday sonlarga aytiladi?
4. Butun son bilan natural sonning qanday farqi bor?
5. Musbat son ratsional son bo‘ladimi?
6. Manfiy son-chi?
7. Ratsional son manfiy son bo‘la oladimi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar ratsional sonlar, butun sonlar, natural kasrlarni ba’zan ajrata olmaydi. Bu holatning oldini olish uchun o‘qituvchi mavzuga doir savollar, tarqatmalar tayyorlashi kerak.

➢ *Uyga vazifa*

11-, 13-, 15-misollar (125-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Hisoblang, bo‘sh kataklarni to‘ldiring.

a) Kasrlarni qo‘shish hamda butun sonlarni qo‘shish qoidasini qo‘llab hisoblanadi.

b) $\frac{11}{19}+\left(\frac{-3}{19}\right)=\frac{11+(-3)}{19}=\frac{8}{19}$

c) $14,7+5,27=\frac{147}{10}+\frac{527}{100}=\frac{1470}{100}+\frac{527}{100}=\frac{1470+527}{100}=\frac{1997}{100}=19\frac{97}{100}=19,97$

2. Toping.

Yechish. Qo‘shish orqali topshiriqni bajaramiz.

a) $-\frac{4}{5}+\frac{4}{5}=0$ izlayotgan sonimiz 0 soni ekan.

b) $\frac{2}{3}+\frac{1}{3}=1$ izlayotgan sonimiz 1 soni ekan.

3. Hisoblang.

Yechish. Amallarni berilgan misolnng shaklini o‘zgartirgan holda qulay usul bilan bajaramiz.

a) $\left(\frac{7}{8}+\frac{9}{11}+\frac{15}{17}\right)+\left(\frac{1}{8}+\frac{2}{11}+\frac{2}{17}\right)=\left(\frac{7}{8}+\frac{1}{8}\right)+\left(\frac{9}{11}+\frac{2}{11}\right)+\left(\frac{15}{17}+\frac{2}{17}\right)=1+1+1=3$

b) 15.

4. 1-kuni ishning $\frac{3}{8}$ qismi, 2-kuni esa $\frac{1}{6}$ qismi bajarildi. Shu ikki kunda ishning qancha qismi bajarilgan?

Yechish. Bajarilgan ishni ifoda etuvchi kasrlarni bir xil maxrajga keltiramiz. Birinchi kuni $\frac{3}{8}=\frac{9}{24}$ qismini, ikkinchi kuni $\frac{1}{6}=\frac{4}{24}$ qismini bajargan bo‘lsa, shu ikki kunda u ishning $\frac{9}{24}+\frac{4}{24}=\frac{13}{24}$ qismini bajargan.

5. Hisoblang.

a) $\frac{5}{9}+\left(-\frac{7}{9}\right)=\frac{5}{9}+\frac{-7}{9}=\frac{5+(-7)}{9}=\frac{-2}{9}=-\frac{2}{9}$ b) $-\frac{5}{19}$ c) -1 d) $\frac{27}{37}$.

8. Jadvalda 1950- va 2021-yillardagi dunyo aholisi soni ko‘rsatilgan.

a) Yetishmayotgan qiymatlarni yozing.

b) 1950-yildan 2021-yilgacha dunyo aholisi necha millionga oshgan?

Yechish. Jadvaldagi ma’lumotlar orqali savollarga javob beramiz.

a) yetishmayotgan qiymatlarni ustun bo‘yicha yig‘indisi “Dunyo bo‘yicha” satriga mos kelishi kerak.

b) 1950-yildan 1990-yilgacha dunyo aholisi necha mln kishiga ortganini topish har bir satrda “uchinchi” ustundagi sondan “ikkinchi” ustundagi sonni ayirib, “to‘rtinchi” ustunga yozish orqali bajariladi.

Dunyo hududlari	1950-yildagi aholi (mln)	2021-yildagi aholi (mln)	Farqi (mln)
Afrika	222	642	420
Osiyo	1 558	3 402	1 844
Yevropa	393	498	105
Janubiy Amerika	166	448	282
Shimoliy Amerika	166	276	110
Okeaniya	13	26	13
Dunyo bo‘yicha	2 518	5 292	2 774

9. Kunduzi havo harorati +3 °C bo‘ldi. Kechqurun:

a) 2 °C ga sovidi; b) 5 °C ga sovidi; c) 3 °C ga issiqroq bo‘ldi;

Yechish. Kunduzi havo harorati +3 °C ni ko‘rsatayotgan bo‘lsa:

a) +3 °C + (–2 °C) = 1 °C, agar 2 °C ga havo harorati pastlasa, +1 °C ni ko‘rsatadi.

b) –2 °C; c) 6 °C.

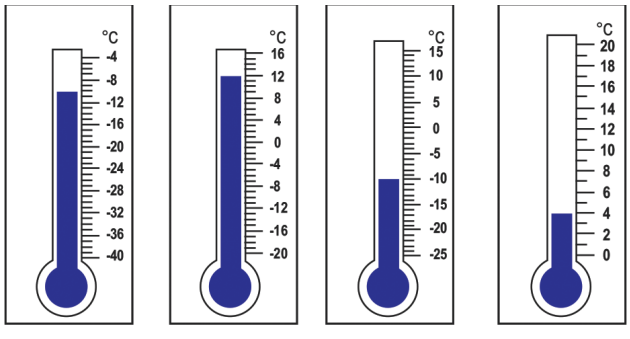
10. Barcha harorat a) 12 °C ga; b) 8 °C ga ko‘tarilsa, ko‘rsatkichlar qanday o‘zgaradi?

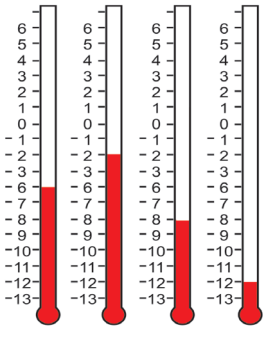
a) 12 °C ga ko‘tarilsa:
– 6 °C + 12 °C = + 6 °C
– 8 °C + 12 °C = + 4 °C

b) 8 °C ga ko‘tarilsa:
– 6 °C + 8 °C = + 2 °C
– 8 °C + 8 °C = 0 °C

a) – 2 °C + 12 °C = + 10 °C
– 12 °C + 12 °C = 0 °C

b) – 2 °C + 8 °C = + 6 °C
– 12 °C + 8 °C = – 4 °C



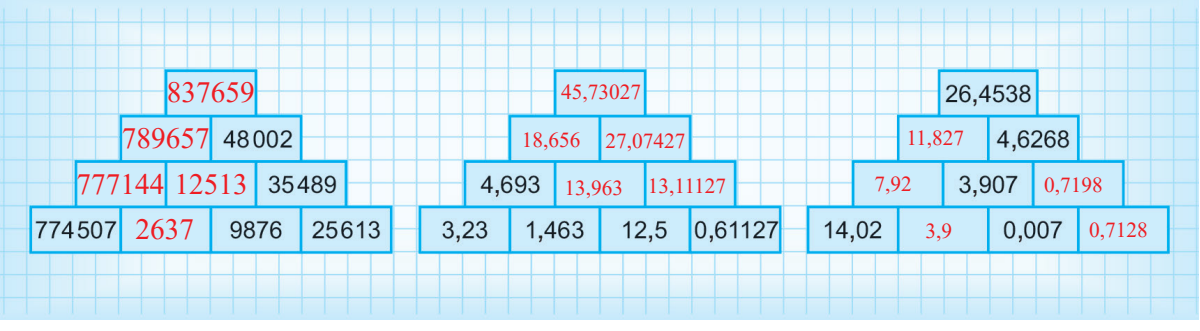


15. Uchburchakning bir tomoni 3,1 m, ikkinchi tomoni 2,89 m va uchinchi tomoni 3,01 m bo‘lsa, uning perimetrini toping.

Yechish: uchburchakning perimeti uning barcha tomonlari yig‘indisidir: $p = a + b + c$.

$a = 3{,}1$ m; $b = 2{,}89$ m; $c = 3{,}01$ m ga eng. $p = 3{,}1 + 2{,}89 + 3{,}01 = 5{,}99$ m.

16. Bo‘sh kataklarni to‘ldiring.



Ratsional sonlarni ayirish

Barcha o‘quvchilar	$\frac{5}{9}-\left(-\frac{7}{9}\right)$ ko‘rinishdagi misollarni yecha oladi.
Aksariyat o‘quvchilar	$\frac{-4}{5}-\left(-\frac{2}{15}\right)$; $5-\frac{4}{9}$ kabi misollarni yecha oladi
Ba’zi o‘quvchilar	Ratsional sonlarni ayirishga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Butun son bilan natural sonning farqi nimada?
2. Musbat son ratsional son bo‘ladimi?
3. Manfiy son-chi?
4. Ratsional son manfiy son bo‘la oladimi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar ko‘pincha ratsional sonlarni ayirishdagi ishoralarda, umumiy maxraj berishda, o‘nli kasrlarni ratsional sonlarga qo‘shishda qiynaladilar. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta aytishi, mavzuga doir savollar, tarqatmalar tayyorlashi kerak.

➢ *Uyga vazifa*

8-, 9-, 10-misollar (127-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Hisoblang, bo‘sh kataklarni to‘ldiring.

a) $\frac{-2}{15}-\frac{(-7)}{15}=\frac{-2+7}{15}=\frac{5}{15}=\frac{1}{3}$

b) $\frac{-5}{16}-\frac{1}{16}=\frac{-5+(-1)}{16}=\frac{-6}{16}=\frac{-3}{8}$

c) $\frac{17}{36}-\frac{(-11)}{9}=\frac{17}{36}+\frac{-11\times 4}{9\times 4}=\frac{17+(-44)}{36}=\frac{-27}{36}=-\frac{3}{4}$

d) $\frac{-5}{14}-\frac{(-4)}{35}=\frac{-5\times 5}{14\times 5}-\frac{-4\times 2}{35\times 2}=\frac{-25}{70}-\frac{-8}{70}=\frac{-25+8}{70}=\frac{-17}{70}$

2. Toping.

a) $-\frac{4}{5}-\frac{4}{5}=\frac{-4-4}{5}=\frac{-8}{5}=-1\frac{3}{5}$

b) $\frac{2}{3}-\frac{1}{3}=\frac{2-1}{3}=\frac{1}{3}$

c) $1{,}8-3{,}4=-1{,}6$

d) $-4{,}7-5{,}1=-9{,}8$

3. Chelakka suv quyilganidan keyin uning massasi 6,25 kg ga teng bo‘ldi. Agar bo‘sh chelak 1,75 kg bo‘lsa, unga quyilgan suv massasini aniqlang.

Yechish: chelak + suv = 6,25 kg hamda chelak = 1,75 kg bo‘lsa, unga solingan suvning massasi suv = 6,25 – 1,75 ayirmani hisoblash orqali topiladi. Demak, suv = 4,5 kg.

4. Hisoblang.

Yechish. Hisoblashlarni kasrlarni va butun sonlarni ayirish qoidalari qo‘llab bajaramiz.

a) $3\frac{1}{3}-3\frac{2}{3}=(3-3)+\left(\frac{1}{3}-\frac{2}{3}\right)=0+\left(-\frac{1}{3}\right)=-\frac{1}{3}$

b) $\frac{1}{4}$ c) $1\frac{5}{21}$ d) $2\frac{4}{11}$ e) $1\frac{1}{2}$ f) $11\frac{7}{60}$ g) $-21\frac{9}{14}$ h) $3\frac{16}{21}$

5. Jadvalni to‘ldiring.

a	b	$a+b$	$a-b$	$\lvert a+b\rvert$	$\lvert a-b\rvert$	$\lvert a\rvert-\lvert b\rvert$	$\lvert b\rvert-\lvert a\rvert$
$-7\frac{7}{10}$	20						
18	−2,3						
−2,9	−47						
−3,4	7,5						
6,5	−4,9						

6. Men o‘ylagan sonimga 7,(3) ni qo‘shganimda 9,(23) hosil bo‘ldi. Ayting-chi, men qaysi sonni o‘yladim?

Yechish. Agar men o‘ylagan son n soni bo‘lsa, u holda masala shartidan quyidagi tenglamani tuzish mumkin: $n + 7,(3) = 9,(23)$. Tenglamani yechib, n ni topamiz.

$$n=9,(23)-7,(3)=9\frac{23}{99}-7\frac{3}{9}=9\frac{23}{99}-7\frac{33}{99}=8\frac{122}{99}-7\frac{33}{99}=1\frac{89}{99}=1,(89)$$

Men o‘ylagan son 1,(89) soni edi.

7. Ayirmani toping.

a) $-\frac{1}{2}-\frac{1}{3}=-\frac{3}{6}-\frac{2}{6}=\frac{-3-2}{6}=\frac{-5}{6}=-\frac{5}{6}$ b) $\frac{5}{72}$ c) $\frac{59}{70}$ d) $\frac{1}{6}$

8. Hisoblang.

a) $1-\frac{3}{4}=\frac{4}{4}-\frac{3}{4}=\frac{4-3}{4}=\frac{1}{4}$ b) $4\frac{3}{8}$ c) $7\frac{14}{23}$ d) $10\frac{19}{37}$

Ko‘rsatma: *butundan kasrni ayirish uchun butunni bir birlik kamaytirib, kasrning suratiga uning maxrajidan suratini ayirib, surat qilib yozish va maxrajning o‘zini yozish kifoya.*

Masalan: $7-\frac{11}{24}=(7-1)\frac{24-11}{24}=6\frac{13}{24}$

PISA topshirig‘i asosida bilimingizni sinab ko‘ring

1. Futbol bo‘yicha O‘zbekiston o‘smirlar jamoasi murabbiysi hujum chizig‘ini kuchaytirish maqsadida bir hujumchi va ikkita yarim himoyachini saralash asosida qabul qilish uchun ochiq tanlov e’lon qildi. Talab etilgan ko‘rsatkichlar asosida nomzodlar jadvali taqdim etildi.

Futbolchilarning ismi	Gollar soni	O‘yinlar soni	Assistlar soni (golli uzatma)
Eldor	25	30	12
Jasur	19	22	6
Jaloliddin	23	23	11
Ibrohim	21	28	10
Otabek	24	27	12
Aziz	26	35	13
Igor	25	28	11

Izoh: *hujumchi o‘yinga nisbatan gollar soniga qarab tanlanadi. Yarim himoyachi esa assistlar (golli uzatmalar) soniga qarab tanlanadi.*

Savol. Murabbiy hujumchi va yarim himoyachi sifatida kimlarni tanlaydi?

2. Shahar sharoitida harakatlanishning eng qulay vositasi sifatida avtobusdan foydalaniladi. Samarqand shahridagi 64-avtobus bitta reys davomida 50 ta bekatda to‘xtab, 24,84 km masofani bosib o‘tadi. Avtobusning bir o‘rtacha qatnov vaqti (borib-kelishi) 70 minut bo‘lib, u har bekatda o‘rtacha 0,5 minut to‘xtashishi mumkin.



1-savol. Yo‘nalish davomida avtobus o‘rtacha qanday tezlik bilan harakatlanadi?

2-savol. Agar shaharda 12 ta 64-sonli avtobus harakati yo‘lga qo‘yilgan bo‘lsa, taqriban (javobni yaxlitlang) har necha minutda keyingi avtobus keladi?

LOYIHA ISHI

Avtokredit

O‘zbekiston banklaridan ixtiyoriy 3 tasini tanlang. Bu uchun internetdagi ma’lumotlardan foydalaning. Tanlangan 3 ta bankning kredit siyosatini o‘rganing. Faqat avtokreditni o‘rgansangiz yetarli.

Banklar sizga kredit foizlarini turlicha taklif qiladi. Bank tomonidan berilgan foiz stavkasi qancha past bo‘lsa, kredit olganingizda shuncha yaxshi jamg‘arma olishingiz mumkin. Ba’zi banklar ko‘p foyda olish uchun yuqori foiz stavkasini taklif qiladi va iqtisodiy omillar tufayli foizlarni oldindan ogohlantirmasdan o‘zgartiradi.

Topshiriq

Otangiz mashina olish uchun bankdan 60 mln so‘m qarz olmoqchi. Agar otangiz 1 yil, 2 yil, 3 yil va 4 yilga bo‘lib-bo‘lib to‘lashni tanlasa, kamida ikkita usuldan foydalanib mashina uchun to‘lanadigan qiymatlarni toping. Ishingizni aniq ko‘rsating va natijalaringizni jadvalda ifodalang. Siz 3 ta bankning kredit takliflari hisob-kitobini amalga oshirishingiz kerak. Otangizga qaysi bankni tavsiya qilasiz?

_____ BANK			
Davomiyligi	Yillik foiz stavka	Yillik foiz summasi	Jami qaytariladigan summa
1 yil (12 oy)			
2 yil (24 oy)			
3 yil (36 oy)			
4 yil (48 oy)			

Qo‘shimcha ma’lumotlar olish uchun:

1. https://cbu.uz/oz/
2. https://cbu.uz/oz/credit-organizations/banks/
3. https://bank.uz/credits

Summativ baholash. 5-nazorat ishi

1-variant

1. Amallarni bajaring: $\left(3\frac{3}{17}+\left(-2\frac{2}{19}\right)\right)+\left(-1\frac{17}{19}+2\frac{14}{17}\right)+(-5)=?$

2. 72 sonidan avval $36\frac{3}{8}$ ni ayiring va hosil bo‘lgan sondan $13\frac{10}{16}$ ni ayiring. Natijani toping.

3. Ko‘paytiring: $-\frac{25}{14}\times\frac{27}{35}\times\left(-\frac{49}{45}\right)\times\left(-\frac{2}{3}\right)=?$

4. Bo‘lishni bajaring: $\left(16,8\div\frac{21}{500}\right)\div\left(-\frac{2}{5}\right)=?$

5. Qulay usul bilan hisoblang: $-2,4\times\frac{2}{5}+\frac{2}{5}\times(-7,6)+6\frac{1}{2}\div(-2,6)=?$

2-variant

1. Amallarni bajaring: $\left(4\frac{7}{13}+\left(-3\frac{7}{9}\right)\right)+\left(-4\frac{2}{9}+5\frac{6}{13}\right)+(-2)=?$

2. 76 sonidan avval $27\frac{5}{6}$ ni ayiring va hosil bo‘lgan sondan $22\frac{4}{24}$ ni ayiring. Natijani toping.

3. Ko‘paytiring: $\frac{22}{27}\times\left(-\frac{18}{11}\right)\times\left(-\frac{15}{12}\right)\times\left(-\frac{3}{5}\right)=?$

4. Bo‘lishni bajaring: $\left(11,8\div\left(-\frac{59}{300}\right)\right)\div\left(-\frac{60}{7}\right)=?$

5. Qulay usul bilan hisoblang: $-3,8\times\frac{5}{9}+(-5,2)\times\frac{5}{9}+2\frac{4}{5}\div\left(-\frac{2}{5}\right)=?$

VI BOB. GEOMETRIYA VA O‘LCHASHLAR

Dekart koordinatalar sistemasi

Barcha o‘quvchilar	Dekart koordinatalar sistemasi haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Koordinatalar sistemasida (x; y) nuqtani belgilay oladi.
Ba’zi o‘quvchilar	Har qanday koordinatalar sistemasini belgilay oladi, unga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Dekart koordinatasi nima uchun kerak? Hayotiy misollar keltiring.

2. Dekart koordinatasida x ning manfiy nuqtalari qaysi choraklarda belgilanadi?

3. x, y o‘qlarning musbat nuqtalari dekart koordinata tekislining qaysi choragida joylashadi?

4. Agar x musbat, y manfiy bo‘lsa-chi?

5. Agar x manfiy, y musbat bo‘lsa-chi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda koordinatalar sistemasida x va y o‘qlarni topishda ishoralarda, ketmaket belgilashda qiynaladilar. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shunga doir savollar, tarqatmalardan foydalanishi kerak.

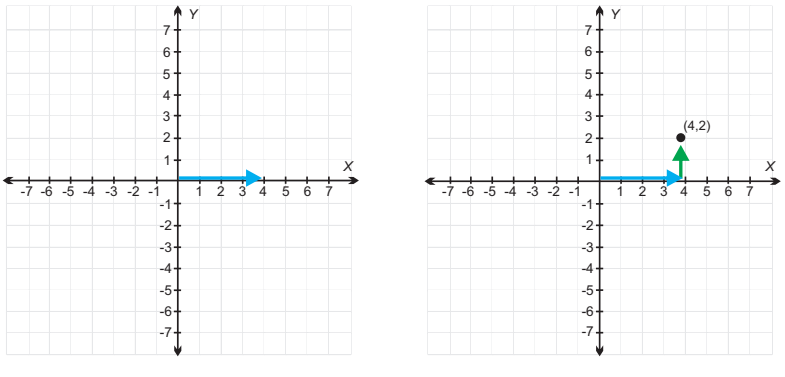
➢ *Uyga vazifa*

11-, 12-misollar (141-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

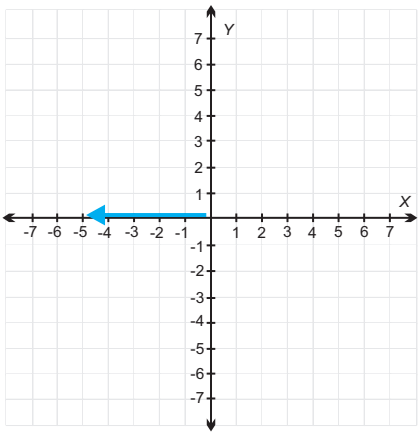
1. Koordinatalar sistemasida (4; 2) nuqtani belgilang.

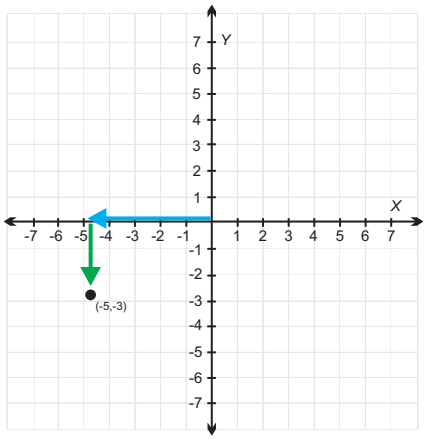
Bajarish. Dastlab koordinata boshini aniqlang. Berilgan (4; 2) nuqtaning x koordinatasi 4, y koordinatasi 2.



2. Dekart koordinatalar sistemasida (–5; –3) nuqtani belgilang.

Bajarish. Dastlab koordinata boshini aniqlang. Berilgan (–5; –3) nuqtaning x koordinatasi –5, koordinatasi –3.





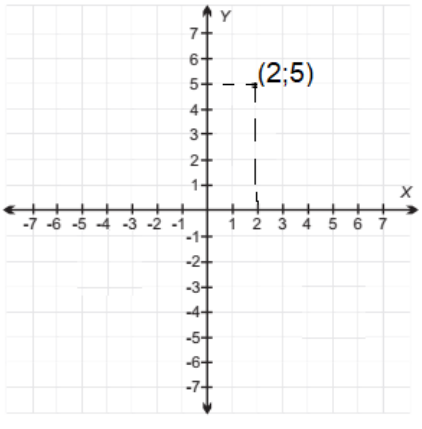
3. Dekart koordinatalar sistemasida berilgan nuqtalar o‘rnini belgilang.

a) (2; 5) nuqtani koordinatalar tekisligida ko‘rsatib qo‘yildi. Siz o‘quvchilar bilan qolgan nuqtalarning koordinatasini koordinatalar tekisligida aniqlang.

b) (4; 6) c) (–3; 5) d) (–4; –5) e) (3; –4)

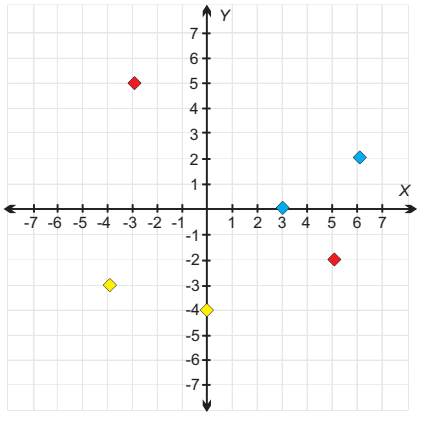
f(5; 0) g) (0; 4) h) (–7; 0) i) (0; –4)

l(0;0)



4. Ranglar bilan belgilangan nuqtalarning koordinatalarini aniqlang.

Yechish. I chorakdagi ko‘k nuqtaning koordinatalari (6; 2), Siz o‘quvchilar bilan birga qolgan nuqtalarning koordinatalarini toping.



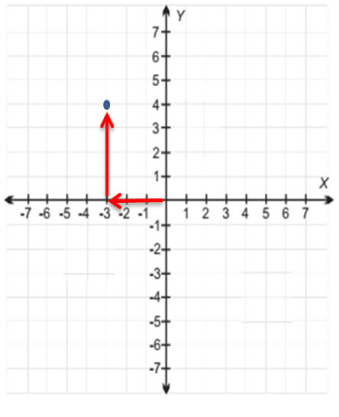
5. Koordinata sistemasida amaliy ish bajaring.

a) Koordinata boshidan chap tomonga uch birlik, yuqoriga to‘rt birlik yuring.

b) Koordinata boshidan o‘ng tomonga ikki birlik, yuqoriga besh birlik yuring.

c) Koordinata boshidan chap tomonga to‘rt birlik, pastga uch birlik yuring.

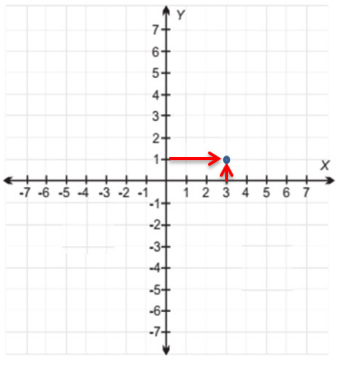
d) Koordinata boshidan o‘ng tomonga uch birlik, pastga ikki birlik yuring.



Yechish. a) koordinata boshidan chap tomonga uch birlik va yuqoriga to‘rt birlik yurish natijasida topilgan nuqta (–3; 4) nuqtadir.

Qolgan harakatlarni o‘quvchilar bilan birga rasmda ko‘rsatilganidek amalga oshirib, nuqtalarni aniqlang.

6. Berilgan shartlarga mos nuqtalarni Dekart koordinatalar sistemasida belgilang.



a) x o‘qdan bir birlik yuqorida va y o‘qdan uch birlik o‘ngda.

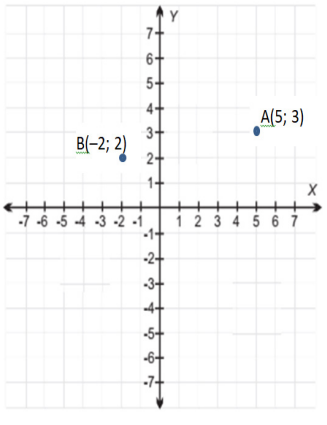
b) x o‘qdan uch birlik yuqorida va y o‘qdan besh birlik masofada.

c) x o‘qdan to‘rt birlik masofada va y o‘qdan ikki birlik masofada.

Javob: a) x o‘qdan bir birlik yuqorida va y o‘qdan uch birlik o‘ngda joylashgan nuqta (3; 1) nuqtadir.

Qolgan nuqtalarni o‘quvchilar bilan birga aniqlang.

7. Nuqtalarni koordinatalar sistemasida belgilang.



Yechish. A(5;3), B(–2; 2) nuqtalar koordinatalar sistemasida ko‘rsatildi, qolgan nuqtalar o‘quvchilar bilan birlagalikda topiladi.

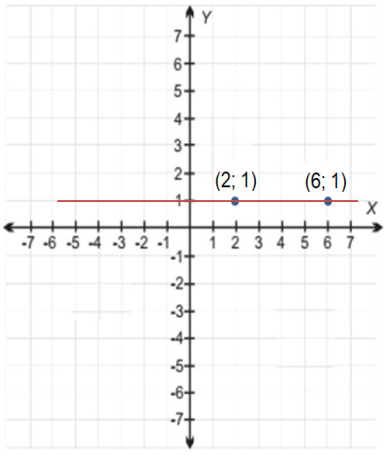
C(0; 3), D(1; –4), E(–2; –3), F(–5; 1), H(1; 5), I(4; 0),

J(–5; 0), K(–3; –4), L(–1; 4), M(1; –2), N(5; –2), O(2; 5).

8. Ikkinchi chorakda x va y o‘qdan bir xil uzoqlikda bo‘lgan to‘rtta nuqtani belgilang. *E’tibor bering: aniqlangan nuqtalar bir chiziqda joylashadi.*

Yechish. II chorakda x va y lari bir xil bo‘lgan nuqtalarni topamiz. Masalan A(–2; 2), B(–3; 3), C(–0,5; 0,5), D(–2,5; 2,5) va hokazo. Bu nuqtalarning joylashuvini o‘rgansangiz, ular bir to‘g‘ri chiziqda joylashadi.

9. Koordinatalar sistemasida (2; 1) va (6; 1) nuqtalarni belgilang. Ular orasidan barchasi bir to‘g‘ri chiziqda bo‘lgan nuqtalarning koordinatasini toping.



Yechish. Koordinatalar tekisligida (2; 1) va (6; 1) nuqtalar bir to‘g‘ri chiziqda joylashadi. Ular orasidagi nuqtalar: (3; 1); (4; 1), (5; 1).

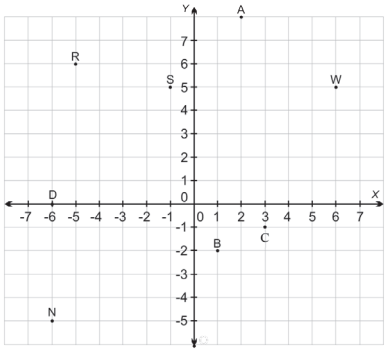
10. a) Chizmada ko‘rsatilgan nuqtalarning koordinatalarini yozing.

b) Koordinata sistemasida nuqtalarni belgilang.

F(–5; –2); G(3; 4); H(–3; 0); J(–5; 3); K (4; –4)

Yechish: a) A(2; 8), B(1; –2). Qolgan D, N, R, O, W nuqtalar o‘quvchilar bilan birga topiladi.

b) koordinatalar sistemasida F(–5; –2) kabi G(3; 4), H(–3; 0), J(–5; 3) K(4; –4) nuqtalarni ham koordinatalariga ko‘ra o‘quvchilar uyda belgilab kelishadi.



12. Koordinatalarga mos nuqtalarning harflarini toping.

(–6; 0) __D__

(–5; 6) __R__

(2; 8) __A__

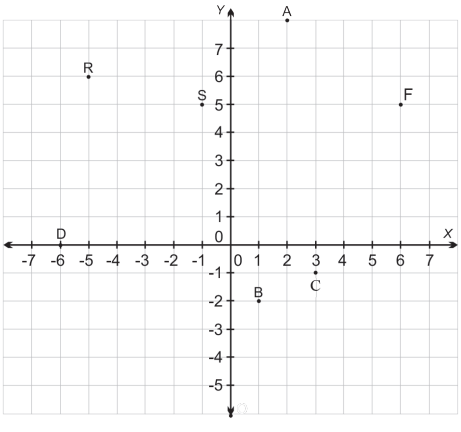
(3; –1) __C__

(1; –2) __B__

(6; 5) __F__

(–1; 5) __S__

(0; 0) __O__



Dekart koordinatalar sistemasida shakllar yasash

Barcha o‘quvchilar	Dekart koordinatalar sistemasida (*–x; y*) nuqtani belgilash kabi mashqlar bajara oladi.
Aksariyat o‘quvchilar	a) (2; 5) b) (4; 6) c) (–3; 5) d) (–4; –5) e) (3; –4) f) (5; 0) g) (0; 4) h) (–7; 0) i) (0; –4) l) (0; 0) ko‘rinishdagi nuqtalarni koordinatalar sistemasida belgilay oladi.
Ba’zi o‘quvchilar	Har qanday koordinatalar sistemasini belgilay oladi, unga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Dekart koordinatalar sistemasi nima uchun kerak? Hayotiy misollar keltiring.
2. Dekart koordinatalar sistemasida *x* ning manfiy nuqtalari qaysi choraklarda belgilanadi?
3. *x, y* o‘qlarning musbat nuqtalari dekart koordinata tekisligining qaysi choragida joylashadi?
4. Agar *x* musbat, *y* manfiy bo‘lsa-chi?
5. Agar *x* manfiy, *y* musbat bo‘lsa-chi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda koordinatalar sistemasida *x* va *y* o‘qlarni topishda ko‘p ishoralarda, ketma-ket belgilashda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta aytishi, mavzuga doir savollar, tarqatmalar tayyorlashi kerak.

➢ *Uyga vazifa*

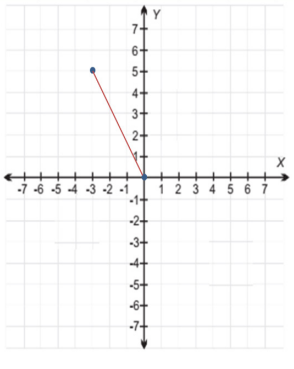
16-, 17-misollar (143-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Berilgan nuqtalar yordamida kesmalar yasang.

a) A(–3; 5) va C(0; 0) b) P(0; –3) va L(3; –5)

c) N(0; 4) va F(0; –4) d) E(–2; –2) va H(4; –2)



Eslatma: *AC va CA kesmalar turlicha tartibda nomlanmoqda, lekin bir kesmani anglatadi.*

a) A(–3; 5) va C(0; 0) nuqtalarni tutashtirib, kesama hosil qilindi.

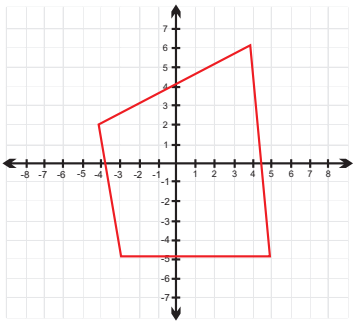
b) P(0; –3) va L(3; –5); c) N(0; 4) va F(0; –4); nuqtalarni tutashtirib, kesma hosil qilish o‘quvchilar bilan birgalikda bajariladi.

2. A(4; 2), B(2; –3), C(–2; 2) va D(1; –2) nuqtalardan eng ko‘pi bilan nechta turli kesmalar hosil qilish mumkin?

Javob: AB, AC, AD, BC, BD va CD kesmalarni hosil qilish mumkin.

3. Berilgan shaklning uchlari koordinatalarini aniqlang.

Javob: (–4; 2); (4; 6); (–3; –5); (5; –5) nuqtalar.



4. M(0; 5), N(3; –1) va K(–3; –1) nuqtalarni koordinatalar sistemasida belgilang va ularni tutashtiring. Qanday shakl hosil bo‘ldi?

Javob: M(0; 5), N(3; –1) va K(–3; –1) nuqtalarni tutashtirsak, uchburchak hosil bo‘ladi.

5. A (4; 3), B(–2; 3), C(–2; –2) va D(4; –2) nuqtalarni koordinatalar sistemasida belgilang va ularni tutashtiring. Qanday shakl hosil bo‘ldi?

Javob: to‘g‘ri to‘rtburchak hosil bo‘ladi.

6. Quyidagi nuqtalarni koordinatalar sistemasida belgilang va ularni ketma-ket birlashtirib shakllar yasang.

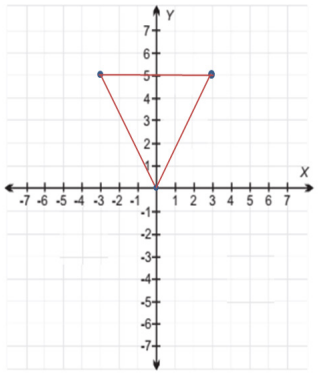
a) A (–3; 5), B (3; 5) va C (0; 0)

b) P (0; 0), R (–3; –5) va L (3; –5)

c) K (4; 0), N (0; 4), M (–4; 0) va F (0; –4)

Javob: a) A(–3; 5), B(3; 5) va C(0; 0) nuqtalarni ketma-ket tutashtirishdan uchburchak hosil bo‘ldi.

Qolgan shakllarni o‘quvchilar bilan birga yasang.



7. A (5; 4), B (1; 4), C (1; –2) nuqtalarni koordinatalar sistemasida belgilang. Shunday D (x; y) nuqtani aniqlangki, natijada ABCD to‘g‘ri to‘rtburchak hosil bo‘lsin.

Javob: agar to‘g‘ri to‘rtburchakning uchta uchi A(5; 4), B(1; 4) va C(1; –2) nuqtalar bo‘lsa, uning to‘rtinchi uchining koordinatasi D(5; –2) nuqta bo‘ladi.

8. A(1; 5), B(2; –4), C(0; –3) va D(–4: –2) nuqtalar bilan barcha mumkin bo‘lgan uchburchaklarni yasang.

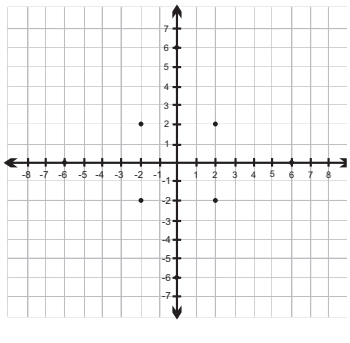
Javob: uchlari A(1; 5), B(2; –4), C(0; –3) va D(–4; –2) nuqtalarda bo‘lgan ABC, ABD, ACD va BCD uchburchaklarni hosil qilish mumkin.

9. A(0; 0) va C(5; 3) nuqtalar berilgan. To‘g‘ri to‘rtburchakni yasash uchun qolgan uchlari koordinatalarini toping. Bunday to‘rtburchaklardan nechta yasash mumkin?

Javob: ikkita A(0; 0) va C(5; 3) nuqtasi berilgan to‘g‘ri to‘rtburchakning qolgan uchlari B(0;3) va D(5; 0) nuqtalar bo‘ladi.

10. Berilgan nuqtalarni tutashtiring va koordinatalarini aniqlang.

Javob. Berilgan nuqtalarni aniqlaymiz: (2; 2), (–2; 2;), (–2; –2) va (2; –2). Bu nuqtalarni tutashtirish natijasida tomoni 4 birlikka teng kvadrat hosil bo‘ldi.



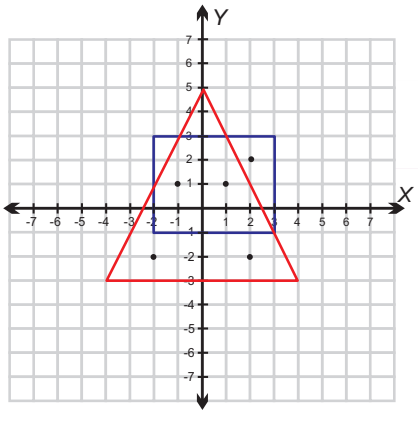
11. A(–3; 3), B(3; 3), C(3; –3) va D(–3; –3) nuqtalar yordamida kvadrat yasang va kvadrat ichidan shunday nuqta topingki, natijada 5 ta kvadrat hosil qilish mumkin bo‘lsin.

Javob: kvadrat ichidagi (0; 0) koordinatali nuqtani olib, tomonlariga parallel to‘g‘ri chiziq o‘tkazsak, yana to‘rtta kvadrat hosil bo‘lganini ko‘ramiz.

12. Koordinatalar sistemasida uchlari A(–4; 2), B(–4; –3), C(1; 2) va D(1; –3) nuqtalarda bo‘lgan uchburchak yasash mumkinmi?

Javob: ha, yasash mumkin. ABC, ABD, ACD va BCD uchburchaklarni hosil qilish mumkin.

13. Quyidagilarga mos ko‘rsatilgan nuqtalarni aniqlang va nomlang:



– to‘g‘ri to‘rtburchak ichida joylashgan;

– faqat to‘g‘ri to‘rtburchak ichidagi;

– faqat uchburchak ichida joylashgan;

– ham uchburchak, ham to‘g‘ri to‘rtburchak ichidagi.

Javob:

– to‘g‘ri to‘rtburchak ichida joylashgan nuqtalar – (–1;1), (1;1), (2;2);

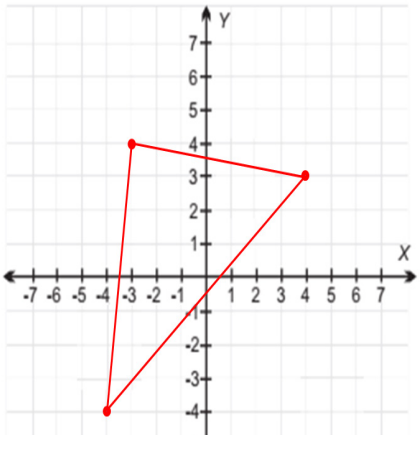
– faqat to‘g‘ri to‘rburchak ichidagi nuqta – (2; 2);

– faqat uchburchak ichida joylashgan nuqtalar – (–2; –2), (2; –2);

– ham uchburchak, ham to‘g‘ri to‘rtburchak ichidagi nuqtalar – (–1; 1), (1; 1).

14. Koordinatalar sistemasida A (4; 3), B (–3; 4) va C (–4; –4) nuqtalarni belgilab, uchburchak yasang.

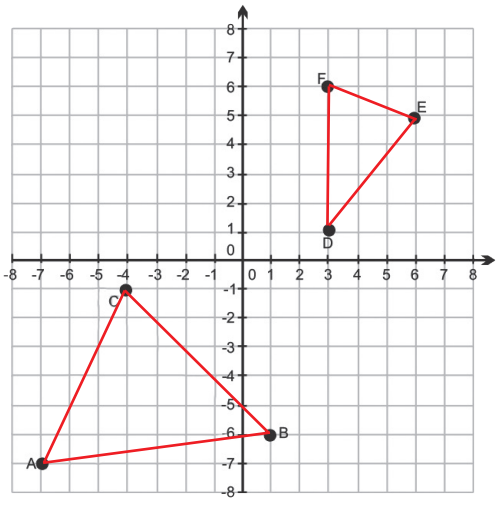
Yechish. Avval koordinatalar tekisligida berilgan nuqtalarni aniqlab olamiz, keyin ularni ketma-ket tutashtiramiz.

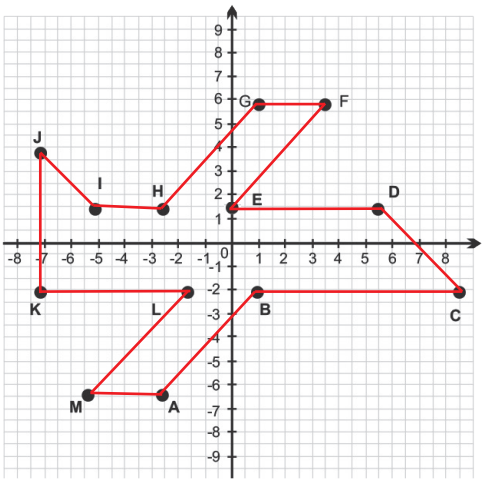


15. Kvadratning ikki uchi A (2; –2) va C (–2; 2) nuqtalarda joylashgan. Qolgan uchlarining koordinatalarini toping.

Yechish: kvadratning ikki uchi A(2; –2) va C(–2; 2) nuqtalarda joylashgan. Qolgan uchlarining koordinatalari (–2;–2) va (2;2) nuqtalardir.

16. Koordinatalar sistemasida berilgan nuqtalarning koordinatalarini aniqlang. Nuqtalarni tartib bilan tutashtirib qanday shaklni hosil qilish mumkin?





17. Uchlari A (2; 2), B (3; –2), C (–3; 2) va D (4; 2) nuqtalarda bo‘lgan nechta uchburchak yasash mumkin.

Javob: uchlari A(2,2), B(3, –2), C(–3,2) va D(4,2) nuqtalarda bo‘lgan ABC, ABD va BCD uchburchaklarni yasash mumkin.

A(2;2), C(–3;2) va D(4;2) nuqtalarning ordinatalari bir xil, bu nuqtalar bir to‘g‘ri chiziqda yotadi. Shuning uchun uchlari A, C va D nuqtalarda bo‘lgan uchburchak yasab bo‘lmaydi.

Uchburchak va uning elementlari

Barcha o‘quvchilar	Uchburchak va uning elementlari haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Uchburchaklar tengsizligi qoidasini, perimetrini va ichki uchburchaklar yig‘indisini biladi.
Ba’zi o‘quvchilar	Uchburchaklar tengsizligi qoidasini, perimetrini va ichki uchburchaklar yig‘indisini biladi va unga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Uchburchak nima? Hayotiy misollar keltiring.
2. Uchburchak yasash uchun avvalo qaysi qoidani bilish zarur?
3. Uchburchaklar tengsizligi qoidasini ayting.
4. Uchburchak ichki burchaklari yig‘indisi nechaga teng?
5. Perimetr nima?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda uchburchaklar tengsizligini topishda, ularni yasashda qiynaladi. Bu holatning oldini olish uchun o‘qituvchi o‘quvchilarga mavzuni tushuntirayotganda shunga doir savollar, tarqatmalar berishi va uchburchaklarni ko‘proq chizdirishi zarur.

➢ *Uy vazifa*

15-, 16-misollar (146-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Berilgan kesmalardan uchburchak yasash mumkinmi?

a) 3 cm, 7 cm, 9 cm

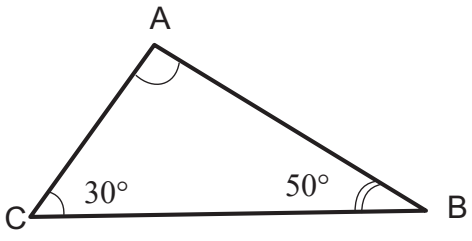
b) 4,3 cm, 6,5 cm, 10,1 cm

Yechish. Bu savolga uchburchak tomonlari orasidagi munosabatdan javob topiladi, agar uning tomonlari uchun $a > b > c$ munosabat o‘rinli bo‘lsa va $a > b - c$, $a < b + c$ tengsizliklar bajarilsa, a, b, c kesmalardan uchburchak yasash mumkin.

2. Berilgan uchburchakning A burchagini toping.

Yechish. Berilgan uchburchakning A burchagini topishda uning barcha burchaklari yig‘indisi 180^o ekanidan foydalanamiz.

$\angle A + \angle B + \angle C = 180^o$ ekanidan $\angle C = 30^o$, $\angle B = 50^o$ larni dastlabki tenglikka qo‘ysak, $\angle A + 50^o + 30^o = 180^o$ tenglama hosil bo‘ladi, bundan $\angle A = 100^o$ ekani kelib chiqadi.

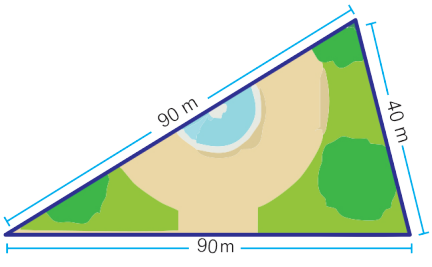


3. Quyidagi maydonning perimetrini toping.

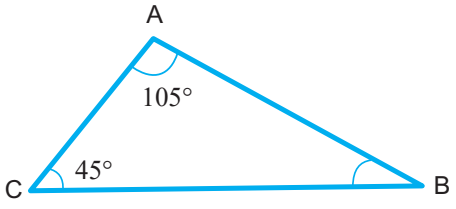
Yechish: maydon uchburchak shaklida, shuning uchun perimetrini topishda $P = a + b + c$ formuladan foydalanamiz.

$a = 90$ m, $b = 90$ m, $c = 40$ m.

$P = 90\text{ m} + 90\text{ m} + 40\text{ m} = 220$ m.



4. Berilgan uchburchakning noma’lum burchagini toping.

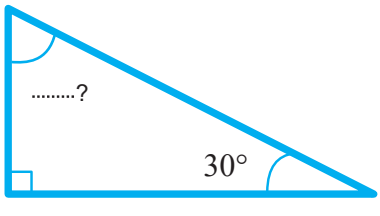


Yechish. Uchburchakning B burchagini topishda uning barcha burchaklari yig‘indisi 180^o ekanidan foydalanamiz.

$\angle A + \angle B + \angle C = 180^o$ ekani ma’lum. $\angle A = 105^o$, $\angle C = 45^o$ ni tenglikka qo‘ysak, $105^o + \angle B + 45^o = 180^o$ tenglama hosil bo‘ladi.

Demak, $\angle B = 30^o$.

5. Berilgan uchburchakning noma’lum burchagini toping.

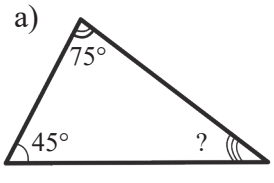


Yechish: Uchburchakning bir burchagi 90° (to‘g‘ri burchak), qolgan burchaklaridan biri 30° ga teng bo‘lsa, uchinchi burchagini topamiz.

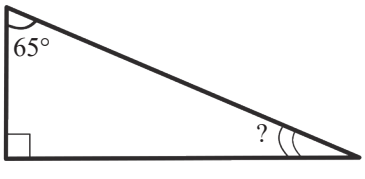
$\angle A + \angle B + \angle C = 180^o$ ekani ma’lum. 90^o, 30^o li burchaklar bor. Uchinchi burchagini topamiz. $90^o + 30^o = 120^o$ ekani bizga ma’lum. Demak, noma’lum burchak $180^o - 120^o = 60^o$.

6. Uchburchaklardagi noma’lum burchaklarni aniqlang.

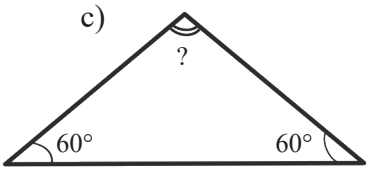
a)



b)



c)

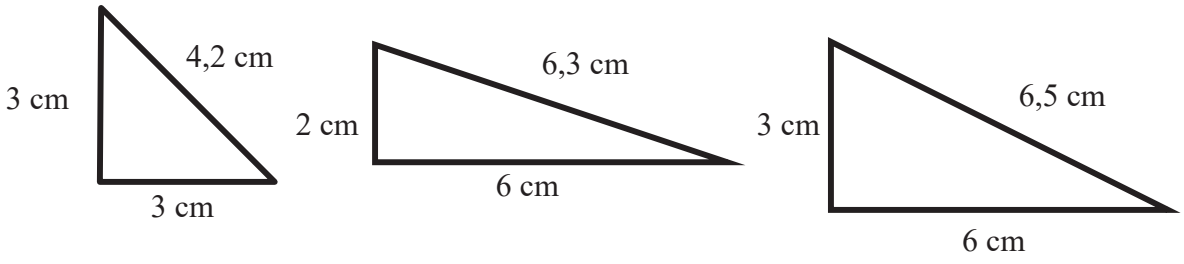


1) $180^o - 75^o - 45^o = 60^o$

2) $180^o - 90^o - 65^o = 25^o$

3) $180^o - 60^o - 60^o = 60^o$

7. Eng katta perimetrga ega uchburchakni aniqlang.

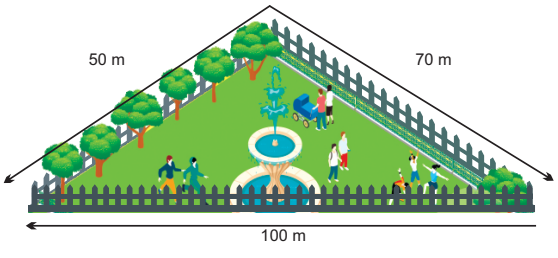


Eng katta perimetrga ega uchburchakni aniqlash uchun har bir uchburchakning perimetrini hisoblashimiz kerak.

1) $a = 3$ cm, $b = 4{,}2$ cm, $c = 3$ cm. $P = 3$ cm $+ 4{,}2$ cm $+ 3$ cm $= 10{,}2$ cm.
2) $a = 6{,}3$ cm, $b = 6$ cm, $c = 2$ cm. $P = 6{,}3$ cm $+ 6$ cm $+ 2$ cm $= 14{,}3$ cm.
3) $a = 6{,}5$ cm, $b = 6$ cm, $c = 3$ cm. $P = 6{,}5$ cm $+ 6$ cm $+ 3$ cm $= 15{,}5$ cm.

Demak, uchinchi uchburchakning perimetri eng katta.

8. Bog‘ atrofini o‘rash uchun necha metr to‘siq ishlatilgan?



Yechish: bog‘ uchburchak shaklida, uni o‘rash uchun uchburchak perimetri uzunligida to‘siq kerak.

$a = 100$ m, $b = 70$ m, $c = 50$ m.

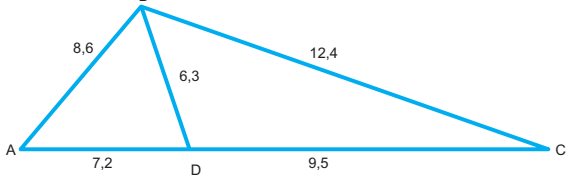
$P = a + b + c = 100$ m $+ 70$ m $+ 50$ m $= 220$ m.

9. Uzunliklari 3, 4, 5, 6, 7 va 8 cm bo‘lgan kesmalardan nechta turli tomonli uchburchak yasash mumkin?

Yechish. Uzunliklari 3, 4, 5, 6, 7 va 8 cm bo‘lgan kesmalardan nechta turli tomonli uchburchak yasash mumkinligini uchburchakning tomonlari orasidagi munosabatlardan topamiz. Agar uchburchakning tomonlari uchun $a > b >$ c munosabat o‘rinli bo‘lsa, bu kesmalar uzunliklari uchun $a > b - c$, $a < b + c$ tengsizliklar bajarilsa a, b, c kesmalardan uchburchak yasash mumkin.

Tomonlari (3, 4, 5); (3, 4, 6); (3, 5, 6); (3, 5, 7); (3, 6, 7); (3, 6, 8); (3, 7, 8); (4, 5, 6); (4, 5, 7); (4, 5, 8); (4, 6, 7); (4, 6, 8); (4, 7, 8); (5, 6, 7); (5, 6, 8); (5, 7, 8); (6, 7, 8) kesmalardan tuzilgan uchburchaklar yasash mumkin.

10. Berilgan chizmadagi uchburchaklar perimetrlarini hisoblang.

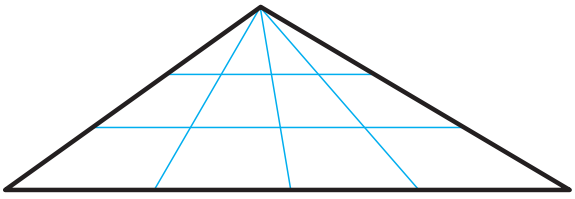


Yechish: $AB = 8{,}6$; $BC = 12{,}4$; $AC = 7{,}2 + 9{,}5 = 16{,}7$; $AD = 7{,}2$; $CD = 9{,}5$; $BD = 6{,}3$.

$P(ABD) = 8{,}6 + 6{,}3 + 7{,}2 = 22{,}1$; $P(BDC) = 12{,}4 + 6{,}3 + 9{,}5 = 28{,}2$;

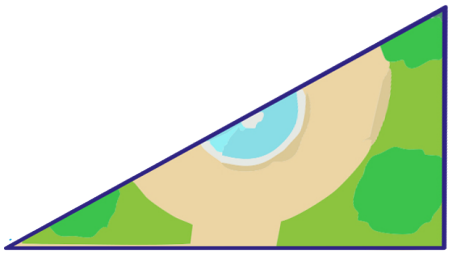
$P(ABC) = 8{,}6 + 12{,}4 + 16{,}7 = 37{,}7$.

11. Berilgan chizmada uchburchaklar soni nechta?



Javob. Chizmada uchburchaklar soni 30 ta. Qismini olsak, undagi uchburchaklar soni 10 ta. Shunga o‘xshash shakllar 3 ta.

12. Guli tomonining uzunliklari 3 m, 4 m va 5 m bo‘lgan uchburchak shaklidagi gulzori atrofiga gul ekmoqda. U har 20 cm ga bir tup gul eksa, jami necha tup gul ekadi?

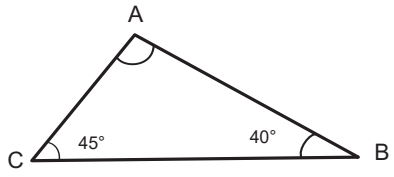


Yechish. Avval uchburchak shaklidagi gulzorning perimetrini topamiz.

1) $P = 3\text{ m} + 4\text{ m} + 5\text{ m} = 12\text{ m}$.

12 m = 1 200 cm = 60 × 20 cm. Agar u har 20 cm ga bitta gul eksa, jami 60 tup gul ekadi.

13. Berilgan uchburchakning qolgan burchagini toping.



Yechish. Uchburchakning A burchagini topishda uning barcha burchaklari yig‘indisi 180° ekanidan foydalanamiz.

$\angle A + \angle B + \angle C = 180^\circ$ ekani ma’lum.

$\angle B = 40^\circ$, $\angle C = 45^\circ$ tenglikka qo‘ysak,

$\angle A + 40^\circ + 45^\circ = 180^\circ$ tenglama hosil bo‘ladi, bundan $\angle A = 95^\circ$ kelib chiqadi.

14. Jadvalni to‘ldiring (a, b, c – uchburchak tomonlari).

a	b	c	Perimetri
6,5 cm	7,2 cm	8,7 cm	22,4 dm
2,8 dm	1,4 dm	1,6 dm	5,8 dm
25 cm	2,5 dm	2,5 dm	75 cm
1,7 dm	1,7 dm	2,4 dm	5,8 dm

15. Berilgan kesmalar uchburchakning tomonlari bo‘lsa, uning perimetrini toping.

a) $AB = 7{,}6$ cm, $BC = 4{,}5$ cm, $CA = 6{,}3$ cm. $P = 7{,}6\text{ cm} + 4{,}5\text{ cm} + 6{,}3\text{ cm} = 18{,}4\text{ cm}$.

b) $PQ = 4$ cm, $QR = 3$ cm, $RP = 5$ cm. $P = 4\text{ cm} + 3\text{ cm} + 5\text{ cm} = 12\text{ cm}$.

c) $LM = 4{,}5$ dm, $MN = 3{,}6$ dm, $NL = 6{,}2$ dm. $P = 4{,}5\text{ cm} + 3{,}6\text{ cm} + 6{,}2\text{ cm} = 14{,}3\text{ cm}$.

16. Uchburchakning burchaklari $2x$, $3x$, $4x$ ga teng. Har bir burchak necha gradusdan?

Yechish: uchburchakning burchaklari $2x$, $3x$, $4x$ ga teng bo‘lsa, uning har bir burchagining kattaligini topish uchun $\angle A + \angle B + \angle C = 180^\circ$ dan foydalanamiz.

$2x + 3x + 4x = 180^\circ \rightarrow 9x = 180^\circ \rightarrow x = 180^\circ \div 9 \rightarrow x = 20^\circ$

Uchburchakning burchaklari: $2x = 40^\circ$, $3x = 60^\circ$, $4x = 80^\circ$ ga teng.

Uchburchakning turlari

Barcha o‘quvchilar	Uchburchak turlarini farqlay oladi.
Aksariyat o‘quvchilar	Burchaklar yig‘indisiga doir misollar yecha oladi.
Ba’zi o‘quvchilar	Uchburchaklar tengsizligiga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Uchburchakning tomonlariga ko‘ra nechta turi mavjud?
2. To‘g‘ri burchakli uchburchakning nechta burchagi 90^o?
3. O‘tmas burchak, o‘tkir burchak, to‘g‘ri burchakka misol ayta olasizmi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

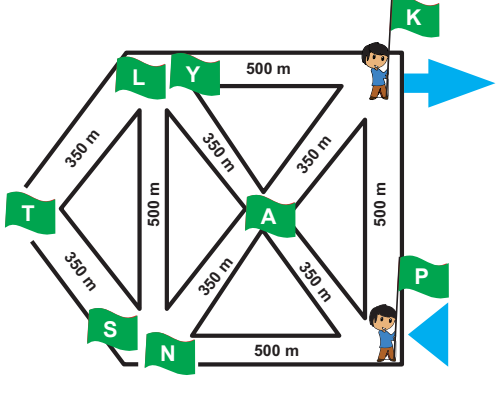
O‘quvchilar odatda uchburchaklarga doir chizmalarda ko‘p xato qilishadi, transportirda chizishga qiynalishadi. Bunday holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda shu haqda qayta-qayta ta’kidlashi kerak.

➢ *Uyga vazifa*

16-, 17-, 20-misollar (149-, 150-betlar)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Bayroqchalardagi harflarni tartiblash orqali marraga yetish uchun eng qisqa yo‘lni toping.



Yechish. Bola hamma bayroqchalarni ketma-ket olishi kerak. U bu bayroqchalarni eng qisqa yo‘l bosish orqali olishi so‘ralmoqda. Bolada bor imkoniyatlar bilan tanishib chiqamiz:

– PNSTLYAK ketma-ketlikda yursa, 1 900 m yo‘l bosadi;

– PANSTLYK ketma-ketlikda yursa, 1 900 m yo‘l bosadi;

– PAYNSTLK ketma-ketlikda yursa, 2 400 m yo‘l bosadi. Boshqa yo‘nalishlar bo‘yicha harakatini o‘quvchilar bilan o‘rganib chiqing.

2. Yuqoridagi rasmda qanday uchburchaklar berilgan?

Javob: rasmda *ANP*, *AKP*, *ANY*, *AKY*, *STL* teng yonli uchburchaklar berilgan.

3. Teng yonli uchburchakning perimetri 60 cm. Uning yon tomoni 22 cm bo‘lsa, asosini toping.

Yechish. Teng yonli uchburchak perimetri $P = a + 2b$ formulasiga asosan a ni topib olamiz.

$a = P - 2b = 60\text{ cm} - 2 \times 22\text{ cm} = 60\text{ cm} - 44\text{ cm} = 16\text{ cm}$.

Javob. 16 cm.

4. Teng tomonli (muntazam) uchburchakning perimetri 45 cm bo‘lsa, uning tomonini aniqlang.

Yechish: teng tomonli uchburchak perimetri $P = 3a$ formulasiga asosan a ni topib olamiz.

$a = P \div 3 = 45 \text{ cm} \div 3 = 15 \text{ cm}$.

Javob: 15 cm.

5. Uchburchakning perimetri 24 cm. Uning qo‘shni tomonlari 8 cm va 9 cm. Uchinchi tomonining uzunligi qancha?

Yechish: uchburchak perimetri $P = a + b + c$ formulasiga asosan c ni topib olamiz.

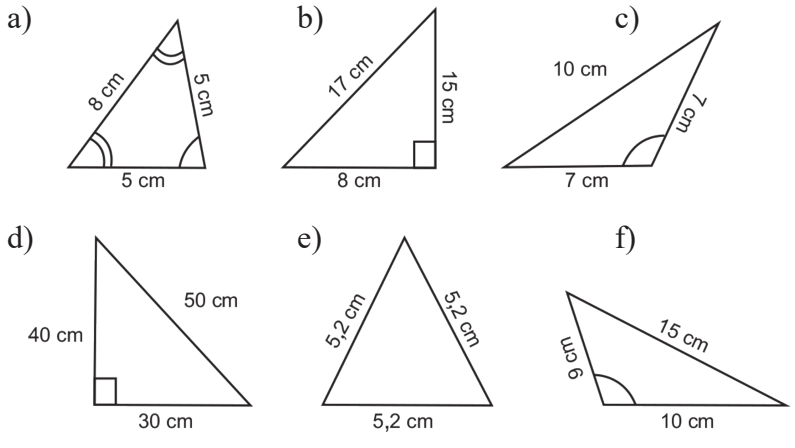
$c = P - b - a = 24 \text{ cm} - 8 \text{ cm} - 9 \text{ cm} = 7 \text{ cm}$.

Javob: 7 cm.

6. Uchburchakning har bir tomoni perimetrining uchdan biriga teng. Bu qanday uchburchak?

Javob: teng tomonli uchburchak.

7. Berilgan uchburchaklarning tomonlariga ko‘ra turini aniqlang va perimetrini toping.



Javob: uchburchaklarning tomonlariga ko‘ra turlarini aniqlaymiz.

a) teng yonli, $P = 8 + 5 + 5 = 18$ cm;

b) to‘g‘ri burchakli, $P = 40$ cm;

c) o‘tmas burchakli, $P = 24$ cm;

d) to‘g‘ri burchakli, $P = 120$ cm;

e) teng tomonli, $P = 15{,}6$ cm;

f) o‘tmas burchakli, $P = 34$ cm;

8. Teng yonli uchburchakning teng burchaklari 55° bo‘lsa, uning uchinchi burchagini toping.

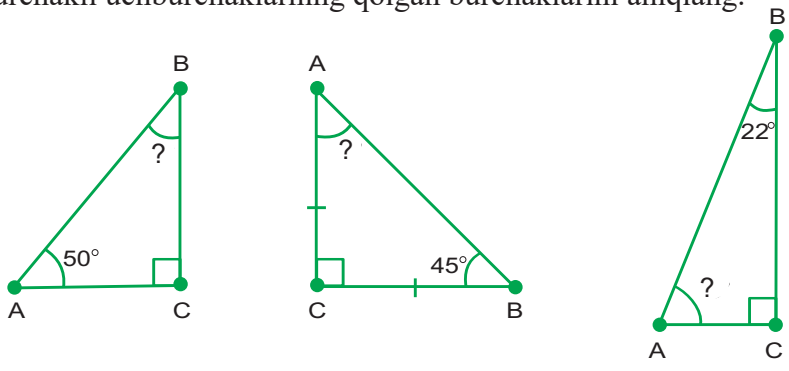
Yechish: teng yonli uchburchakning ikkita burchagi teng bo‘ladi. Uning teng burchaklari 55° bo‘lsa, uchinchi burchagi: $180° - (55° + 55°) = 180° - 110° = 70°$.

Javob: 70°.

9. Uzunliklari 7 cm va 8 cm bo‘lgan kesmalardan uchburchaklar yasang. Hosil bo‘lgan uchburchaklarning perimetrini toping.

Javob: uzunliklari 7 cm va 8 cm bo‘lgan kesmalardan tomonlari (7; 7; 7), (7; 7; 8), (7; 8; 8), (8; 8; 8) uzunliklarga ega kesmalardan uchburchaklar yasash mumkin.

10. To‘g‘ri burchakli uchburchaklarning qolgan burchaklarini aniqlang.



Yechish.

1) Berilgan ABC to‘g‘ri burchakli uchburchakning B burchagi noma’lum. Uning barcha burchaklari yig‘indisi 180° ekanidan foydalanamiz.

$\angle A + \angle B + \angle C = 180^\circ$ ekanidan $\angle A = 50^\circ$, $\angle C = 90^\circ$ ga teng. $\angle B + 90^\circ + 50^\circ = 180^\circ$ tenglama hosil bo‘ladi, bundan $\angle B = 40^\circ$ kelib chiqadi.

Qolgan ikkita to‘g‘ri burchakli uchburchaklarning noma’lum burchaklarini o‘quvchilar bilan topasiz.

11. Teng yonli uchburchakning qo‘shni burchaklari ayirmasi 24° ga teng bo‘lsa, uning barcha burchaklarini toping.

Yechish. Teng yonli uchburchakda ikkita teng burchak bor, uchinchi burchak ulardan farqli. Ayirmasi deyilganda teng bo‘lmagan burchaklar aytilmoqda.

1) $180^\circ + 24^\circ = 204^\circ$ 2) $204^\circ \div 3 = 68^\circ$

Teng yonli uchburchakning teng burchaklari 68° dan ekan, demak, uning uchinchi burchagi $180^\circ - (68^\circ + 68^\circ) = 44^\circ$ ga teng.

12. Koordinatalar sistemasida berilgan nuqtalarni belgilab uchburchak turini aniqlang.

a) A (–1; 0), B (2; 3) va C (5; 0)
b) F (–2; –2), N (–2; 3) va M (1; –2)
c) D (0; 0), T (–3; 4) va H (5; 0)
d) L (–4; 6), U (2; –3) va E (–4; –3)

Ko‘rsatma: *“Dekart koordinatalar sistemasida shakllar yasash” mavzusidan foydalaning.*

13. Qanday uchburchaklarni ko‘ryapsiz?

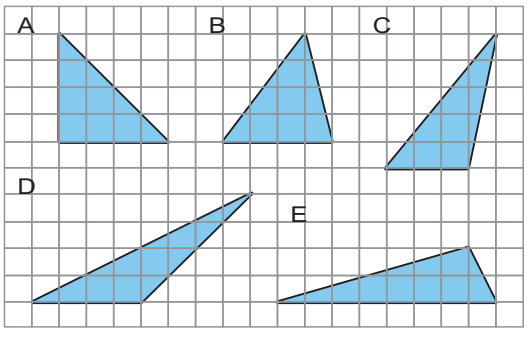
Javob:

A uchburchak – to‘g‘ri burchakli uchburchak;

B uchburchak – o‘tkir burchakli uchburchak;

C, D, E uchburchaklar – o‘tmas burchakli uchburchaklardir.

O‘quvchilarga uchburchakning tomonlari bo‘yicha turlarini mustaqil topishni ayting.



14. Berilgan burchaklar asosida uchburchak turini aniqlang.

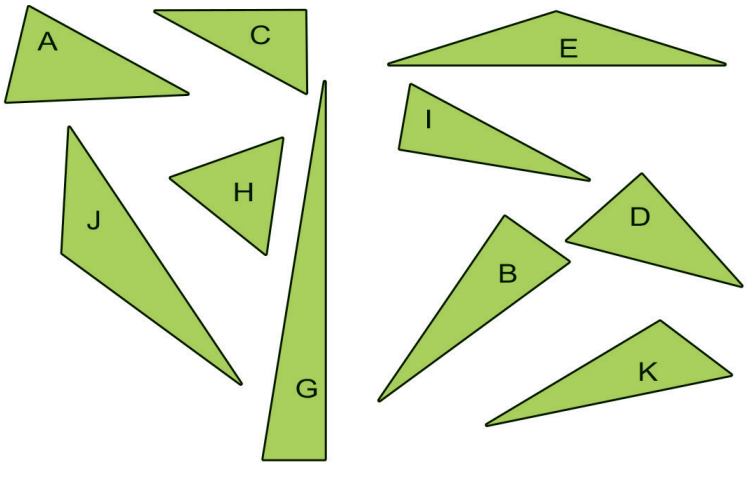
a) 90°, 45°, 45° b) 60°, 60°, 60° c) 80°, 60°, 40°
d) 130°, 40°, 10° e) 90°, 35°, 55° f) 92°, 38°, 50°

Javob:
– a va e burchaklari bo‘lgan uchburchaklar to‘g‘ri burchakli uchburchak;
– b burchaklari bo‘lgan uchburchaklar teng tomonli uchburchak;
– c burchaklari bo‘lgan uchburchaklar o‘tkir burchakli uchburchak;
– d, f burchaklari bo‘lgan uchburchaklar o‘tmas burchakli uchburchak.

15. Teng yonli uchburchakning uchidagi burchagi 70° gradusga teng. Uning qolgan burchaklarini aniqlang.

Yechish. Masala shartida teng yonli uchburchakning uchidagi burchagi 70° gradusga tengligi berilgan. Teng yonli uchburchakning qolgan ikkita burchagi o‘zaro teng ekani bizga ma’lum. Ularni topamiz: 180° – 70° = 110° → 110° ÷ 2 = 55°. Uchburchakning asosidagi burchaklari 55° dan ekani kelib chiqdi.

16. Uchburchaklarni tomonlariga ko‘ra turlarga ajrating.



Ko‘rsatma: o‘quvchilar chizg‘ich yordamida tomonlarni o‘lchab, uning turini aniqlaydi.

17. Muntazam uchburchakning bir tomoni 4,3 dm ga teng. Uning perimetrini toping.

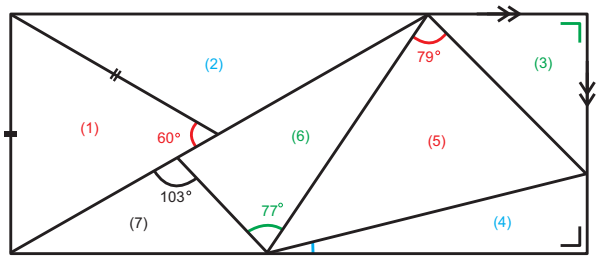
Yechish. Teng yonli uchburchak perimetri $P = 3a$ formulasiga asosan P ni topmiz.

$P = 3 \times a = 3 \times 4{,}3$ cm $= 12{,}9$ cm.

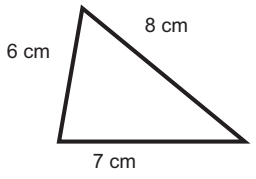
Javob: 12,9 cm.

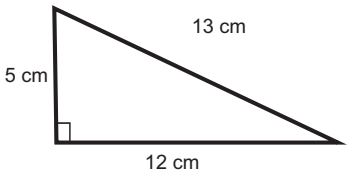
18. Barcha uchburchaklarning turlarini aniqlang.

Javob:
(1) – muntazam uchburchak;
(2), (3), (6) – teng yonli uchburchak;
(3), (4) – to‘g‘ri burchakli uchburchak;
(7) – o‘tmas burchakli uchburchak;
(5) – o‘tkir burchakli uchburchak.



19. Berilgan uchburchaklarning perimetrlarini toping.







Berilgan uchburchaklarning perimetrlarini topish uchun uchburchakning barcha tomonlari yig‘indisini topamiz.

1) $a = 6$ cm, $b = 8$ cm, $c = 7$ cm. $P = a + b + c = 6$ cm $+ 8$ cm $+ 7$ cm $= 21$ cm.
2) $a = 5$ cm, $b = 12$ cm, $c = 13$ cm. $P = a + b + c = 5$ cm $+ 12$ cm $+ 13$ cm $= 30$ cm.
3) $a = 9$ cm, $b = 11$ cm, $c = 17$ cm. $P = a + b + c = 9$ cm $+ 11$ cm $+ 17$ cm $= 37$ cm.

20. Uchburchakning tomonlariga ko‘ra turlarini aniqlang.

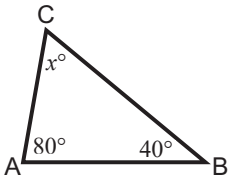
a) 6 cm, 3 cm, 5 cm
b) 6 cm, 6 cm, 6 cm
c) 7 cm, 7 cm, 5 cm
d) 8 cm, 12 cm, 10 cm
e) 3 cm, 4 cm, 5 cm
f) 3,5 cm, 3,5 cm, 4,5 cm

Javoblar:

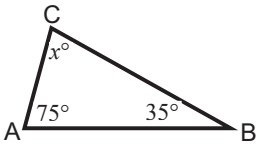
a) tomonlari 6 cm, 3 cm, 5 cm bo‘lsa – turli tomonli uchburchak;
b) tomonlari 6 cm, 6 cm, 6 cm bo‘lsa – teng tomonli (muntazam) uchburchak;
c) tomonlari 7 cm, 7 cm, 5 cm bo‘lsa – teng yonli uchburchak;
d) tomonlari 8 cm, 12 cm, 10 cm bo‘lsa – turli tomonli uchburchak;
e) tomonlari 3 cm, 4 cm, 5 cm bo‘lsa – turli tomonli uchburchak;
f) tomonlari 3,5 cm, 3,5 cm, 4,5 cm bo‘lsa – teng yonli uchburchak.

21. Berilgan uchburchaklarning uchinchi burchagini toping.

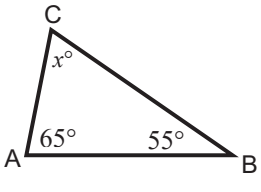
a)



b)



c)



a) $180° - (80° + 40°) = 60°$ b) $70°$ c) $60°$

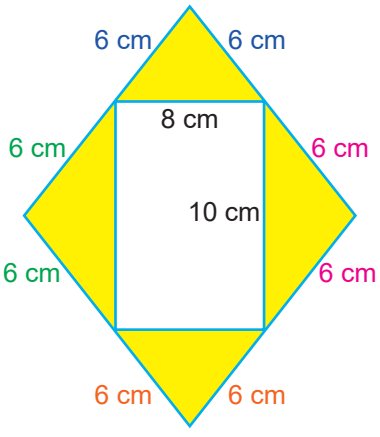
22. Quyidagidek burchaklar va tomonlarga ega uchburchak bo‘lishi mumkinmi? Javobingizni asoslang.

Yechish:

a) 110°, 60°, 30° – bo‘lishi mumkin emas, chunki berilgan burchaklar uchburchakning burchaklari bo‘lsa, ularning yig‘indisi 180° bo‘lishi kerak edi: $110° + 60° + 30° = 200°$.

b) 70°, 70°, 70° – yo‘q, bo‘lmaydi;
c) 80°, 35°, 65° – ha, bo‘ladi;
d) 7 cm, 3 cm, 4 cm – yo‘q, bo‘lmaydi;
e) 50°, 50°, 90° – yo‘q, bo‘lmaydi;
f) 10 cm, 12 cm, 2 cm – yo‘q, bo‘lmaydi;

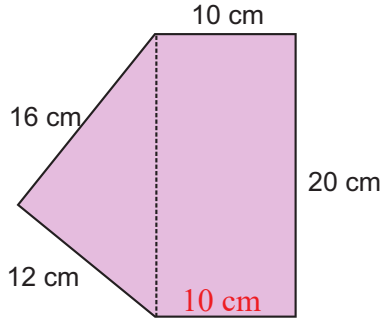
23. Bo‘yalgan shaklning perimetrini toping.



Yechish: bo‘yalgan shakl perimetrini topish uchun barcha uchburchaklarning perimetrini topamiz.

$P = 2 \times (6 + 6 + 8) + 2 \times (6 + 6 + 10) = 2 \times 20 - 2 \times 22 = 40 + 44 = 84$ cm.

24. Shaklning perimetrini toping.



Javob: $P = 10 + 20 + 10 + 12 + 16 = 68$ cm.

Uchburchakning yuzi

Barcha o‘quvchilar	Uchburchakning yuzi haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Uchburchakning tomonlariga ko‘ra yuzini topadi.
Ba’zi o‘quvchilar	Shakllarning tengini topadi va har qanday bir tomoni balandligi berilgan uchburchaklarning yuziga doir masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Uchburchak yuzi qanday topiladi? Hayotiy misollar keltiring.
2. Uchburchak yuzini topish uchun qanday qoidani bilish zarur?
3. Uchburchaklar tengsizligi qoidasini ayting.
4. Uchburchak ichki burchaklari yig‘indisi nechaga teng?
5. Uchburchakning balandligi nima?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

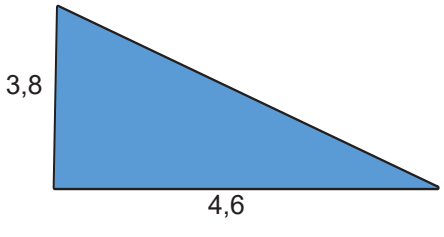
O‘quvchilar odatda uchburchak yuzini topishdan ko‘ra ularni chizishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda mavzuga doir tarqatmalar berishi va uchburchaklarni ko‘proq chizdirishi zarur.

➢ *Uyga vazifa*

16-, 17-, 18-misollar (154-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Rasmdagidek tomonlari 3,8 cm va 4,6 cm bo‘lgan to‘g‘ri burchakli uchburchak yuzini toping.

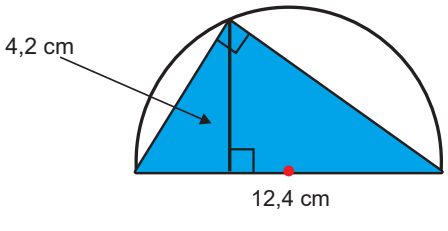


Yechish. Yuzni topish uchun $S = \frac{1}{2}ah$ formuladan foydalanamiz.

$a = 4{,}6$ cm; $h = 3{,}8$ cm ga teng. Bu qiymatlarni formulaga qo‘yib: $S = \frac{1}{2}ah = \frac{1}{2} \times 4{,}6 \times 3{,}8 = 8{,}74$ ni topamiz.

Javob: $S = 8{,}74$ cm^2.

2. Quyidagi bo‘yalgan shakl yuzini toping.

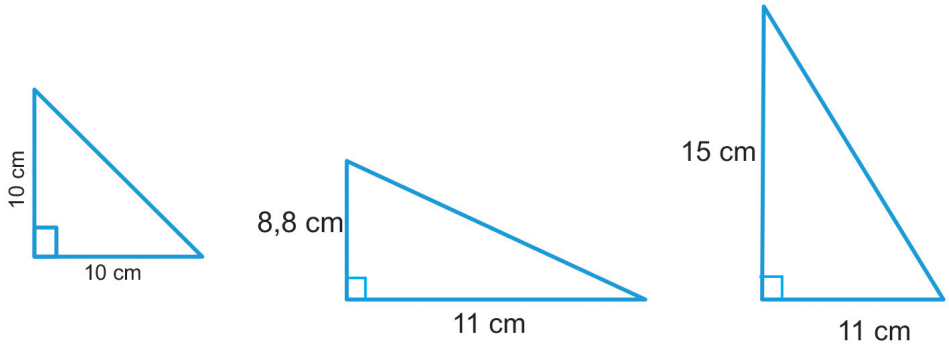


Yechish: bo‘yalgan shakl uchburchakdan iborat. Demak, uning yuzini topamiz:

$$S = \frac{1}{2}ah = \frac{1}{2} \times 12{,}4 \times 4{,}2 = 26{,}04$$

Javob: bo‘yalgan shakl yuzasi $S = 26{,}04$ cm^2.

3. Quyidagi uchburchaklar ichida eng katta yuzaga ega bo‘lganini aniqlang.



Yechish. Uchburchaklar ichida eng katta yuzaga ega bo‘lganini aniqlash uchun hamma uchburchaklar yuzalarini hisoblash va natijalarini taqqoslash kerak. To‘g‘ri burchakli uchburchak yuzi $S = \frac{1}{2}ab$ formula orqali topiladi.

a) $a = 10$ cm, $b = 10$ cm, $S = \frac{1}{2}ab = \frac{1}{2} \times 10 \times 10 = 50$ cm^2.

b) $a = 11$ cm, $b = 8{,}8$ cm, $S = \frac{1}{2}ab = \frac{1}{2} \times 11 \times 8{,}8 = 48{,}4$ cm^2.

c) $a = 11$ cm, $b = 15$ cm, $S = \frac{1}{2}ab = \frac{1}{2} \times 11 \times 15 = 82{,}5$ cm^2.

Javob: *c* uchburchak eng katta yuzaga ega.

4. To‘g‘ri burchakli teng yonli uchburchakning yuzi 50 dm^2 ga teng. Uning teng tomonlari uzunligini toping.

Yechish: to‘g‘ri burchakli uchburchak yuzi $S = \frac{1}{2}ab$ formula orqali topiladi. Bu uchburchak ham teng yonli bo‘lgani uchun $a = b$ bo‘ladi.

Bu formuladan $a^2 = 2 \times S$ ga ega bo‘lamiz. U holda $a^2 = 2 \times S = 2 \times 50 = 100$ kelib chiqadi. Bundan $a = 10$ cm ekanini topamiz.

Javob: $a = b = 10$ cm.

5. Uchburchakning yuzi 36 cm^2 ga teng bo‘lib, uchburchakning a tomoniga tushirilgan balandligi 12 cm ga teng. a tomonning uzunligini toping.

Yechish: uchburchak yuzini hisoblash formulasiga barcha berilganlarni qo‘ysak,

$S = \frac{1}{2}ah \quad \Rightarrow \quad 36 = \frac{1}{2} \times a \times 12$ kelib chiqadi.

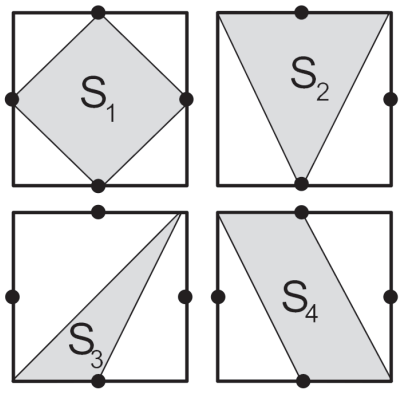
a noma’lumga nisbatan tenglamani yechib, $a = 6$ cm ekanini topamiz.

Javob: 6 cm.

6. Quyidagi bo‘yalgan yuzalar ichidan qaysilari teng?

Yechish: S_1, S_2, S_4 bo‘yalgan sohalarni bo‘laklarga ajratib, o‘rnini almashtirsak, kvadratning yarmini hosil qilyapti. S_3 bo‘yalgan sohani bo‘laklarga ajratib, o‘rnini almashtirsak, kvadratning choragini hosil qilyapti.

Demak, $S_1 = S_2 = S_4 \neq S_3$.



7. Uchburchakning bir tomoni uzunligi 10 cm ga, unga tushirilgan balandlik 5,4 cm ga teng. Bu uchburchakning yuzini toping.

Ko‘rsatma: *shu mavzudagi 1-topshiriqning yechilishidan foydalaning.*

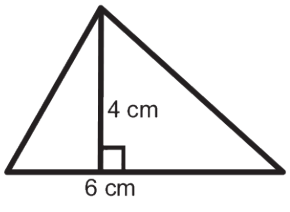
8. Katak daftarda A nuqtani belgilang.

A nuqtadan o‘ng tomonga 8 cm 5 mm li AB kesma chizing.
Shu kesmaning A nuqtasida BAC 90° li burchak yasang.
AC kesmaning uzunligini 6 cm 4 mm qilib belgilang.
ABC uchburchak yuzini hisoblang.

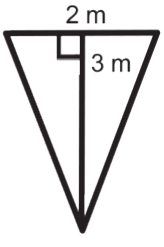
Ko‘rsatma: *topshiriqni amaliy bajarish tavsiya etiladi. Ip yoki sim bo‘lagidan berilgan o‘lchamlarga mos qism oling. 90° li burchakni transportir asbobisiz hosil qilish mumkinligini o‘quvchilarga eslating.*

9. Quyidagi uchburchaklarning yuzlarini toping.

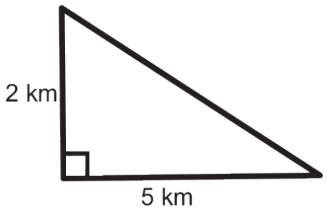
a)



b)

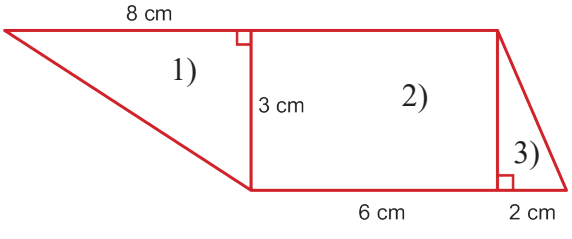


c)



a) $S = 12$ cm^2 b) $S = 3$ m^2 c) $S = 5$ km^2

10. Quyidagi shakl yuzini hisoblang.



Yechish. Yuzani hisoblash uchun shaklni bo‘laklarga ajratamiz.

1) $S_1 = \frac{1}{2}ab = \frac{1}{2} \times 8 \times 3 = 12$ cm^2.

2) $S_2 = 18$ cm^2.

3) $S_3 = \frac{1}{2}ab = \frac{1}{2} \times 2 \times 3 = 3$ cm^2.

Barcha bo‘laklarning yuzlarini qo‘shamiz:

$S = S_1 + S_2 + S_3 = 12 + 18 + 3 = 33$ cm^2.

11. Perpendikulyar tomonlari 2,5 dm va 4,8 dm bo‘lgan to‘g‘ri burchakli uchburchak yuzini hisoblang.

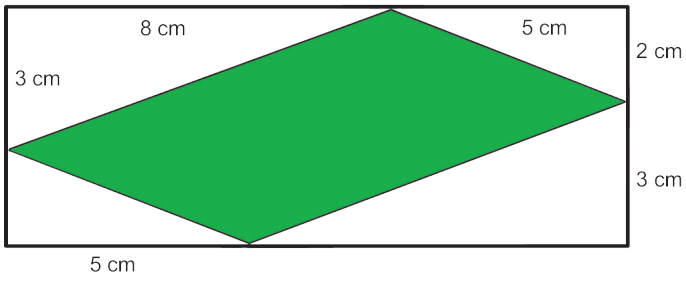
Yechish: Perpendikulyar tomonlari 2,5 dm va 4,8 dm bo‘lgan to‘g‘ri burchakli uchburchakda istalganini asos, ikkinchisini balandlik deb olib, yuzini hisoblaymiz.

Aytaylik, $a = 4{,}8$ dm, $b = 2{,}5$ dm bo‘lsin yoki aksincha. Yuzni topish uchun $S = \frac{1}{2}ab$ formuladan foydalanamiz. Bundan $S = 6$ dm^2 kelib chiqadi.

12. Jadvalni to‘ldiring.

	Tomoni	Balandligi	Yuzasi
a	8 cm	7 cm	28 cm^2
b	8 cm	9 cm	36 cm^2
c	4 cm	5 cm	10 cm^2
d	4 cm	3 cm	6 cm^2
e	6 cm	7 cm	21 cm^2
f	8 cm	11 cm	44 cm^2

13. Quyidagi bo‘yalgan shakl yuzini toping.



Bo‘yalgan shakl yuzini to‘g‘ri to‘rtburchak yuzidan to‘g‘ri burchakli uchburchaklarning yuzalarini ayirish orqali topamiz.

1) $S_{TT} = a \times b = 13 \times 5 = 65$ cm^2

2) $S_1 = \frac{1}{2}ah = \frac{1}{2} \times 8 \times 3 = 12$

3) $S_2 = \frac{1}{2}ah = \frac{1}{2} \times 5 \times 2 = 5$

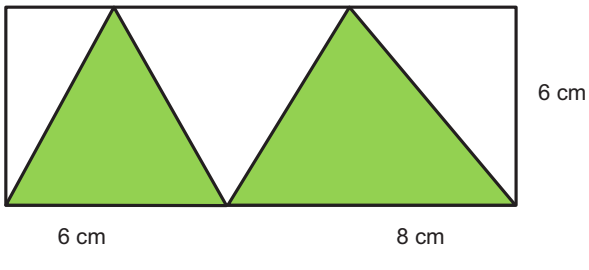
3) $S_{bs} = S_{TT} - 2(S_1 + S_2) = 65 - 2(12 + 5) = 65 - 34 = 31$

Javob: bo‘yalgan soha yuzi 31 cm^2 ga teng.

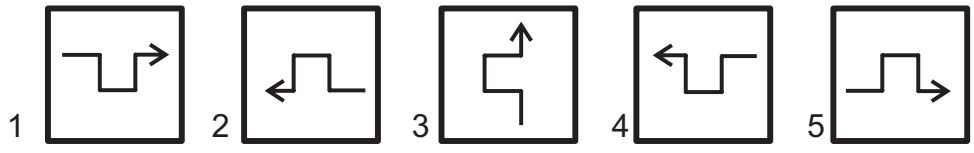
15. Quyidagi bo‘yalgan shakl yuzini hisoblang.

Ko‘rsatma: *bo‘yalgan shakl yuzini topish uchun ikkita uchburchak yuzasini hisoblab, qo‘shing.*

Javob: 42 cm^2.



16. Uchta kartochka bir xil, ular qaysilar?

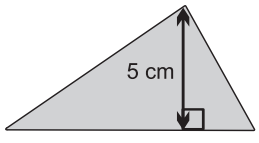


Ko‘rsatma: *kartochkalarni aylantirib ko‘ring.*

Javob: 3-kartochka, 4-kartochka va 5-kartochkalar bir xil.

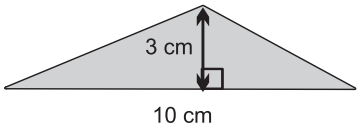
17. Uchburchaklar yuzini toping.

a



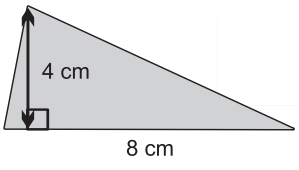
a) S = 15 cm^2

b



b) S = 15 cm^2

c

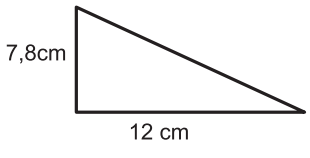


c) S = 16 cm^2

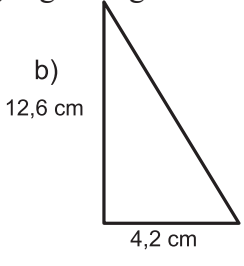
Ko‘rsatma: *yuzni topish uchun* $S = \frac{1}{2}ah$ *formuladan foydalanamiz.*

18. Quyidagi uchburchaklar ichida eng katta yuzga ega bo‘lganini aniqlang.

a)



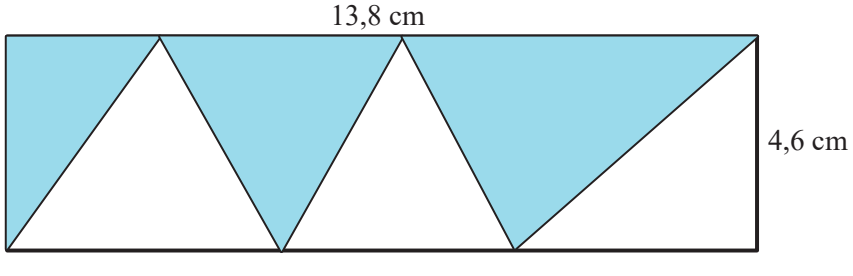
b)



a) S = 46,8 cm^2 > b) S = 26,46 cm^2

Ko‘rsatma: *yuzni topish uchun* $S = \frac{1}{2}ah$ *formuladan foydalanamiz. 3-topshiriqqa qarang.*

19. To‘g‘ri to‘rtburchakning bo‘yi va eni berilgan. Quyidagi bo‘yalgan shakl yuzini hisoblang.



Uchta uchburchak bor, ularning asoslari yig‘indisi 13,8 cm ga, hammasining balandligi 4,6 cm ga teng. Uchburchak yuzini topish formulasidan foydalanamiz: $S = \frac{1}{2}ah = \frac{1}{2} \times 13{,}8 \times 4{,}6 = 31{,}74$ cm^2. Demak, bo‘yalgan soha yuzasi 31,74 cm^2.

Katakli qog‘ozda yuzalarni hisoblash

Barcha o‘quvchilar	Katakli qog‘ozda yuzalarni hisoblash haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Katakli qog‘ozda yuzalarni hisoblashda Pik formulasini ishlata oladi.
Ba’zi o‘quvchilar	Katakli qog‘ozda yuzalarni topishda Pik formulasiga doir murakkab masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Pik formulasini yozib bering.
2. Pik formulasidagi M harfi nimani bildiradi?
3. Pik formulasidagi N harfi nimani bildiradi?
4. Uchburchak balandligi qanday burchakka tushiriladi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

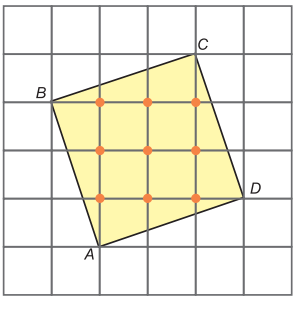
O‘quvchilar odatda shakl yuzini topishdan ko‘ra uni chizishda qiynalishadi. Pik formulasida M va N harflarining vazifasini adashtirishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuga doir savollar, tarqatmalar tayyorlashi va o‘quvchilarga mavzuni tushuntirayotganda uchburchaklarni ko‘proq chizdirishi zarur.

➢ *Uyga vazifa*

16-, 17-, 18-misollar (158-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Shaklning yuzini toping.

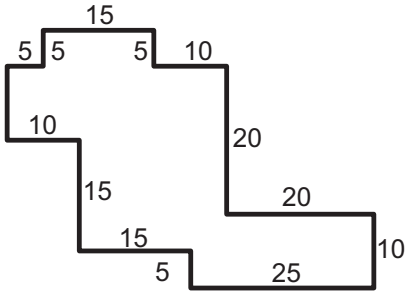


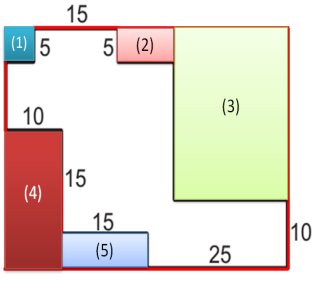
Yechish. Pik formulasidagi M va N larni rasm asosida aniqlaymiz.

M = 12; N = 9.

$$S = 9 + \frac{12}{2} - 1 = 9 + 6 - 1 = 14$$

2. Quyidagi shakl yuzini toping.





Yechish. Bo‘yalmagan shakl eni 50, bo‘yi 35 bo‘lgan to‘g‘ri to‘rtburchak yuzasidan turli rangli to‘g‘ri to‘rtburchaklar yuzlarini ayirib, topamiz.

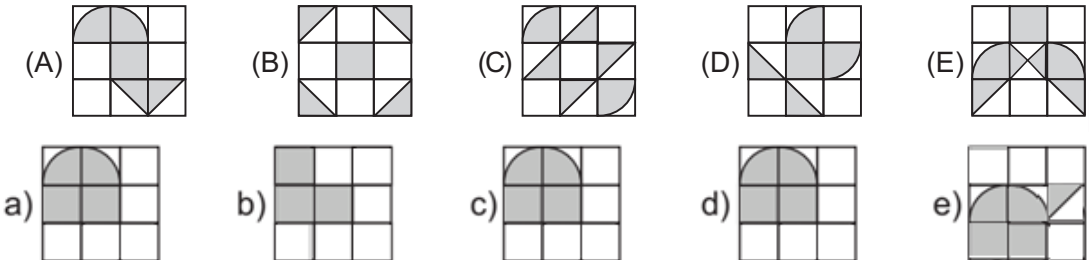
$S(1) = 5 \times 5 = 25$ $S(2) = 5 \times 10 = 50$ $S(3) = 25 \times 20 = 500$

$S(4) = 10 \times 20 = 200$ $S(5) = 15 \times 5 = 75$ $S_{TT} = 50 \times 35 = 1750$

$S_{shakl} = S_{TT} - S(1) - S(2) - S(3) - S(4) - S(5) = 1750 - 25 - 50 - 500 - 200 - 75 = 900$

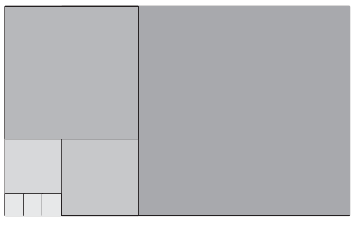
Javob: 900

3. Qaysi shaklda bo‘yalgan yuza eng kichik?

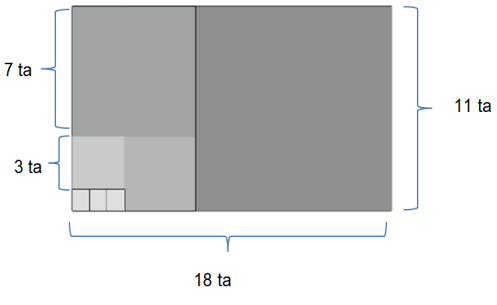


Topshiriqni bajarish uchun har bir shaklni bir-biriga to‘ldiramiz. Shakllardan eng kichigi (b) shakl, eng kattasi (e) shaklning yuzasi ekanini topamiz.

4. Katta to‘g‘ri to‘rtburchak turli o‘lchamdagi kvadratlardan tashkil topgan. Eng kichik kvadratlarning yuzi 1 ga teng. Katta to‘rtburchakning yuzi nimaga teng?

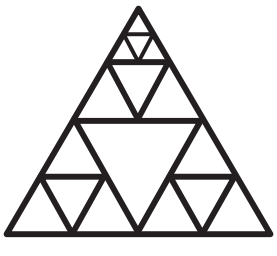


Yechish. Eng katta to‘g‘ri to‘rtburchakning tomonlarini to‘g‘ri topish talab etiladi. Bu o‘lchamlar kvadratning barcha tomonlari tengligi to‘g‘risidagi xossadan, rasmdagi eng kichik 3×1 o‘lchamli to‘g‘ri to‘rtburchak yordamida topamiz. Bunday holatda uning tomonlari 18 va 11 ekanini aniqlaymiz. Bundan yuza $S = 18 \times 11 = 198$ ekani kelib chiqadi.



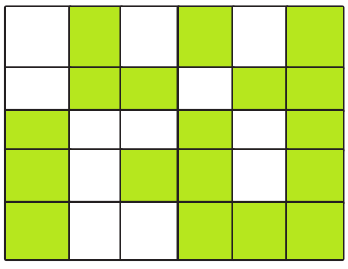
5. Rasmda nechta uchburchak bor?

Javob: 21 ta.

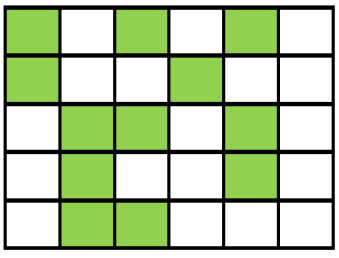


6. Harri Potterning sehrli ko‘zoynagi bor, undan foydalanganda barcha yashil ranglar oq, oq ranglar yashil bo‘lib ko‘rinadi. U shu ko‘zoynagi bilan quyidagi to‘g‘ri to‘rtburchakka qarasa, uni qanday ko‘radi?

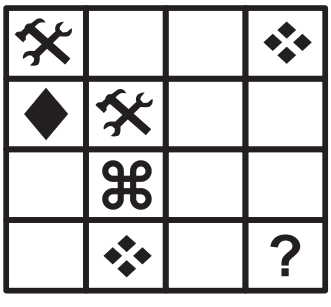
asl ko‘rinishi

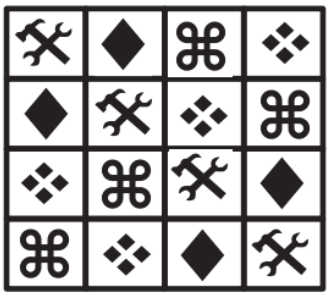


ko‘zoynakda ko‘rinishi



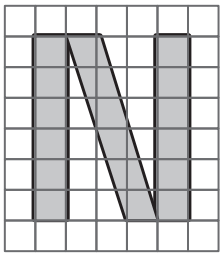
7. Sehrli shaharga kirish uchun quyidagi 4×4 jadvalni , , va belgilar bilan to‘ldiring. Har bir ustunda va har bir satrda belgilar faqat bir marta qatnashsin. So‘roq belgisi o‘rniga qanday belgi joylanadi?





Ko‘rsatma: *o‘quvchilardan boshqa holatlar bo‘lishi yoki bo‘lmasligini mustaqil tekshirishlarini so‘rang.*

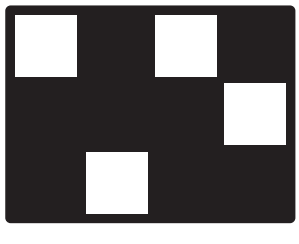
8. Agar bitta katakning yuzi 1 ga teng bo‘lsa, N harfining yuzi qancha?



Yechish. N harfining yuzini Pik formalasidan foydalanib hisoblaymiz. Shakl chegarasida yotgan nuqtalar 31 ta, ichida yotgan nuqtalar 5 ta.

$$S = \frac{31}{2} + 5 - 1 = 15{,}5 + 4 = 19{,}5$$

9. Har bir katakning yuzi 2 ga teng bo‘lsa, qora kataklar yuzi qancha?

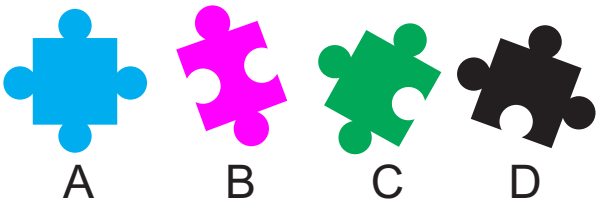


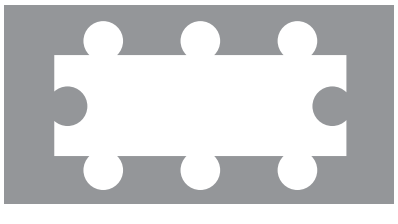
Yechish: to‘g‘ri to‘rtburchakning yuzi 12 ta katak yuzidan iborat, undan 4 ta oq katak yuzini ayiramiz.

$S = 12 \times 2 - 4 \times 2 = 24 - 8 = 16.$

Javob: 16.

10. Zeboda jumboqning to‘rtta qismi bor, ammo rasmni to‘ldirish uchun faqat uchta qism kerak. Qaysi qism ortiqcha?

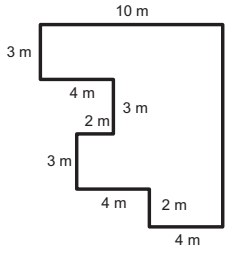




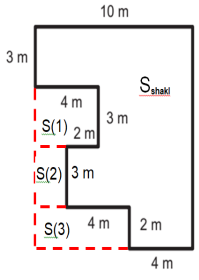
C-B-D kabi yoki D-B-C kabi qisamlarini joylashtirish mumkin. A qism ortiqcha.

11. Quyidagi shakllarning yuzlarini toping.

a)



Yechish: a) ushbu shaklni quyidagi rasm kabi to‘g‘ri to‘rtburchakka to‘ldirib olamiz. Shakl yuzini topish uchun katta to‘g‘ri to‘rtburchak yuzidan kichik to‘rtburchaklar yuzini ayiramiz.



$S_{shakl} = S_{TT} - S(1) - S(2) - S(3)$.

$S(1) = 4 \times 3 = 12$ $S(2) = 2 \times 3 = 6$ $S(3) = 2 \times 6 = 12$

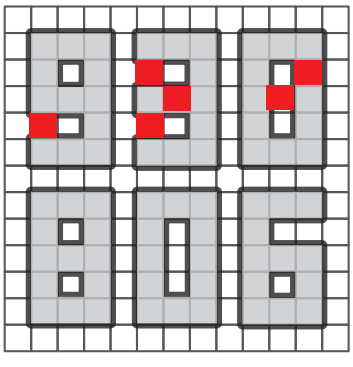
$S_{TT} = 10 \times 11 = 110$

$S_{shakl} = S_{TT} - S(1) - S(2) - S(3) = 110 - 12 - 6 - 12 = 80.$

Javob: 80 m^2.

12. Rasmda ko‘rsatilgani kabi 930 soni katakchalar yordamida yasalgan, 806 sonini yozish uchun nechta katakcha o‘z rangini almashtirishi kerak?

Javob: 6 ta katakcha (qizil rangli shakllarga qarang).

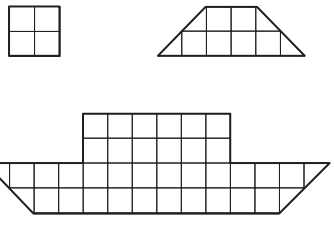


13. Rasmda berilgan har bir katak yuzi 2,2 ga teng bo‘lsa, bo‘yalgan jami yuza qancha?

Yechish: 930 ni yozish uchun 35 ta katak bo‘yalgan, bo‘yalgan yuza $S = 35 \times 2{,}2 = 77$ ga teng.

2) 806 ni yozish uchun 37 ta katak bo‘yalgan, bo‘yalgan yuza $S = 37 \times 2{,}2 = 81{,}4$ ga teng.

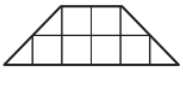
14. Akrom katakchali daftardan ikki xil turdagi shakl kesib olyapti. Akromga rasmdagi qayiqni butunlay yopish uchun kerak bo‘ladigan shakllarning eng kichik miqdori qancha?



Javob:

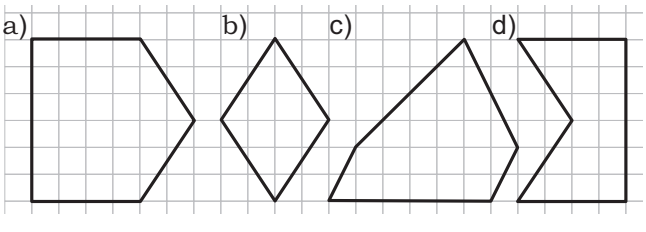


shakldan 7 ta



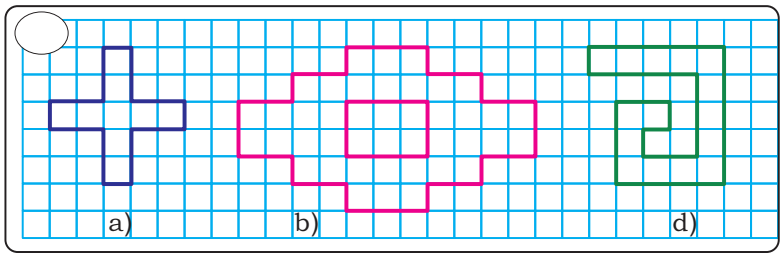
shakldan 1 ta

15. Kataklarning o‘lchami 5 × 5 (mm). Shakllarning yuzini toping.



Ko‘rsatma: *har bir shaklni uchburchak va to‘g‘ri to‘rtburchaklarga ajratib hisoblash kerak. Pik formulasidan foydalaning.*

16. Shakllarning yuzini toping.



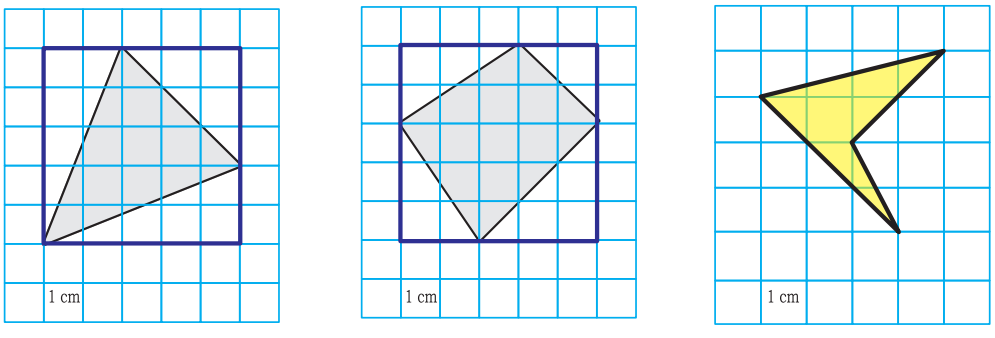
Javob:

(a) shakl 9 ta katakdan tashkil topgan. Uning yuzi $9 \times 1\ \text{cm}^2 = 9\ \text{cm}^2$.

(b) shakl 36 ta katakdan tashkil topgan. Uning yuzi $36 \times 1\ \text{cm}^2 = 36\ \text{cm}^2$.

(c) shakl 15 ta katakdan tashkil topgan. Uning yuzi $15 \times 1\ \text{cm}^2 = 15\ \text{cm}^2$.

17. Shakllarning yuzini Pik formulasidan foydalanib toping.



Yechish.

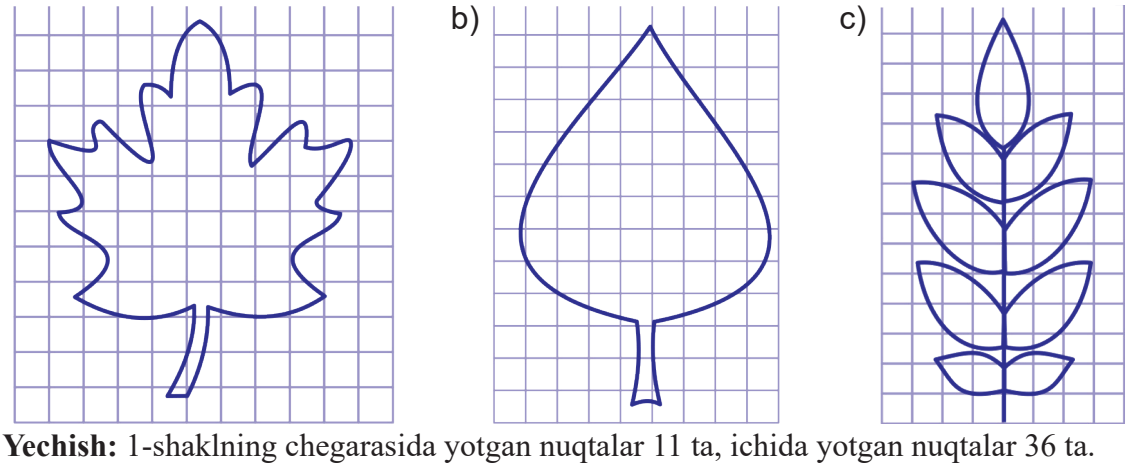
1-shakl chegarasida yotgan nuqtalar M = 15 ta, ichida yotgan nuqtalar N = 9 ta.

$S = 15 \div 2 + 9 - 1 = 15{,}5$ $S = 14 \div 2 + 10 - 1 = 16$

Javob: 1-shakl yuzi 15,5; 2-shakl yuzi 16; 3-shakl yuzi 6,5 cm^2.

18. Shakllarning yuzini toping.

a) b) c)



Yechish: 1-shaklning chegarasida yotgan nuqtalar 11 ta, ichida yotgan nuqtalar 36 ta.

$$S = \frac{11}{2} + 36 - 1 = 40{,}5\ \text{cm}^2.$$

Javob: 1-shakl yuzi 40,5 cm^2; 2-shakl yuzi 46 cm^2; 3-shakl yuzi 33 cm^2.

Aylana va doira

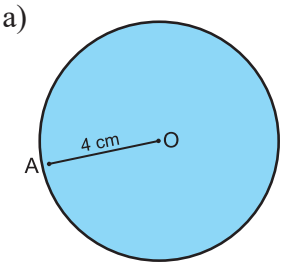
1. Hisoblashlarni tushuntiring.

A aylanadagi ixtiyoriy nuqta. Ularni tutashtirsak, *AO* kesma hosil bo‘ladi.

AO kesma aylananing radiusidir. Diametr ikkita radiusga teng. Berilgan aylananing diametri 8 cm ga teng.

Diametr = 2 × radius, radius = 4 cm, diametr = 2 × 4 = 8 cm

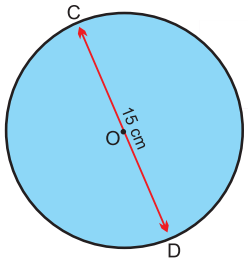
a)



O aylananing markazi, *C* va *D* aylanadagi ixtiyoriy nuqta. Ularni tutashtirsak, aylana markazidan o‘tuvchi *CD* kesma hosil bo‘ladi.

CD kesma ikkita radiusdir. *CD* kesma aylananing diametri. Berilgan aylananing radiusi 15 cm ÷ 2 = 7,5 cm ga teng.

b)



Radius = diametr ÷ 2; radius = $\frac{1}{2}$ × diametr

Diametr = 15 cm; radius = 15 ÷ 2 = 7,5 cm

2. Berilgan rasmlardan aylana va doira shakllarini toping.







Aylanaga misol **Doiraga misol**

3. Sirkul yordamida radiusi 3 cm bo‘lgan aylana yasang. Uning diametri uzunligini toping. Unda 4 cm li aylana vatarini chizing.

Ko‘rsatma: *ushbu amaliy masalani o‘quvchilar daftarda bajarishadi. Vatarning joylashuvi tahlil qilinadi. Vatar radiusdan katta, diametrdan kichikligini o‘rganishadi.*

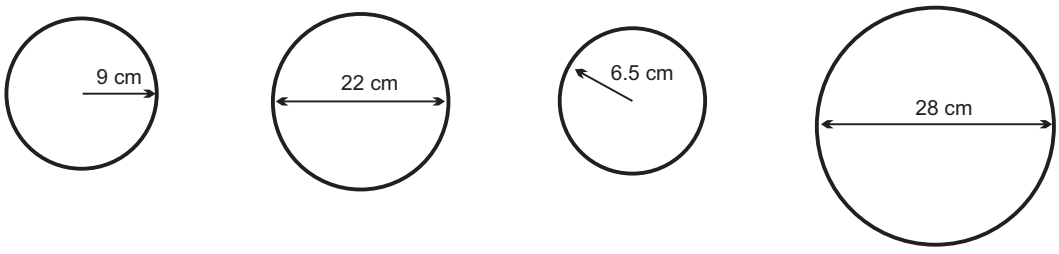
4. Atrofimizda ko‘p jismlar aylana shaklida.




Yana qanday aylanasimon buyum va narsalarni bilasiz?

Ko‘rsatma: *o‘quvchilar kundalik hayotda ko‘radigan, foydalanadigan aylana shaklidagi predmetlar, jismlarga misollar keltirishsin. Aytilgan misol doiraga tegishli bo‘lsa, xatolikni to‘g‘rilang.*

5. Aylanalarning radiusi berilgan bo‘lsa, diametrini, diametri berilgan bo‘lsa, radiusini toping.

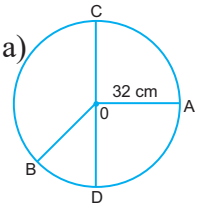


Yechish: 1-aylana radiusi 9 cm. Uning diametri 2 × 9 cm = 18 cm ga teng;
2-aylana diametri 22 cm. Uning radiusi 22 cm ÷ 2 = 11 cm ga teng;
3-aylana radiusi 6,5 cm. Uning diametri 2 × 6,5 cm = 13 cm ga teng;
4-aylana diametri 28 cm. Uning radiusi 28 cm ÷ 2 = 14 cm ga teng.

O‘quvchilarga savol bering: nega hisoblashlarda 2 sonidan keyin o‘lcham birligi qo‘yilmadi?

6. Noma’lumlarni toping.

a)

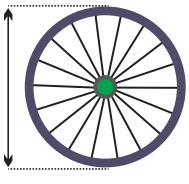


OA = 32 cm

OB = __32__ cm

CD = __64__ cm

b)

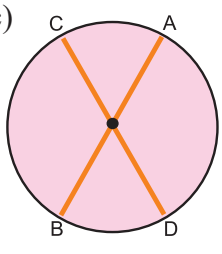


h = 60 cm

diametr = _ 60_cm

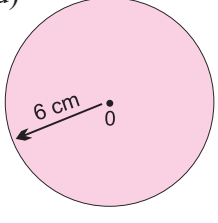
radius = _ 30_cm

c)



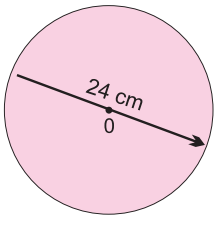
AB = 18 cm, CD = __ 18__cm

d)



Diametr =__12__cm

e)



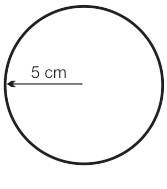
Radius =__12__cm

7. Jadvalni to‘ldiring.

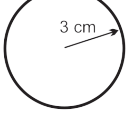
Aylana	Radius	Diametr
W	13 cm	__26__ cm
X	__6,5__ cm	13 cm
Y	__19__cm	38 cm
Z	22 cm	__44__ cm

8. Diametrlar qanchaga teng?

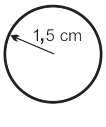
a



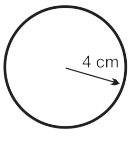
b



c

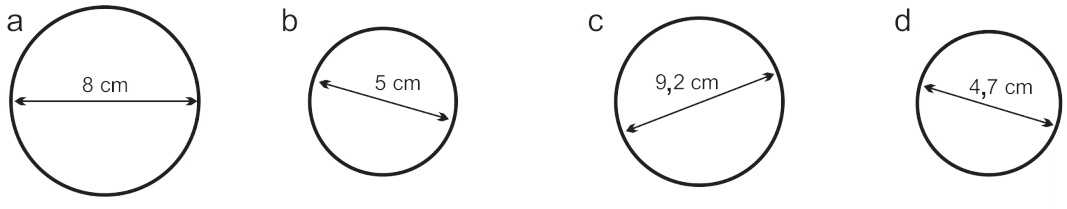


d



Yechish: *a* aylana radiusi 5 cm. Uning diametri 2 × 5 cm = 10 cm ga teng;
b aylana radiusi 3 cm. Uning diametri 2 × 3 cm = 6 cm ga teng;
c aylana radiusi 1,5 cm. Uning diametri 2 × 1,5 cm = 3 cm ga teng;
d aylana radiusi 4 cm. Uning diametri 2 × 4 cm = 8 cm ga teng.
O‘quvchilarga savol bering: nega hisoblashlarda 2 sonidan keyin o‘lcham birligi qo‘yilmadi?

9. Berilgan aylanalarning radiusini toping.

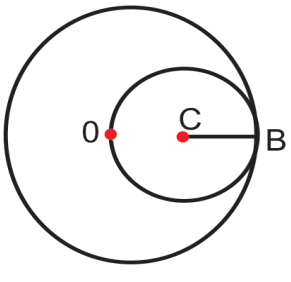


Yechish: *a* aylana diametri 8 cm. Uning radiusi: 8 cm ÷ 2 = 4 cm ga teng;
b aylana diametri 5 cm. Uning radiusi: 5 cm ÷ 2 = 2,5 cm ga teng;
c aylana diametri 9,2 cm. Uning radiusi: 9,2 cm ÷ 2 = 4,6 cm ga teng;
d aylana diametri 4,7 cm. Uning radiusi: 4,7 cm ÷ 2 = 2,35 cm ga teng.
O‘quvchilarga savol bering: nega hisoblashlarda 2 sonidan keyin o‘lcham birligi qo‘yilmadi?

10. Chizg‘ich va sirkul yordamida aylana chizing.
Radius = 4 cm Diametr = 6 cm Diametr = 8 cm Radius = 3,5 cm
Ko‘rsatma: ushbu amaliy masalani o‘quvchilar daftarda bajarishadi.

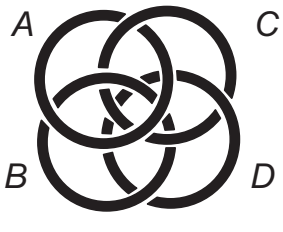
11. Berilgan rasmdan foydalanib katta aylananing diametrini toping. *CB* = 4 cm.

Yechish: avval kichik aylananing diametri topiladi, u katta aylananing radiusidir. Katta aylananing radiusi:
OB = 2 × *CB* = 2 × 4 cm = 8 cm ga teng.
Ikkita *OB* kesma uzunligi katta aylananing diametriga teng. Katta aylananing diametri:
2 × *OB* = 2 × 8 cm = 16 cm ga teng.



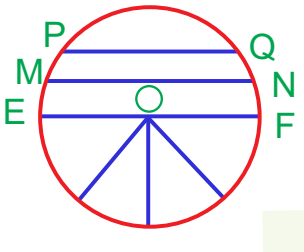
12. Qaysi halqani kesganda qolgan uchta halqa alohida bo‘lib qoladi?

Yechish: *C* halqani. Chunki u barcha halqalarning ichidan o‘tgan va ularni birlashtirib turgan halqadir.

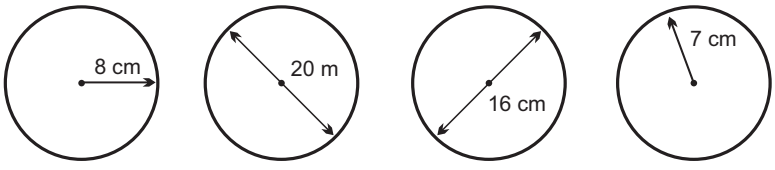


13. Quyidagi rasmda markazi *O* bo‘lgan aylana va unda chizilgan aylana elementlarini ajrating.

OA = ...*radius*
OB = ...*radius*
OC = ...*radius*
EF = ...*diametr, vatar*
MN = ...*vatar*
PQ = ...*vatar*



14. Jadvalni to‘ldiring.



Aylana	Radius	Diametr
A	8 m	16 m
B	10 m	20 m
C	8 m	16 cm
D	7 cm	14 cm

Ko‘rsatma: *yuqoridagi 5-topshiriqning yechilishidan foydalaning.*

15. Qorboboning bo‘yi uzunligini toping.

Yechish:

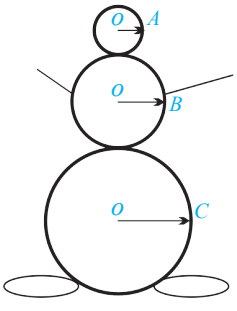
Kichik aylana diametri: $2 \times OA = 18$ cm.

O‘rtadagi aylana diametri: $2 \times OB = 28$ cm.

Pastdagi aylana diametri: $2 \times OC = 62$ cm.

Qorboboning balandligi:

18 cm + 28 cm + 62 cm = 108 cm.



$OA = 9$ cm

$OB = 14$ cm

$OC = 31$ cm

Aylana uzunligi va doiraning yuzi

Barcha o‘quvchilar	Aylana va doira haqida tushunchaga ega bo‘ladi, sirkuldan foydalanib aylana va doira chizadi.
Aksariyat o‘quvchilar	Formuladan foydalanib aylana uzunligini, radiusini, doiralarning yuzini hisoblaydi.
Ba’zi o‘quvchilar	Aylana va doiraga doir murakkab masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Pik formulasini yozing.
2. Aylana uzunligi nimaga bog‘liq?
3. Doira bilan aylananing farqi nima?
4. Doiraning yuzi formulasini ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar ko‘pincha sirkulni ishlatishda qiynalishadi. Radius bilan diametrda adashishlari mumkin. Bu holatning oldini olish uchun o‘qituvchi sirkul yordamida aylana va doirani ko‘proq chizdirishi zarur.

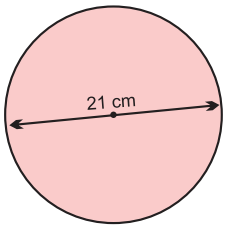
➢ *Uyga vazifa*

16-, 17-, 18-misollar (158-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

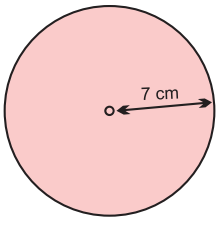
1. Hisoblashlarni tushuntiring.

a)



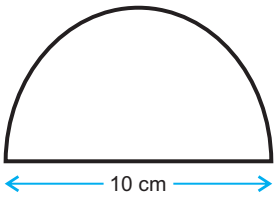
Doira aylanasi = $\pi d = \frac{22}{7} \times 21 = 66$ cm

b)



Doira aylanasi = $2\pi r = 2 \times \frac{22}{7} \times 7 = 44$ cm

c)



Yoy uzunligi $= \frac{1}{2} \times \pi d = \frac{1}{2} \times 3{,}14 \times 10 = 15{,}7$ cm

Yarim aylana perimetri = yoy uzunligi + diametr = 15,7 + 10 = 25,7 cm

2. Radiusi 5 m bo‘lgan favvora atrofi panjara bilan o‘raldi. Taxminan necha metr panjara ishlatilgan? ($\pi = 3{,}14$ deb oling).

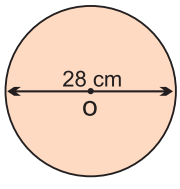
Yechish. Panjara uzunligini topish uchun aylana uzunligi formulasidan foydalanamiz. Bu yerda $R = 5$ m, $\pi = 3{,}14$. Demak, $C = 2\pi R = 2 \times 3{,}14 \times 5 = 31{,}4$ metr.

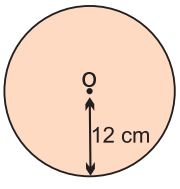
Javob: 31,4 metr.

3. Aylana uzunligi 12π ga teng. Uning diametrini toping.

Yechish. Aylana uzunligini $C = \pi d$ formulasidan, diametrni $d = \dfrac{C}{\pi}$ tenglikdan topamiz. Bundan $d = 12$ ekani kelib chiqadi.

4. O – doiraning markazi. Har bir doiraning yuzini toping. $\pi = \dfrac{22}{7}$, $\pi = 3{,}14$



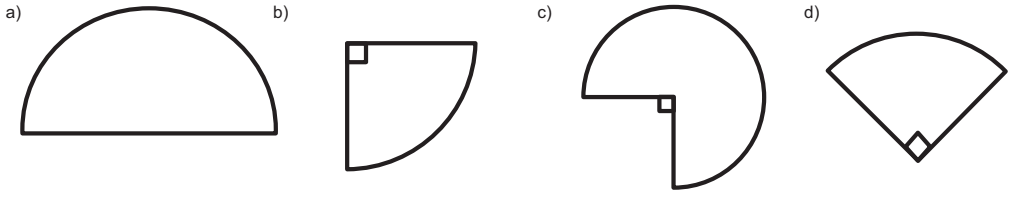


Yechish: 1-doiraning diametri 28 cm, bundan radius 14 cm ga tengligi ma’lum.

Doiraning yuzi: $S = \pi R^2 = \dfrac{22}{7} \times 14^2 = \dfrac{22}{7} \times 196 = 616 \text{ cm}^2$

2-doiraning yuzi: $S = \pi R^2 = 3{,}14 \times 12^2 = 3{,}14 \times 144 = 452{,}16 \text{ cm}^2$.

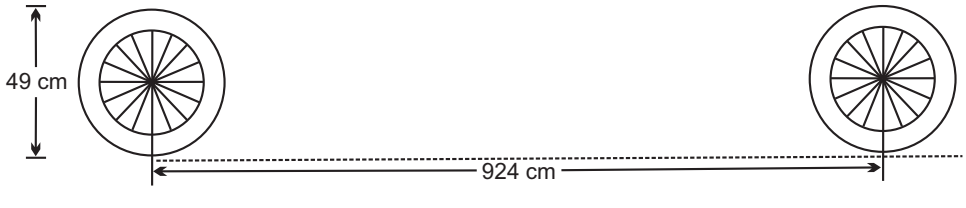
5. Doira bo‘laklarining radiusini o‘lchab, yuzini toping.



Yechish. Doira bo‘laklari yuzini topishda berilgan bo‘lak butun doiraning qanday qismini tashkil etishini bilishimiz zarur. a) radiusi R ga teng bo‘lgan doira bo‘lagining yuzi butun doira yuzining yarmi ga teng: $S = \dfrac{1}{2}\pi R^2$

b) $S = \dfrac{1}{4}\pi R^2$ c) $S = \dfrac{3}{4}\pi R^2$ d) $S = \dfrac{1}{4}\pi R^2$

6. Diametri 49 cm bo‘lgan g‘ildirak 924 cm masofani bosib o‘tdi. U necha marta to‘liq aylangan?



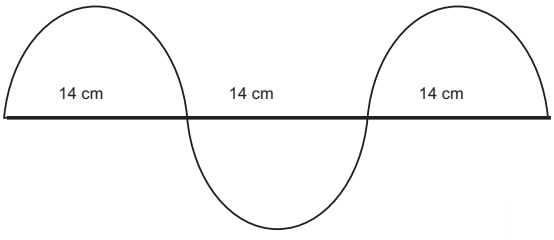
Yechish. Diametri 49 cm bo‘lgan g‘ildirak 924 cm masofani bosib o‘tishda necha marta to‘liq aylanganini topish uchun jami masofani g‘ildirak aylanasi uzunligiga bo‘lamiz.

Diametri $2R = 49$ cm ekanligi berilgan, $\pi = \dfrac{22}{7}$ deb olamiz.

1) G‘ildirak aylanasi uzunligi: $C = 2\pi R = \frac{22}{7} \times 49 = 154\,\text{cm}.$

2) 924 cm ÷ 154 cm = 6. Demak, bu masofani 6 marta aylanganda bosib o‘tadi.

7. Quyida berilgan shakldagi egri chiziq uzunligini toping. ($\pi = \frac{22}{7}$)



Yechish: $d = 2R = 14$ cm ekani ma’lum.
Egri chiziq uzunligi 1,5 ta aylana uzunligiga teng. Aylana uzunligi:

$$C = 2\pi R = \frac{22}{7} \times 14 = 44 \text{ cm}.$$

Egri chiziq uzunligi: 1,5 × 44 cm = 66 cm ga teng.

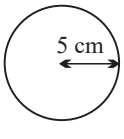
8. Doira yuzi 64π ga teng. Uning aylana uzunligini toping.
Yechish: Doira yuzi yordamida uning radiusini topib olamiz.

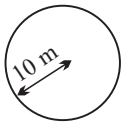
$$S = \pi R^2 \quad \Rightarrow \quad 64\pi = \pi R^2 \quad \Rightarrow \quad 64 = R^2 \quad \Rightarrow \quad R = 8$$

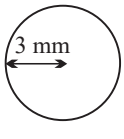
Aylana uzunligini topamiz: $C = 2\pi R = 2 \times 3{,}14 \times 8 = 50{,}24.$

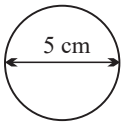
9. Doiraning radiusi 4 dm ga teng. Uning yuzini toping (π = 3,14).
Yechish: doiraning yuzini $S = \pi R^2$ formuladan topamiz.
$R = 4$ dm, $\pi = 3{,}14$. $S = \pi R^2 = 3{,}14 \times 4^2 = 50{,}24$ dm^2.

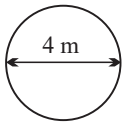
10. Doiralar yuzini hisoblang.

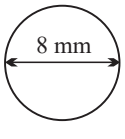
a) 

b) 

c) 

d) 

e) 

f) 

a) doiraning radiusi $R = 5$ cm. $S = \pi R^2 = 3{,}14 \times 5^2 = 78{,}5$ cm^2.

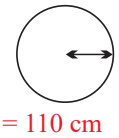
b) $S = 314$ m^2; c) $S = 28{,}26$ mm^2;

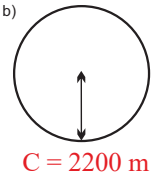
d) doiraning diametri d = 5 cm ekanidan radius R = 2,5 cm kelib chiqadi. Doiraning yuzi $S = \pi R^2 = 3{,}14 \times 2{,}5^2 = 19{,}625$ cm^2;

e) $S = 12{,}56$ m^2;

f) $S = 50{,}24$ mm^2.

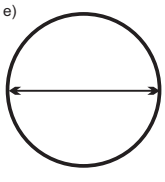
11. Noma’lum radiuslarni toping. $\pi = \frac{22}{7}$

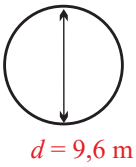
a) 
C = 110 cm

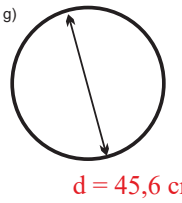
b) 
C = 2200 m

c) 
C = 22 mm

d) 
C = 154 cm

e) 
d = 25,5 cm

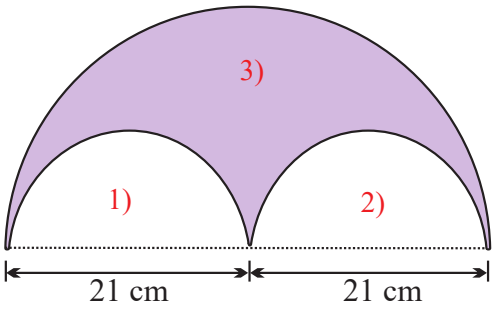
f) 
d = 9,6 m

g) 
d = 45,6 cm

Ko‘rsatma: *a, b, c, d shakllarning radiusini topish uchun $C = 2\pi R$ formuladan, e, f, g shakllarning aylana uzunligini topish uchun esa $C = \pi d$ formuladan foydalanamiz.*

12*. Quyidagi bo‘yalgan soha perimetri va yuzini toping. ($\pi = \frac{22}{7}$).

Yechish: a) bo‘yalgan soha perimetri 1–3-yarim aylanalar uzunliklari yig‘indisiga teng. Har bir yarim aylananing uzunligini topib olamiz:



1) $C_1 = \frac{1}{2}\pi d = \frac{1}{2} \times \frac{22}{7} \times 21 = 33$

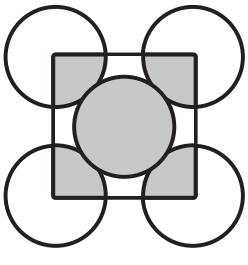
2) $C_2 = \frac{1}{2}\pi d = \frac{1}{2} \times \frac{22}{7} \times 21 = 33$

3) $C_3 = \frac{1}{2}\pi d = \frac{1}{2} \times \frac{22}{7} \times 42 = 66$

4) $C = 33 + 33 + 66 = 132$ cm. Demak, bo‘yalgan soha perimetri 132 cm ga teng.

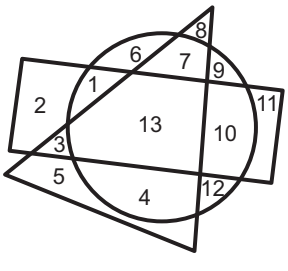
b) Yuzi katta yarim doira yuzidan ikkita kichik yarim doira yuzlari ayirmasiga teng. Hisoblashlardan so‘ng bo‘yalgan soha yuzi 346,5 cm^2 ga tengligi kelib chiqadi.

13. Quyidagi rasmda beshta aylana berilgan, har bir aylananing yuzi 2 ga teng. Kvadratning uchlari aylana markazida joylashgan bo‘lsa, bo‘yalgan soha yuzini toping.



Yechish. Rasmdan ko‘rish mumkinki, bo‘yalgan soha yuzi 2 ta butun doira yuzining yig‘indisiga teng. $R = 2$, $\pi = 3{,}14$ dan ekanidan $S = \pi R^2 = 3{,}14 \times 2^2 = 12{,}56$ kelib chiqadi. Bundan $2 \times 12{,}56 = 25{,}12$ kelib chiqadi.

14. Qaysi sonlar bir vaqtda aylana va to‘g‘ri to‘rtburchakda joylashgan, ammo uchburchakka tegishli emas?



Javoblar: aylanaga tegishli sonlar – 1; 4; 6; 7; 9; 10; 12.

Uchburchakka tegishli sonlar – 3; 4; 5; 7; 8; 13.

To‘g‘ri to‘rtburchakka tegishli sonlar – 1; 2; 3; 10; 11; 13.

Bir vaqtda aylana va to‘g‘ri to‘rtburchakda joylashgan, ammo uchburchakda joylashmagan sonlar – 1; 10.

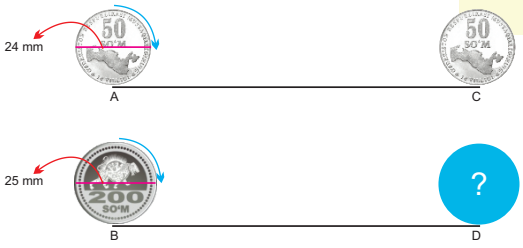
15. *A* va *B* nuqtalardagi tangalar *C* va *D* nuqtalarga aylantirildi. 50 so‘mlik tanga 10 ta to‘liq aylanishdan keyin *C* nuqtaga yetib bordi.

AC va *BD* kesmalar uzunligi bir-biriga teng bo‘lsa, 200 so‘mlik tanga aylantirilgandan keyin *D* nuqtada qanday ko‘rinishda bo‘ladi? ($\pi = 3$ deb oling.)

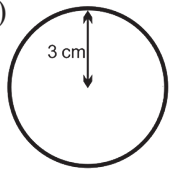
Yechish. 50 so‘mlik tanganing diametri 24 mm, radiusi 12 mm, aylanasining uzunligi $C = 2\pi R$ ga ko‘ra 72 mm. Tanga 10 marta aylansa, 720 mm = 72 cm masofani bosib o‘tadi.

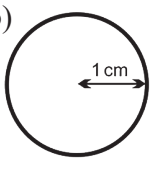
200 so‘mlik tanganing diametri $2R = 25$ mm. Aylanasining uzunligi $C = 75$ mm. Bu tanga 720 mm masofada 9 marta to‘liq aylanadi va 675 mm masofa bosib o‘tadi.

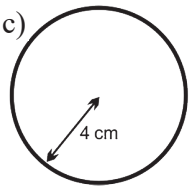
Tanga D nuqtaga borganda  ko‘rinishida bo‘ladi.

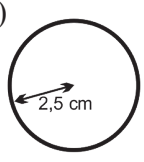


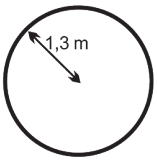
16. Doira yuzi hamda aylanasi uzunligini toping.

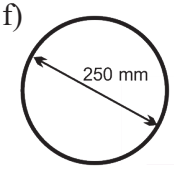
a) 

b) 

c) 

d) 

e) 

f) 

Yechish: a) doira radiusi $R = 3$ cm, aylana uzunligi: $C = 2\pi R = 2 \times 3{,}14 \times 3 = 18{,}84$ cm.
Doirasining yuzi: $S = \pi R^2 = 3{,}14 \times 3^2 = 28{,}26$ cm^2;
b) $C = 6{,}28$ cm; $S = 3{,}14$ cm^2; c) $C = 25{,}12$ cm; $S = 50{,}24$ cm^2;
d) $C = 15{,}7$ cm; $S = 19{,}625$ m^2; e) $C = 8{,}164$ m; $S = 5{,}3066$ m^2;
f) C = 785 mm; $S = 196\,250$ mm^2.

17. Dumaloq plastinkaning perimetri 132 cm, uning yuzini toping.
Javob: 1386 cm^2.

18. Agar doiraning yuzi 616 cm^2 bo‘lsa, uning perimetrini toping.
Javob: 88 cm.

19. Mototsikl g‘ildiragining diametri 63 cm. 99 km masofani bosib o‘tish uchun u necha marta aylanadi?
Javob: 50 000 marta.

20. Doiraviy maydonning radiusi 21 m, uning perimetri va yuzini toping ($\pi = \frac{22}{7}$).
Javob: 1386 m^2.

www.idum.uz saytidan yuklab olindi

Murakkab shakllarning yuzini hisoblash

Barcha o‘quvchilar	Aylana uzunligi va doira yuzi, uchburchak, to‘g‘ri to‘rtburchak yuzi haqida tushunchaga ega bo‘ladi, sirkul va chizg‘ichni ishlatishda qiynaladi.
Aksariyat o‘quvchilar	Formuladan foydalanib aylana uzunligini, radiusini, doira, uchburchaklar yuzini hisoblay oladi.
Ba’zi o‘quvchilar	Murakkab shakllarning yuzalariga doir murakkab masalalarni yechadi.

➢ *Faollashtiruvchi savol va topshiriqlar*

1. Uchburchak yuzi formulasini yozing.
2. Aylana uzunligi nimaga bog‘liq?
3. Doira yuzi bilan aylana uzunligining farqi nimada?
4. Radius, vatar va diametrning farqi nimada?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

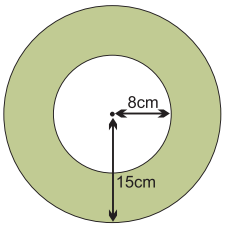
O‘quvchilar odatda sirkul ishlatishda qiynaladi. Murakkab shakllarning yuzalarini topishda formulalardan foydalanishda, tassavur qilishda qiyinchilikka uchraydi. Bu holatning oldini olish uchun o‘qituvchi savollar, tarqatmalar tayyorlashi, o‘quvchilarga aylana va uchburchaklarni ko‘proq chizdirishi zarur.

➢ *Uyga vazifa*

13-, 14-, 15-misollar (168-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Katta doira radiusi 15 cm. Kichikroq doiraning radiusi 8 cm. bo‘yalgan sohaning yuzi qancha? ($\pi = 3{,}14$)

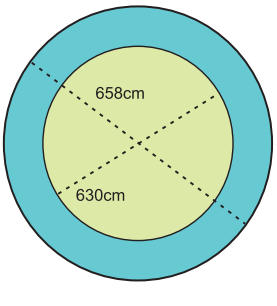


Katta doira yuzi $S = \pi \times r^2 = 3{,}14 \times 15 \times 15 = 705{,}5$ cm^2.

Kichik doira yuzi $S = \pi \times r^2 = 3{,}14 \times 8 \times 8 = 200{,}96$ cm^2.

Bo‘yalgan sohaning yuzi $S = 706{,}5 - 200{,}96 = 505{,}54$ cm^2.

2. Aylanma yo‘lning ichki va tashqi diametri berilgan. Aylanma yo‘lning maydonini toping ($\pi = \frac{22}{7}$).



Yechish: aylanma yo‘lning ichki diametri $d = 630$ cm, tashqi diametri $D = 658$ cm. Bundan $r = 315$ cm, $R = 329$ cm kelib chiqa-

di. Aylanma yo‘lning maydoni (yuzasi) tashqi doira yuzidan ichki doira yuzining ayirmasiga teng.

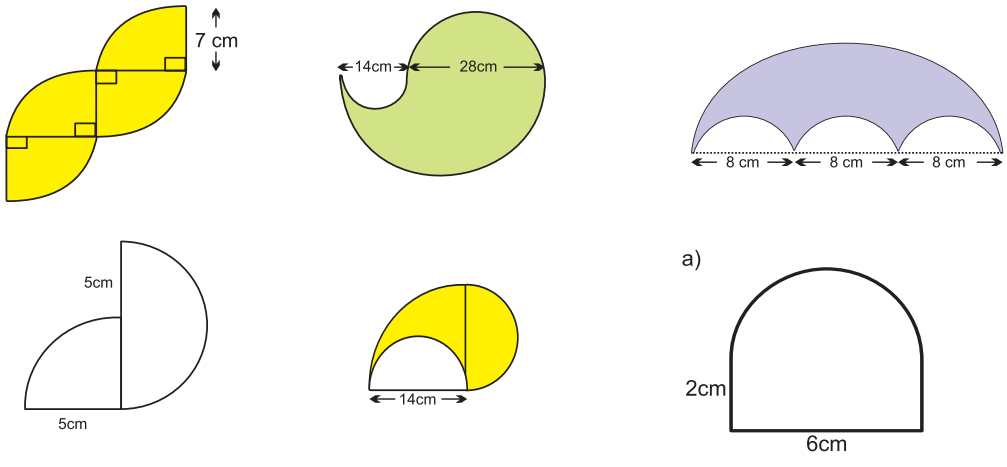
Kichik doira yuzi: $S = \pi r^2 = \frac{22}{7} \times 315^2 = \frac{22}{7} \times 99\,225 = 311850 \text{ cm}^2$.

Katta doira yuzi: $S = \pi R^2 = \frac{22}{7} \times 329^2 = \frac{22}{7} \times 108\,241 = 340186 \text{ cm}^2$.

Aylanma yo‘lning maydoni (yuzasi):

$S_{katta} - S_{kichik}$ = 340 186 – 311 850 = 28 336 cm^2 ga teng.

3. Berilgan shakllarning yuzini toping.



Yechish: 1-shakl radiusi 7 cm ga teng doirani to‘rtta qismga teng bo‘lib, joylashuvi o‘zgartirilgan holatdir. 4 ta qism 1 ta butun doirani hosil qiladi. Demak, 1 ta doira yuzini topsak, berilgan shakl yuzini topish mumkin:

$$S = \pi R^2 = \frac{22}{7} \times 7^2 = \frac{22}{7} \times 49 = 154 \text{ cm}^2.$$

2-bo‘yalgan sohaning yuzi diametri 14 + 28 = 42 cm li va diametri 28 cm li yarim doiralar yuzlarining yig‘indisidan diametri 14 cm li yarim doira yuzining ayirmasiga teng.

$$S = \frac{1}{2} \times \frac{22}{7} \times \left(\frac{42}{2}\right)^2 + \frac{1}{2} \times \frac{22}{7} \times \left(\frac{28}{2}\right)^2 - \frac{1}{2} \times \frac{22}{7} \times \left(\frac{14}{2}\right)^2 =$$

$$= \frac{1}{2} \times \frac{22}{7} \times \left(21^2 + 14^2 - 7^2\right) = \frac{11}{7} \times (441 + 196 - 49) = 924 \text{ cm}^2$$

Qolgan shakllar yuzi ham shu tartibda topiladi.

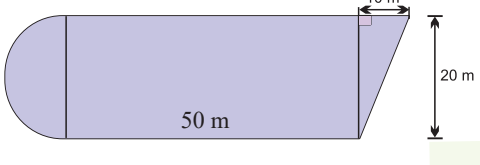
4. Quyidagi shaklning yuzini toping.

Yechish. Shaklning yuzini bo‘laklarga ajratib topamiz.

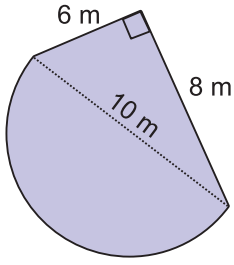
Yarim doira yuzi + to‘g‘ri to‘rtburchak + to‘g‘ri burchakli uchburchak = shakl yuzi

$$S = \frac{1}{2} \times 3{,}14 \times 10^2 + 50 \times 20 + \frac{1}{2} \times 10 \times 20 =$$

$$= 157 + 1\,000 + 100 = 1\,257 \text{ m}^2$$



5. To‘g‘ri burchakli uchburchak va yarim aylanadan iborat shaklning perimetri va yuzini toping ($\pi = 3{,}14$).



Yechish: yarim doira diametri 10 m, radiusi $R = 5$ m, π=3,14. To‘g‘ri burchakli uchburchak tomonlari 6 m, 8 m va 10 m.

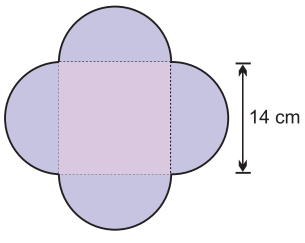
1) Perimetri doira aylanasining yarmi bilan to‘g‘ri burchakli uchburchakning 6 m va 8 m li tomonlari yig‘indisidan iborat:

$$P = \frac{1}{2} \times 2 \times 3{,}14 \times 5 + 6 + 8 = 29{,}7 \text{ m}.$$

2) Yuzi yarim doira yuzi bilan to‘g‘ri burchakli uchburchak yuzining yig‘indisidan iborat:

$$S = \frac{1}{2} \times 3{,}14 \times 5^2 + \frac{1}{2} \times 6 \times 8 = 39{,}25 + 24 = 63{,}25 \text{ m}^2.$$

6. Quyidagi shakl perimetrini va yuzini toping ($\pi = \frac{22}{7}$).



Yechish.

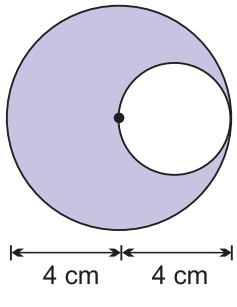
1) Berilgan shakl diametri $2R = 14$ cm ga teng bo‘lgan ikkita doira aylanasining bo‘laklaridan iborat. Perimetri esa radiusi $R = 7$ cm ga teng ikkita aylana uzunliklari yig‘indisiga teng.

$$P = 2\left(2 \times \frac{22}{7} \times 7\right) = 2 \times 44 = 88 \text{ cm}.$$

2) Berilgan shaklning yuzi diametri $2R = 14$ cm ga teng ikkita doira yuzi bilan tomoni 14 cm ga teng kvadrat yuzining yig‘indisidan iborat.

$$S = 2 \times \frac{22}{7} \times 7^2 + 14^2 = 308 + 196 = 504 \text{ cm}^2$$

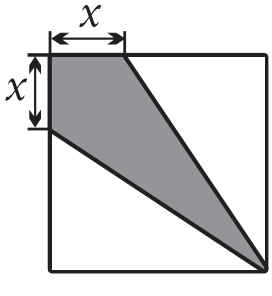
7. Shakl ikkita aylana bilan berilgan. Bo‘yalgan soha yuzini toping ($\pi = 3{,}14$).



Yechish. Bo‘yalgan shakl yuzi radiusi $R = 4$ cm ga teng katta doira yuzidan diametri $2r = 4$ cm ga teng kichik doira yuzining ayirmasiga teng.

$S = \pi R^2 - \pi r^2 = 3{,}14 \times 4^2 - 3{,}14 \times 2^2 = 37{,}68 \text{ cm}^2$.

8*. Kvadratning tomoni 6 cm ga teng, $x = 2$ cm. Bo‘yalgan sohaning yuzini toping.

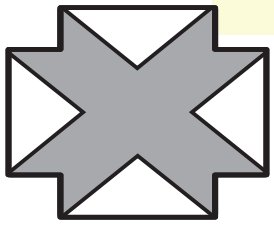


Yechish: bo‘yalgan sohaning yuzi tomoni 6 cm bo‘lgan kvadrat yuzidan ikkita to‘g‘ri burchakli uchburchak yuzlarining ayirmasiga teng. Kvadrat tomoni $a = 6$ cm, to‘g‘ri burchakli uchburchak tomonlari $a = 6$ cm va $b = a - x = 6 - 2 = 4$ cm.

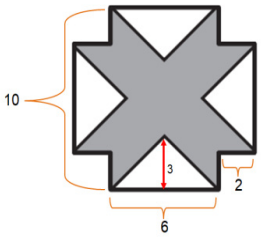
$$S = a^2 - 2 \times \frac{1}{2} \times (a - x) \times a = 6^2 - 2 \times \frac{1}{2} \times 4 \times 6 = 36 - 24 = 12 \text{ cm}^2.$$

O‘quvchilar bilan boshqa usul yordamida ham bajarib ko‘ring.

9*. 10×10 kvadratning burchaklaridan 2×2 kvadratchalar qirqib olingan. Ushbu shakldagi bo‘yalgan bo‘lakning yuzini toping.



Yechish. Bo‘yalgan sohaning yuzi tomoni 10 ga teng kvadrat yuzidan asosi 6 ga, balandligi 3 ga teng to‘rtta uchburchak va tomoni 2 ga teng to‘rtta kvadratning yuzi ayirmasiga teng.



$$S = 10^2 - 4 \times \frac{1}{2} \times 6 \times 3 - 4 \times 2^2 = 100 - 36 - 16 = 48$$

Javob: 48.

10. Poyga yo‘li halqa shaklida bo‘lib, ichki aylanasi 220 m, tashqi aylanasi 308 m. Yo‘lning kengligini toping.

Yechish: yo‘lning kengligini topish uchun katta halqani hosil qilgan doira yuzidan kichik halqani hosil qilgan doira yuzini ayiramiz.

Katta halqa radiusini topamiz. $C = 308$ m.

$$C = 2\pi R \Rightarrow 308 = 2 \times \frac{22}{7} \times R \Rightarrow R = 308 \times \frac{7}{44} = 49$$

Kichik halqa radiusini topamiz. $C = 220$ m.

$$C = 2\pi r \Rightarrow 220 = 2 \times \frac{22}{7} \times r \Rightarrow r = 220 \times \frac{7}{44} = 35$$

Halqa yuzini topamiz:

$$S = \pi R^2 - \pi r^2 = \pi\left(R^2 - r^2\right) = \frac{22}{7} \times \left(49^2 - 35^2\right) = \frac{22}{7} \times 1176 = 3\ 696\ \text{m}^2.$$

11*. To‘g‘ri to‘rtburchak 7 ta kvadratdan tashkil topgan. Qora rangdagi kvadratning tomoni 1 ga teng, kulrang kvadratning tomoni 3 ga teng. A kvadratning yuzini toping.

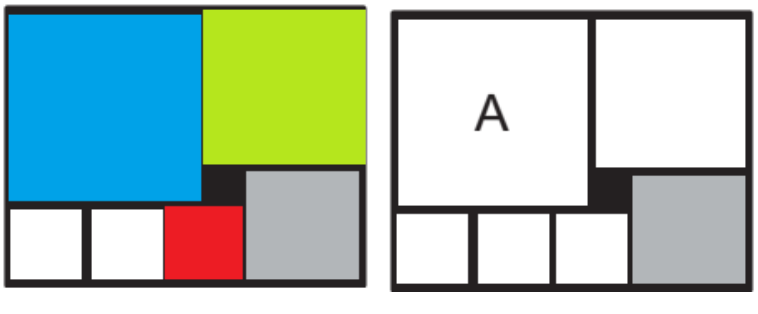
Yechish:

1) qora rangli kvadrat tomoni 1 ga teng;

2) qizil rangli kvadrat tomoni kulrang kvadrat tomonidan qora kvadrat tomonining ayirmasiga, ya’ni 2 ga teng;

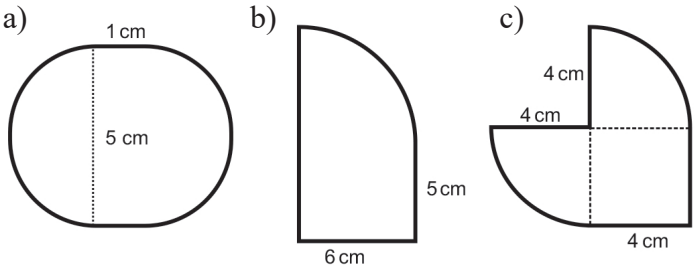
3) yashil kvadrat tomoni kulrang va qora kvadrat tomonlar yig‘indisiga teng, ya’ni 4 ga;

4) ko‘k (A) kvadrat tomoni yashil va qora kvadrat tomonlar yig‘indisiga teng, ya’ni 5 ga. Uning yuzi $S = 5^2 = 25$ ga teng.



12. Berilgan shakllarning yuzini toping.

a) b) c)



Yechish. Berilgan shakllar yuzini topish uchun uni bo‘laklarga bo‘lib, hosil bo‘lgan bo‘laklar yuzlarini qo‘shamiz.

a) shaklning yuzi diametri 2R = 5 cm bo‘lgan doira va tomonlari 5 cm va 1 cm bo‘lgan to‘g‘ri to‘rtburchak yuzlarining yig‘indisiga teng. Bu yerda π = 3,14 ga teng.

$$S = \pi R^2 + ab = 3{,}14 \times (2{,}5)^2 + 5 \times 1 = 3{,}14 \times 6{,}25 + 5 = 24{,}625\ \text{cm}^2.$$

b) shakl yuzi 58,26 cm^2; c) shakl yuzi 41,12 cm^2.

13. Quyidagi shakl yuzini toping.

Yechish. Berilgan shakl yuzini topish uchun uni bo‘laklarga bo‘lib, hosil bo‘lgan bo‘laklar yuzlarini qo‘shamiz.

Bu shaklda ikkita teng to‘g‘ri burchakli uchburchak va uchta to‘g‘ri to‘rtburchak bor. Ularning yuzlarini topib, qo‘shamiz.

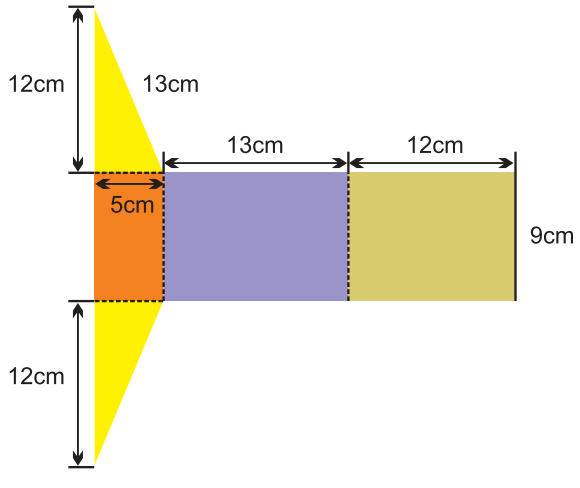
1) $2S_{\Delta} = 2 \times \frac{1}{2} \times 12 \times 5 = 60$

2) $S_1 = 5 \times 9 = 45$

3) $S_2 = 13 \times 9 = 117$

4) $S_3 = 12 \times 5 = 60$

Shakl yuzi: $S = 2S_{\Delta} + S_1 + S_2 + S_3 = 60 + 45 + 117 + 60 = 282$ cm^2.



Fazoviy shakllarning hajmi

Barcha o‘quvchilar	Fazoviy shakllarning hajmi haqida tushunchaga ega bo‘ladi, sirkul va chizg‘ichni ishlatishda qiynaladi, sodda fazoviy shakllarning hajmini topa oladi.
Aksariyat o‘quvchilar	Doira, uchburchaklar yuzi formulasidan foydalanib fazoviy shakllarning hajmini hisoblay oladi.
Ba’zi o‘quvchilar	Fazoviy shakllarning hajmiga doir murakkab masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Parallelepiped hajmi formulasini yozib bering.
2. Hajm qanday o‘lchamlarga bog‘liq?
3. Hajm bilan yuza o‘lchov birliklarining farqi nimada?
4. Kub bilan parallelepipedning farqi nimada?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar ko‘pincha sirkulni ishlatishda, murakkab shakllarning yuzasini topishda esa formulalardan foydalanish va tassavur qilishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda katak qog‘ozga chizgan holda taqdimotlar qilish kerak, mavzuga doir savollar, tarqatmalar tayyorlashi, o‘quvchilarga aylana va uchburchaklarni ko‘proq chizdirishi zarur.

➢ *Uyga vazifa*

8-, 9-, 10-misollar (171-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Fazoviy jismlarning hajmini toping.

Yechish. Fazoviy jismlarning hajmini topish uchun ikkita kuboid sifatidagi hajmlarini topib, qo‘shamiz.

Kuboidning hajmi uning bo‘yi, eni va balandligi ko‘paytmasiga teng. Chapdagi jism hajmi:

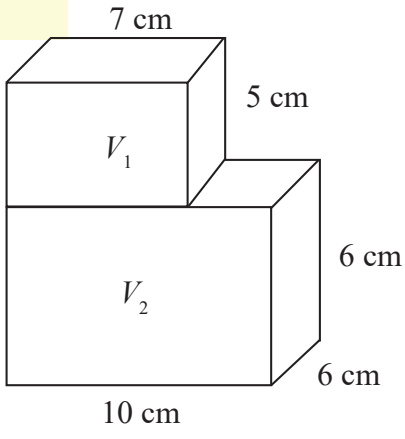
1) kichik kuboid:

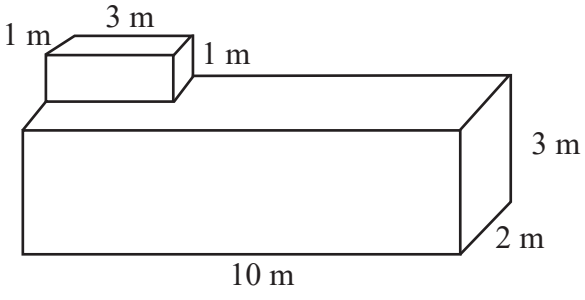
$a = 7$ cm, $b = 6$ cm, $c = 5$ cm. $V_1 = 7 \times 6 \times 5 = 210$ cm^3.

2) katta kuboid:

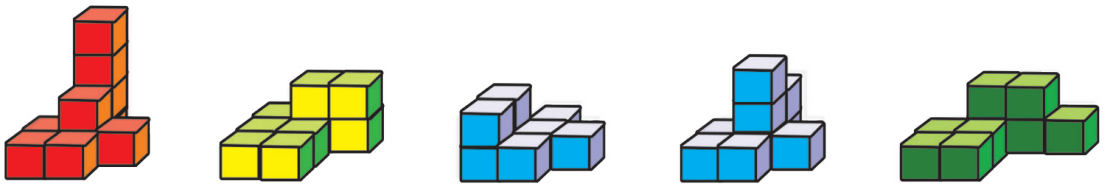
$a = 10$ cm, $b = 6$ cm, $c = 6$ cm. $V_2 = 10 \times 6 \times 6 = 360$ cm^3.

3) Umumiy shakl hajmi: $V = V_1 + V_2 = 210 + 360 = 570$ cm^3.





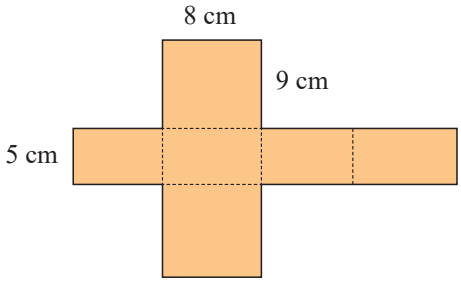
2. Har bir kubning hajmi 1 birlikka teng bo‘lsa, jismlarning hajmini toping.



1) 10 2) 9 3) 8 4) 9 5) 9

Yechish. Jismlarning hajmi ularda qatnashgan kublar soniga ko‘ra topiladi.
1-shaklda 10 ta kub bor. Uning hajmi 10 ga teng.

3. Qirqimdan qaysi fazoviy shaklni yasash mumkin? Uning to‘la sirt yuzi va hajmini toping.



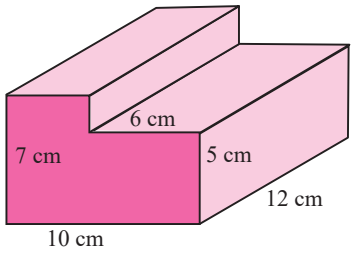
Yechish. Rasmga ko‘ra qirqimdan kuboid yasash mumkin. O‘lchamlari: a =8 cm, b = 5 cm, c = 9 cm.

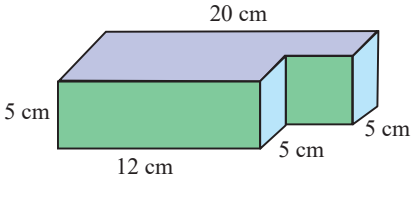
Uning to‘la sirti yuzi:

$S = 2\times(ab \times ac \times bc) = 2 \times (8\times5 + 8\times9 + 5\times9) = 314$ cm^2.

Hajmi: $V = a\times b\times c = 8\times5 \times9 = 360$ cm^3.

4. Fazoviy jismlarning hajmini toping.



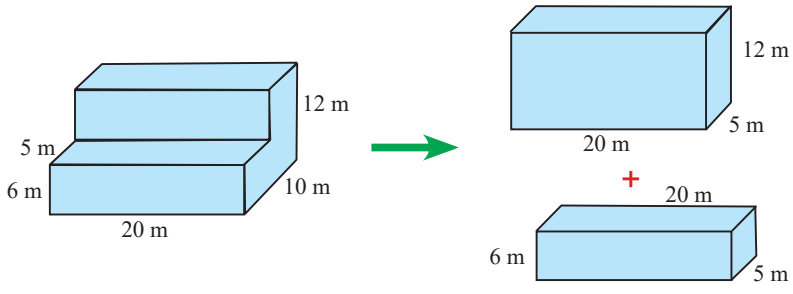


Yechish: 1) a = 12 cm, b = 10 cm, c = 5 cm bo‘lgan kuboidga a = 12 cm, b = 4 cm, c = 2 cm bo‘lgan kuboidning hajmini ayirish orqali javobini topamiz.

Hajmi: $V = V_1 - V_2 = 12 \times 10 \times 5 + 12 \times 4 \times 2 = 600 + 96 = 696$ cm^3.

2) fazoviy shakl hajmi 800 cm^3.

5. Fazoviy jismlarning hajmini taqqoslang.



Yechish: 1) $a = 20$ m, $b = 10$ m, $c = 12$ m bo‘lgan to‘la kuboiddan $a = 20$ m, $b = 5$ m, $c = 6$ m bo‘lgan kuboidning hajmini qo‘shish orqali javobni topamiz.

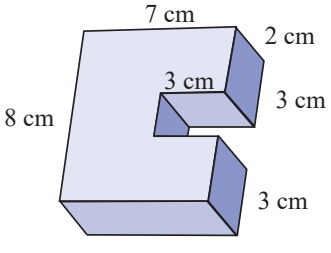
$V = V_1 - V_2 = 20 \times 12 \times 10 - 20 \times 5 \times 6 = 2400 - 600 = 1800$ m^3.

2) O‘lchamlari $a = 20$ m, $b = 5$ m, $c = 12$ m bo‘lgan kuboidga o‘lchamlari $a = 20$ m, $b = 5$ m, $c = 6$ m bo‘lgan kuboid hajmini qo‘shamiz.

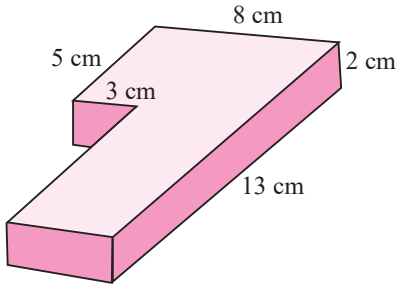
$V = V_1 + V_2 = 20 \times 5 \times 12 + 20 \times 5 \times 6 = 1200 + 600 = 1800$ m^3.

Demak, ularning hajmi teng.

6. Fazoviy jismlarning hajmini toping.

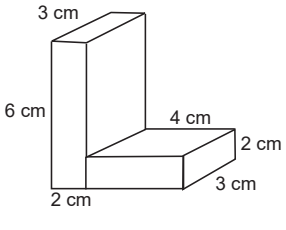


$V_1 = a \times b \times c = 7 \times 8 \times 2 = 112$ cm^3.
$V_2 = a \times b \times c = 3 \times 2 \times 2 = 12$ cm^3.
$V = V_1 - V_2 = 112 - 12 = 100$ cm^3.

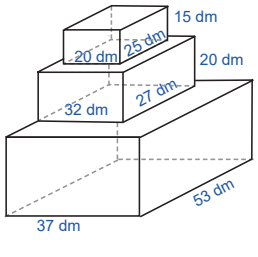


$V_1 = a \times b \times c = 13 \times 8 \times 2 = 208$ cm^3.
$V_2 = a \times b \times c = 8 \times 3 \times 2 = 48$ cm^3.
$V = V_1 - V_2 = 208 - 48 = 160$ cm^3.

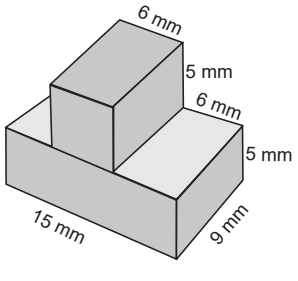
7. Fazoviy jismlarning hajmini toping.



1) shakl hajmi: 60 cm^3



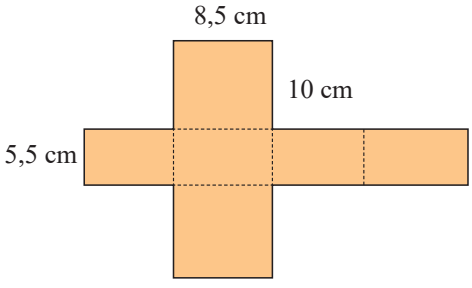
2) shakl hajmi: 83 610 dm^3



3) shakl hajmi: 945 mm^3

8. Qirqimdan qaysi fazoviy shaklni yasash mumkin? Uning to‘la sirti yuzi va hajmini toping.

Rasmga ko‘ra qirqimdan kuboid fazoviy shaklini yasash mumkin. Uning o‘lchamlari: $a = 8{,}5$ cm, $b = 5{,}5$ cm, $c = 10$ cm.

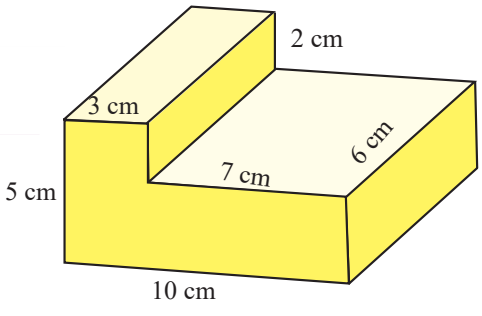


Uning to‘la sirti yuzi:

$S = 2 \times (ab \times ac \times bc) = 2 \times (8{,}5 \times 5{,}5 + 8{,}5 \times 10 + 5{,}5 \times 10) = 373{,}5$ cm^2.

Hajmi: $V = a \times b \times c = 8{,}5 \times 5{,}5 \times 10 = 467{,}5$ cm^3.

9. Fazoviy jismning hajmini toping.



Yechish. Fazoviy jismning hajmini topish uchun uni ikkita kuboid sifatidagi hajmlarini topib, qo‘shamiz.

Kuboidning hajmi uning bo‘yi, eni va balandligi ko‘paytmasiga teng. Chapdagi jism hajmi:

1) kichik kuboid:

$a = 3$ cm, $b = 6$ cm, $c = 2$ cm. $V_1 = 3 \times 6 \times 2 = 36$.

2) katta kuboid: $a = 10$ cm, $b = 6$ cm, $c = 3$ cm.

$V_2 = 10 \times 6 \times 3 = 180$.

3) Umumiy shakl hajmi: $V = V_1 + V_2 = 36 + 180 = 216$ cm^3.

10. Rasmdagi jihozlarning hajmini uyda mustaqil o‘lchashlar o‘tkazib toping.



Ko‘rsatma: *o‘quvchilar uylarida ushbu jihozlarni mustaqil o‘lchab, hajmini topib kelishadi.*

O‘lchov birliklari orasidagi munosabatlar

Barcha o‘quvchilar	O‘lchov birliklari orasidagi munosabatlar haqida tushunchaga ega bo‘ladi, sodda o‘lchov birliklari orasidagi munosabatlarni bajara oladi.
Aksariyat o‘quvchilar	O‘lchov birliklari orasidagi munosabatlarni yaxshi tushunadi, ularga doir misollarni yecha oladi.
Ba’zi o‘quvchilar	O‘chov birliklari orasidagi munosabatlarga doir murakkab masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. 1000 cm necha metr? Hajm qanday o‘lchamlarga bog‘liq?
2. 1:30 soatda necha minut bor?
3. 175 minutni soatga aylantiring.
4. 16 soat sutkaning necha qismi bo‘ladi?
5. Sutkaning sakkizdan bir qismi necha soat?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda o‘nli kasrda berilgan o‘lchov birliklarini boshqa o‘lchov birligiga o‘tkazishda qiynalishadi. Bu holatning oldini olish uchun o‘nli kasrni 10 ga, 100 ga, 1000 ga ko‘paytirish va bo‘lish qoidalarini eslating. Vaqt o‘lchov birligi bilan bog‘liq almashtirishlarda 60 ga, 24 ga, 3600 ga bo‘lishga doir misollar bilan mustahkamlang.

➢ *Uyga vazifa*

15-misol (174-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Metr va santimetrda ifodalang.

a) 6,13 m = 6,13 × 100 = 613 cm

b) 16,01 m = 16,01 × 100 = 1601 cm

c) 7,1 m = 7,1 × 100 = 710 cm

2. Bo‘sh joylarni to‘ldiring.

a) 0,6 m = 60 cm b) 0,615 km = 615 m c) 1,85 cm = 18,5 mm

d) 2,5 m= 250 cm e) 85,5 m = 8550 cm f) 0,85 m = 85 cm

3. Kilogrammda ifodalang va o‘nli kasr ko‘rinishida yozing.

a) 5 kg 813 g = 5,813 kg b) 457 g = 0,457 kg c) 2307 g = 2,307 kg

d) 7 kg 97 g = 7,097 kg e) 1 kg 2 g = 1,002 kg f) 14 835 g = 14,835 kg

4. Tonna va kilogrammlarda ifodalang.

a) 2,783 t = 2 t 783 kg b) 45,01 t = 45 t 10 kg c) 25,019 t = 25 t 19 kg

5. Minutlarda ifodalang.

a) 0,2 h = 12 min b) 0,5 h = 30 min c) 0,25 h = 15 min d) 1,5 h = 90 min

6. Ifodalang.

a) metrda: 3,25 km = 3250 m; 0,042 km; 18,5 dm; 250 cm; 0,7 cm; 62 mm.

b) kilogrammda: 0,5 t = 500 kg; 1,5 t; 500 g; 1500 g; 0,8 t; 28,7 t.

c) soatda: 0,5 d = 12 h; 4 d; 50 m, 30 m; 90 m; 0,5 m; 128 s.

7. Jadvalni to‘ldiring.

Metr	Santimetr	Millimetr
0,001	0,1	1
0,01	1	10
0,0345	3,45	34,5
0,507	50,7	507
0,75	75	750
0,855	85,5	855
10,3	1 030	10 300
150	15 000	150 000

Kilogramm	Gramm	Milligramm
0,0005	0,5	500
0,00085	0,85	850
0,00022	0,22	220
0,000325	0,325	325
0,050	50	50 000
0,750	750	750 000
22,5	22 500	22 500 000
175,5	175 500	175 500 000

8. Miqdorlarni taqqoslang.

a) 324,17 kg > 320,78 kg b) 1200 kg < 1643,3 kg

c) 98,52 m > 65,39 m d) 1272 m < 13 888 m e) 23,5 °C > 13,59 °C

9. Jadvalda 3 nafar o‘g‘il bolaning bo‘yi metrda ko‘rsatilgan. Balandliklarni santimetrda ifodalang.

Ism	Bo‘yi
Samir	1,4
Rasul	1,26
Maqsud	1,32

Ism	Bo‘yi	
Samir	1,4 m	140 cm
Rasul	1,26 m	126 cm
Maqsud	1,32 m	132 cm

10. Sherali maktablararo 1 kilometrlik poygada yugurmoqda. Agar u 2 m/s tezlikda yugursa, marraga yetish uchun qancha vaqt ketadi?

Yechish: $S = 1000$ m, $v = 2$ m/s, $t = ?$

$S = v \times t$ masofa, tezlik va vaqt orasidagi bog‘lanish ifodasidan t ni topamiz: $t = S \div v$.

$t = 1000 \div 2 = 500$ sekund $= 8$ m 20 s.

Demak, Sherali belgilangan masofani 500 sekund = 8 m 20 s da bosib o‘tar ekan.

11. A va B shaharlari bir-biridan 11,8 km, C va D shaharlari bir-biridan 11500 metr masofada joylashgan bo‘lsa, qaysi shaharlar o‘rtasida ko‘proq masofa bor?

Yechish. A va B shaharlari bir-biridan 11,8 km, C va D shaharlari bir-biridan 11500 metr masofada joylashgan bo‘lsa, qaysi shaharlar o‘rtasida ko‘proq masofa borligini quyidagi taqqoslash orqali topamiz.

A dan B gacha 11,8 km = 11 800 m > C dan D gacha 11 500 m

12. Futbol maydoni aynan 1,32 ha o‘lchamga ega. U necha kvadrat metrni tashkil etadi?

Yechish. Futbol maydonini kvadrat metrda ifodalash uchun o‘quvchi 1 ha = 10 000 kvadrat metrga tengligini bilishi kerak.

Bundan $x = 1{,}32 \times 10\,000 = 13\,200$ m^2 bo‘ladi.

Javob: 13 200 m^2.

13. Jahongir qo‘l tozalash vositasi sotib oldi. Shishada 2500 ml suyuqlik bor. Buni litrda qanday ifodalash mumkin?

Yechish. Buni litrda ifodalash uchun 1000 ga bo‘lamiz: 2 500 ml ÷ 1 000 = 2, 5 L ga teng.

Javob: 2,5 L.

15. Bo‘sh joylarni to‘ldiring.

0,61 cm = 0,0061 m	0,10 g = 0,0001 kg	1,4 m = 0,0014 km
0,82 g = 0,00082 kg	0,31 kg = 310 g	0,36 g = 0,00036 kg
9,3 g = 0,0093 kg	8,1 L = 8100 ml	0,62 cm = 0,0062 m
0,69 kg = 0,00069 g	0,13 L = 130 ml	0,91 L = 910 ml
0,37 mm = 0,00000037 km	0,36 km = 36 000 cm	0,91 cm = 0,0000091 km
0,67 L = 670 ml	0,98 kg = 980 g	0,56 cm = 5,6 mm

Summativ baholash. 6-nazorat ishi

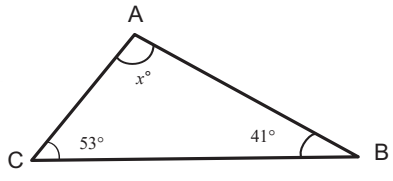
1-variant

1. Koordinatalar sistemasida uchlari A(3; 2), B(–2; 1) va C(0; –2) nuqtalarda bo‘lgan uchburchak yasang.

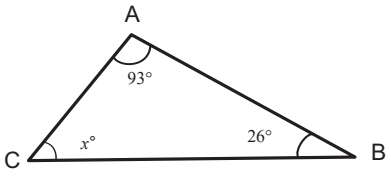
2. Uchburchakning bir tomoni ikkinchi tomonidan 3 cm uzun, uchinchi tomonidan esa 3 cm qisqa. Agar uning perimetri 48 cm ekani ma’lum bo‘lsa, uchburchakning tomonlarini toping.

3. Uchburchaklarning noma’lum burchaklarini toping.

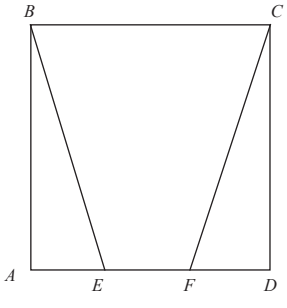
a)



b)



4. ABCD tomoni 8 cm bo‘lgan kvadratda AE = FD = 3 cm bo‘lsa, EBCF to‘rtburchak yuzini toping.



5. Radiusi 7 dm bo‘lgan g‘ildirakning bir marta aylanishda bosib o‘tadigan masofasini diametri 2,8 dm bo‘lgan aylana necha marta aylanganda bosib o‘tadi? ($\pi = \frac{22}{7}$ deb oling).

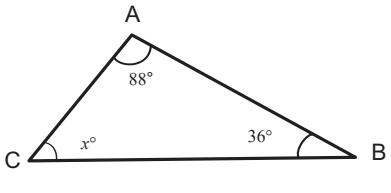
2-variant

1. Koordinatalar sistemasida uchlari P(–3; 2), Q(3; 0) va R(1; –3) nuqtalarda bo‘lgan uchburchak yasang.

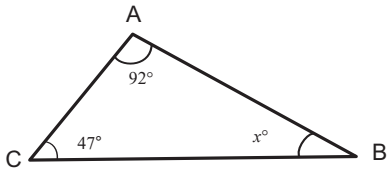
2. Uchburchakning tomonlari uzunliklari ketma-ket kelgan uchta toq sondan iborat. Agar uning perimetri 51 cm ekani ma’lum bo‘lsa, uchburchakning tomonlarini toping.

3. Uchburchaklarning noma’lum burchaklarini toping.

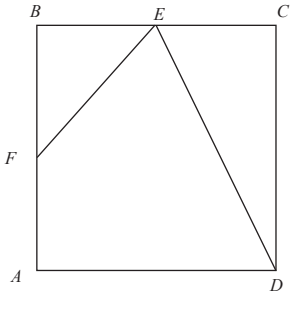
a)



b)



4. ABCD tomoni 12 cm bo‘lgan kvadratda F nuqta AB tomonining, E nuqta BC tomonining o‘rtasi bo‘lsa, AFED to‘rtburchak yuzini toping.



5. Uzunligi 294 cm bo‘lgan aylananing radiusi uzunligi 84 cm bo‘lgan aylana radiusidan necha marta katta? ($\pi = \frac{22}{7}$ deb oling).

VII BOB. NISBAT, PROPORSIYA VA FOIZ

Nisbat

Barcha o‘quvchilar	Nisbat haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Nisbatlar orasidagi munosabatni yaxshi tushunadi, ularga doir misollarni yecha oladi.
Ba’zi o‘quvchilar	Nisbatlar orasidagi munosabatga doir murakkab masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Nisbatga doir misollar keltiring.
2. Soat 1:30 da necha minut bor?
3. 175 minutni soatga aylantiring.
4. Sutkaning 2:3 qismi necha soat bo‘ladi?
5. Sutkaning 1:6 qismi necha soat?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda miqdorni nisbatlarga to‘g‘ri ajratishda qiynalishadi. Ularga dastlab modellar teng nisbatda bo‘lishni eslating.

➢ *Uyga vazifa*

18-misol (178-bet)

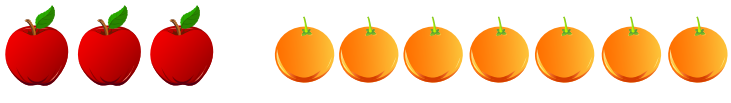
➢ *Mashqlar, ularning javoblari va yechimlari*

1. Ko‘k doiralar sonining qizil oltiburchaklar soniga nisbatini toping.



Ko‘k doiralar soni: $a = 3$ Qizil oltiburchaklar soni: $b = 2$
Ko‘k doiralar sonining qizil oltiburchaklar soniga nisbati 3 : 2.

2. Rasmda 3 ta olma va 7 ta apelsin bor. To‘g‘ri javobni belgilang.

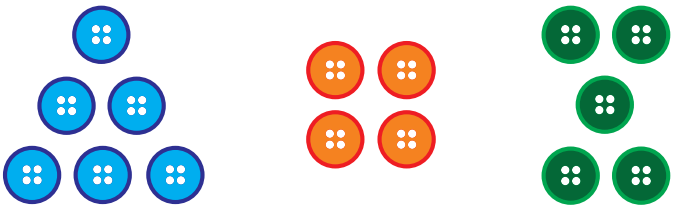


a) Olmalar sonining apelsinlar soniga nisbati 3 : 7 ga teng.
b) Apelsinlar sonining olmalar soniga nisbati 7 : 3 ga teng.
c) Olmalar sonining mevalar umumiy soniga nisbati 7 : 10 ga teng.

3. Qopda 19 ta shar bor, ulardan 7 tasi ko‘k, 3 tasi qizil, qolganlari esa yashil rangda.

a) Ko‘k sharlar sonining jami sharlar soniga nisbatini toping. **Javob:** 7 : 19
b) Qizil sharlar sonining ko‘k sharlar soniga nisbatini toping. **Javob:** 3 : 7
c) Yashil sharlar sonining jami sharlar soniga nisbatini toping. **Javob:** 9 : 19
d) Ko‘k sharlar sonining yashil sharlar soniga nisbatini toping. **Javob:** 7 : 9

4. Tikuvchida 6 ta ko‘k, 4 ta sariq va 5 ta yashil tugma bor. Tikuvchida qanday nisbatda tugmalar bor? To‘g‘ri javobni belgilang.



a) Ko‘k tugmalar sonining sariq va yashil tugmalar soniga nisbati 6 : 4 : 5.
b) Yashil tugmalar sonining sariq tugmalar va umumiy tugmalar soniga nisbati 5 : 4 : 15.
Javob: *a* va *b* javoblar to‘g‘ri berilgan.

5. Toping:

a) Yashil uchburchaklar sonining siyohrang oltiburchaklar soniga nisbatini.



Javob: 6 : 1

b) Siyohrang oltiburchaklar sonining yashil kvadratlar soniga nisbatini.



Javob: 1 : 4

6. Avgust oyida libos do‘koni 460 ta ko‘ylak sotdi, qora va oq rangli ko‘ylaklar soni nisbati 3 : 7. Nechta oq rangli ko‘ylaklar sotilgan?
Yechish: $3x + 7x = 460 \quad \rightarrow 10x = 460 \quad \rightarrow x = 46.$
Oq rangli ko‘ylaklar soni: $3 \times 46 = 138$ ta.
Qora rangli ko‘ylaklar soni: $460 - 138 = 322$ yoki $7 \times 46 = 322$ ta.

7. Sug‘urta kompaniyasining 595 ta mijozi bor. Oddiy mijozlarning imtiyozli mijozlar soniga nisbati 8 : 9 ni tashkil etadi. Kompaniyaning necha nafar oddiy mijozi bor?
Yechish: $8x + 9x = 595 \quad \rightarrow 17x = 595 \quad \rightarrow x = 35.$
Oddiy mijozlar soni: $8 \times 35 = 280$ nafar.
Imtiyozli mijozli soni: $595 - 280 = 315$ yoki $9 \times 35 = 315$ nafar.

8. Murod o‘zi yoqtirgan va yoqtirmagan qo‘shiqlari nisbati 5 : 2 ekanini bildi. Agar u jami 91 ta qo‘shiqni tinglagan bo‘lsa, unga nechta qo‘shiq yoqdi?
Yechish: $5x + 2x = 91 \quad \rightarrow 7x = 91 \quad \rightarrow x = 13.$
Yoqtirgan qo‘shiqlari soni: $5 \times 13 = 65$ ta.
Yoqtirmagan qo‘shiqlari soni: $91 - 65 = 26$ yoki $2 \times 13 = 26$ ta.

9. Supermarketda erkak va ayollar sonining nisbati 4 : 5 edi. U yerda jami 180 kishi bo‘lsa, necha nafar erkak bor?
Ko‘rsatma: *yuqoridagi 6–8-masalalarning yechilish usulidan foydalaning.*

10. Qopda 39 ta shar bor, ulardan 1 tasi ko‘k, 6 tasi qizil va qolganlari yashil rangda. Ko‘k sharlarning yashil sharlarga nisbatini toping.
Yechish: yashil rangdagi sharlar sonini topib olamiz: $39 - 1 - 6 = 32$.
Ko‘k rang 1 ta, yashil rang 32 ta. Ko‘k sharlarning yashil sharlarga nisbati 1: 32.

11. Raqs to‘garagi guruhi 39 nafar a’zodan iborat bo‘lib, ulardan 1 nafari o‘g‘il bola, qolgani qizlar. Qizlarning o‘g‘il bolalarga nisbatini toping.

Yechish. Qizlarning sonini topib olamiz: 39 – 1 = 38 nafar.

Qizlarning o‘g‘il bolalarga nisbati 38 : 1.

12. Pomidor va qizil olmalar 2 : 5 nisbatda. Agar pomidorlar soni 20 ta bo‘lsa, qizil olmalar nechta?

Javob: qizil olmalar soni 50 ta.

13. Har bir nisbatni n : 1 nisbatga keltiring.

a) 20 : 5	b) 15 : 3	c) 100 : 25	d) 34 : 17
a) 4 : 1	b) 5 : 1	c) 4 : 1	d) 2 : 1

Ko‘rsatma: nisbatni kasr ko‘rinishida tasvirlang va kasrning asosiy xossasidan foydalaning. Bu jarayon n : 1 bo‘lguncha davom ettiriladi. Masalan, c variantdagi kabi.

14. Har bir nisbatni 1 : n nisbatga keltiring.

a) 3 : 24	b) 40 : 160	c) 11 : 770	d) 6 : 144
a) 1 : 8	b) 1 : 4	c) 1 : 70	d) 1 : 24

18. Yirik kompaniya katta tadbir o‘tkazmoqchi. Kompaniya xodimlar haqida statistik ma’lumotlarni to‘plashi kerak.

1-savol. Erkak va ayol xodimlar nisbati 1 : 3. Kompaniyada jami 144 nafar ayol ishlasa, erkaklar soni nechta?

Yechish: erkakalar soni 432 nafar. Demak, xodimlar soni 576 nafar.

2-savol. 30 nafar xodimning bolalari maktabda o‘qiydi, 10 nafar xodimning esa umuman farzandi yo‘q. Qolgan ishchilarning farzandlari bog‘chaga boradi. Bog‘cha yoshidagi bolalari bor xodimlarning farzandi bo‘lmagan xodimlarga nisbati qanday?

Yechish: bolalari bog‘chaga boradigan xodimlar soni: 576 – 30 – 10 = 536 nafar. Nisbat: 536 : 10.

3-savol. 45 nafar xodim faxriy yorliq, 9 nafar xodim esa pul mukofoti bilan taqdirlandi. Faxriy yorliq olganlar va pul mukofoti bilan taqdirlanganlarning nisbati qancha?

Javob: 45 : 9 yoki 5 : 1.

4-savol. 10 nafar xodim suyuq ovqatga, 25 nafar xodim esa quyuq ovqatga buyurtma berdi. Ularning nisbatini toping.

Javob: 10 : 25 yoki 2 : 5.

5-savol. Oq mashinasi bor xodimlarning qora mashinasi bor xodimlarga nisbati 5 : 1 ni tashkil qiladi. Agar 10 nafar xodimning oq mashinasi bo‘lsa, nechta xodimning qora mashinasi bor?

Javob: 2 nafar.

6-savol. Musiqa asboblari chaluvchi xodimlarning sport bilan shug‘ullanuvchi xodimlarga nisbati 3 : 20. Agar 40 nafar xodim sport bilan shug‘ullansa, nechta xodim cholg‘u asboblari chalishni biladi?

Javob: 6 nafar.

Proporsiyalar. Proporsiyaning asosiy xossasi

Barcha o‘quvchilar	Proporsiyaning tengligi, uning hadlari haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Proporsiyalar va proporsiyaning asosiy xossalari, ular orasidagi munosabatlarni yaxshi tushunadi, bunga doir misollarni yecha oladi.
Ba’zi o‘quvchilar	Proporsiyalar va proporsiyaning asosiy xossalari va ular orasidagi munosabatlarni yaxshi tushunadi, ularga doir murakkab masalalarni yechadi.

➢ *Faollashtiruvchi savollar*

1. Nisbatga doir misollar keltiring.
2. Proporsiya va nisbatning farqi va o‘xshash hadlarini bilasizmi?
3. Proporsiyaga oid chizmalarni internetdan toping?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda proporsiyaning asosiy xossalaridan foydalana olishga qiynaladi. Bu holatning oldini olish uchun o‘qituvchi taqdimotlar qilishi, mavzuga doir savollar, tarqatmalar tayyorlashi, o‘quvchilarga aylana va to‘rtburchaklar chizdirishi, ularning nisbatlarini amalda ko‘rsatib berishi zarur.

➢ *Uyga vazifa*

13-, 14-misollar (181-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. To‘g‘ri nisbatlarni toping.

a) $4 : 7 = 12 : 21$ b) $5 : 7 = 20 : 21$

c) $4 : 2{,}1 = 8 : 4{,}2$ d) $1{,}5 : 10 = 4{,}5 : 30$

Nisbatlar to‘g‘ri bo‘lishi uchun tenglikning ikkala tarafi bir-biriga teng bo‘lishi kerak. Proporsiyaning asosiy xossasidan foydalanmasdan tekshirish uchun nisbatlarni kasr ko‘rinishida yozib olamiz va kasrning asosiy xossasidan foydalanamiz. Qizil rangda berilgan to‘g‘ri nisbatni tashkil qiladi.

2. Qaysi nisbatlar proporsiyani tashkil qiladi?

a) $26 : 52$ va $39 : 78$ b) $105 : 3$ va $315 : 9$

c) $7{,}5 : 2{,}5$ va $2{,}5 : 1{,}5$ d) $1 : 2$ va $1{,}6 : 3{,}2$

Proporsiyaning asosiy xossasidan foydalanmasdan tekshirish uchun nisbatlarni kasr ko‘rinishida yozib olamiz va kasrning asosiy xossasidan foydalanamiz. Qizil ranglilar proporsiyani tashkil qiladi.

3. Nisbatlar proporsiyani hosil qiladimi?

a) $\frac{4}{2}$ va $\frac{20}{6}$ b) $\frac{3}{2}$ va $\frac{18}{0}$ c) $\frac{4}{3}$ va $\frac{16}{12}$ d) $\frac{4}{3}$ va $\frac{8}{6}$

Javob: a va b variantlar proporsiya tashkil qilmaydi.

4. Proporsiyani tekshiring.

a) $9 : 3 = 24 : 8$ b) $0{,}12 : 0{,}01 = 3{,}6 : 0{,}3$ c) $1{,}5 : 3 = 2 : 4$

d) $50 : 10 = \frac{1}{2} : \frac{1}{10}$ e) $16 : 4 = 0{,}4 : 0{,}1$ f) $\frac{2}{3} : \frac{4}{9} = 6 : 9$

Ko‘rsatma: *proporsiyaning asosiy xossasidan foydalanamiz.*

Masalan: a) $9 \times 8 = 3 \times 24 \rightarrow 72 = 72$

5. Nisbatni qisqartiring. Hosil bo‘lgan proporsiyaning chetki va o‘rta hadlarini ayting.

a) 6 : 10 b) 9 : 15 c) 7 : 35 d) 10 : 28 e) 7 : 7

Namuna. 6 : 10 nisbatni kasr ko‘rinishida yozing va qisqartiring.

$6:10 = \frac{6}{10} = \frac{3}{5} = 3:5$, 6 va 5 chetki, 10 va 3 esa o‘rta hadlar.

b) $9:15 = \frac{9}{15} = \frac{3}{5} = 3:5$, 9 va 5 chetki, 15 va 3 o‘rta hadlar.

c) $7:35 = \frac{7}{35} = \frac{1}{5} = 1:5$, 7 va 5 chetki, 35 va 1 o‘rta hadlar.

d) $10:28 = \frac{10}{28} = \frac{5}{14} = 5:14$, 10 va 14 chetki, 28 va 5 o‘rta hadlar.

e) $7:7 = \frac{7}{7} = \frac{1}{1} = 1:1$, 7 va 1 chetki, 7 va 1 o‘rta hadlar.

6. Supermarketda kir yuvish kukuni quyida ko‘rsatilgandek 3 xil paketda sotiladi.

a) B paketi massasini C paketi massasining bir qismi sifatida ifodalang.

b) C ning massasi A ning massasidan necha marta og‘irroq?

c) B ning massasining A ning massasiga nisbatini kasr ko‘rinishida ifodalang.



a) B = C : 2 b) 5 marta og‘ir c) $5:2 = \frac{5}{2}$

7. Proporsiyaning noma’lum hadini toping.

Proporsiyaning chetki hadlari ko‘paytmasini o‘rta hadlari ko‘paytmasiga tenglab, noma’lum sonni topamiz:

a) $3x:6=54:72$

$3x\cdot 72=6\cdot 54$

$x=\frac{3}{2}$

b) $12:x=8:11$

$8x=12\cdot 11$

$x=\frac{33}{2}$

8. Proporsiyaning o‘rta hadlari 36 va 4 ga, chetki hadlarining biri esa 18 ga teng. Proporsiyaning ikkinchi chetki hadini toping.

Yechish:

$18:36=4:x$

$18x=36\cdot 4$

$x=8$

9. Noma’lum vaqtni toping.

Yechish:

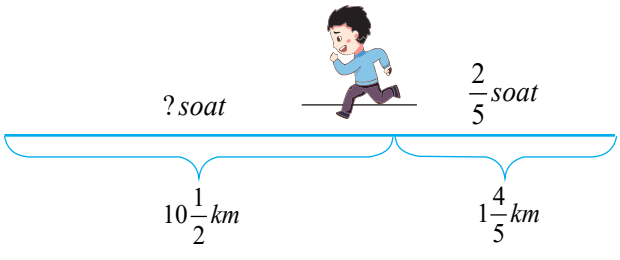
$$1\frac{4}{5}:\frac{2}{5}=10\frac{1}{2}:x$$

$$\frac{9}{5}\cdot\frac{5}{2}=\frac{21}{2}\cdot\frac{1}{x}$$

$$\frac{9}{2}=\frac{21}{2x}$$

$$9x=21$$

$$x=\frac{7}{3}$$



10. Proporsiyaning chetki hadlari 48 va 3 ga, o‘rta hadlarining biri esa 12 ga teng. Proporsiyaning ikkinchi o‘rta hadini toping.

Yechish:

$48:12=x:3$

$48\cdot 3=12x$

$x=12$

11. Sayohatchilar guruhidagi erkaklarning ayollar soniga nisbati 5 : 2 ni tashkil qiladi. 70, 48, 19, 84, 28 sonlaridan qaysilari guruhdagi sayohatchilar soniga teng bo‘la olmaydi?

Yechish. Erkaklar va ayollar jami $7x$ bo‘lsa, $7x$ ni berilgan sonlarga tenglaymiz va butun qiymatlilarni yechim sifatida qabul qilamiz:

1) $7x=70 \rightarrow x=10$

2) $7x=48 \rightarrow x=\frac{48}{7}$

3) $7x=19 \rightarrow x=\frac{19}{7}$

4) $7x=84 \rightarrow x=12$

5) $7x=28 \rightarrow x=4$

Javob: 70, 84, 28 teng bo‘la oladi, 48 va 19 teng bo‘la olmaydi.

12. 100 m^3 havoda 21 m^3 kislorod bor. Eni 8 m, bo‘yi 10 m va balandligi 3,25 m bo‘lgan xonadagi kislorod hajmini toping.

Berilganlardan xona hajmini topamiz va proporsiya tuzamiz:

$$V = abc$$

$$V = 8 \cdot 10 \cdot 3,25 = 260 m^3$$

$$100 : 21 = 260 : x$$

$$100x = 260 \cdot 21$$

$$x = \frac{273}{5} = 54,6$$

13. Ravshan va Farhod pullarini taqqoslashganda ularning nisbati 5 : 3 edi. So‘ng Ravshan 1,6 mln. so‘mga planshet sotib oldi. Endi ularning pullari nisbati 3 : 5 bo‘ldi. Planshet sotib olishdan oldin Ravshanda qancha pul bor edi?

Yechish:

Dastlab Ravshanning puli x million so‘m bo‘lganda nisbat 5 : 3 edi.

Planshet olgandan $(x - 1,6)$ mln so‘mdan keyin puli 3 : 5 nisbatda bo‘ladi.

Proporsiya tuzamiz: $(5x - 1,6) : 3x = 5 : 3$ tenglikka ega bo‘lamiz.

Proporsiyaning xossasidan foydalanib tenglamani yechib, $x = 2,5$ mln ekanini topamiz.

Demak, Ravshanda dastlab 2,5 mln so‘m pul bo‘lgan.

14. Benzin o‘lchagich ko‘rsatkichi bakning qancha qismi benzin bilan to‘lganini ko‘rsatadi?



Agar qizil ko‘rsatkich 0 ni ko‘rsatsa, bak bo‘sh, 1 ni ko‘rsatsa, bak to‘la bo‘ladi.

Avtomobilning benzin o‘lchagichi teng qismlarga bo‘lingan. To‘liq bakka 64 L benzin sig‘adi. Benzin o‘lchagichga ko‘ra, bakni to‘ldirish uchun yana necha litr benzin kerak bo‘ladi?

Yechish. O‘lchagich teng qismga bo‘linganini hisobga olib, $\frac{3}{4}$ qismini topamiz:

$64 \cdot \frac{1}{4} = 16$ litr benzin bor. Demak, bakni to‘ldirish uchun yana 64 – 16 = 48 L benzin kerak.

Javob: 48 L.

Proporsiyaning asosiy xossasi tatbiqlari

Barcha o‘quvchilar	Proporsiyaning asosiy xossasi, uning hadlari haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Proporsiyalar va proporsiyaning asosiy xossalari, ular orasidagi munosabatlarni yaxshi tushunadi, ularni misollarga tatbiq eta oladi.
Ba’zi o‘quvchilar	Proporsiyalar va proporsiyaning asosiy xossalari, ular orasidagi munosabatlarni yaxshi tushunadi, ularni murakkab masalalarga tatbiq qilib yechadi.

➢ *Faollashtiruvchi savollar*

1. Nisbatga doir misollar keltiring.
2. Proporsiya va nisbatning farqli hamda o‘xshash jihatlarini bilasizmi?
3. Proporsiyaning asosiy xossasini tushuntiring.
4. Proporsiyaga oid chizmalarni internet orqali toping.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda proporsiyaning asosiy xossalaridan foydalana olishga qiynaladi. Bu holatning oldini olish uchun o‘qituvchi mavzuni taqdimotlar qilishi, mavzuga doir savollar, tarqatmalar tayyorlashi, o‘quvchilarga aylana va to‘rtburchaklar chizdirishi, ularning nisbatlarini amalda ko‘rsatib berishi zarur.

➢ *Uyga vazifa*

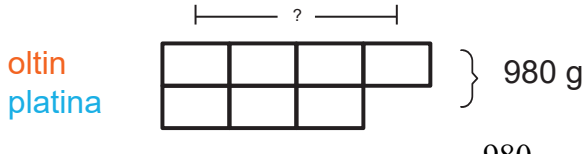
12-, 13-misollar (183-bet).

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Sonni berilgan nisbatda bo‘lish

Podshoh tojining og‘irligi 980 g bo‘lib, oltin va platinadan yasalgan. Tojda oltin va platina massalari nisbati 4 : 3 ga teng. Tojni yasash uchun qancha oltin va qancha platina ishlatilgan?

Mos diagramma tuzib yeching:



To‘rtburchaklar soni: 4 + 3 = 7 Har bir to‘rtburchakka $\frac{980}{7} = 140$ g mos keladi.

Demak, oltin: 4 × 140 = 560 g, platina: 3 × 140 = 420 g.

Boshqacha aytganda, biz 980 sonini berilgan 4 : 3 nisbatda bo‘ldik.

2. Sonlarni berilgan nisbatda bo‘ling.

a) 48 ni 3 : 5 b) 100 ni 7 : 3 c) 56 ni 1 : 6 d) 50 ni 4 : 1

e) 120 ni 5 : 3 f) 75 ni 8 : 7 g) 90 ni 4 : 5 h) 120 ni 40 : 20

Yechish: nisbatlar yig‘indisini hisoblab, berilgan songa bo‘lamiz. So‘ng yechimni nisbatlarga ko‘paytiramiz.

a) $3 + 5 = 8$ → $48 \div 8 = 6$ → $6 \times 3 = 18;\ 6 \times 5 = 30$ → $18 : 30$

b) $7 + 3 = 10$ → $100 \div 10 = 10$ → $10 \times 7 = 70;\ 10 \times 3 = 30$ → $70 : 30$

c) $1 + 6 = 7$ → $56 \div 7 = 8$ → $8 \times 1 = 8;\ 8 \times 6 = 48$ → $8 : 48$

5. Abu Rayhon Beruniy masalasi. G‘ishtning o‘lchamlari 5, 4, 3 uzunlik birligiga teng. Bunday g‘ishtning 30 tasining narxi 60 dirham. O‘lchamlari 8, 6, 2 uzunlik birligiga teng 20 ta g‘ishtning narxi necha dirham bo‘ladi?

$$\frac{60}{x} = \frac{30}{20} \times \frac{3}{2} \times \frac{4}{6} \times \frac{5}{8}$$

Bu tenglamada noma’lum x topiladi: $x = \dfrac{60 \times 20 \times 2 \times 6 \times 8}{30 \times 3 \times 4 \times 5}$, bundan $x = 64$ dirham.

6. *Abu Rayhon Beruniy masalasi (3 miqdor qoidasi).* Agar 10 dirham (pul birligi) 2 oyda 5 dirham foyda keltirsa, 8 dirham 3 oyda qancha foyda keltiradi?

Yechish: $10 \times 2 \times x = 5 \times 8 \times 3$

$x = 6$

Javob: 8 dirham 3 oyda 6 dirham foyda keltiradi.

7. 3 ta mushuk 16 minutda 6 ta sichqon tutsa, 4 ta mushuk 20 minutda nechta sichqon tutadi?

Yechish: $3 \times 16 \times x = 4 \times 4 \times 20$

$x = 10$

Javob: 4 ta mushuk 20 minutda 10 ta sichqon tutadi.

3	4
16	20
6	x

8. 5 ta otga 30 kunda 9 q yem beriladi. Shu me’yorda yem berilsa, 12 ta otga 18 kunda qancha yem berilishi kerak?

Yechish:

$$\frac{5}{12} \cdot \frac{30}{18} = \frac{9}{x} \Rightarrow \frac{25}{36} = \frac{9}{x} \Rightarrow x = \frac{9 \cdot 36}{25} \Rightarrow x = 12{,}96$$

Javob: 12,96 q yem berilishi kerak.

5	12
30	18
9	x

9. 8,5 t yukni 17,5 km masofaga tashish uchun 63 000 so‘m to‘lanadi. 72 000 so‘m berib, qancha yukni 20 km masofaga tashittirish mumkin?

Yechish:

$$\frac{8{,}5}{x} \cdot \frac{17{,}5}{20} = \frac{63000}{72000}$$

$$\frac{8{,}5 \cdot 17{,}5}{20x} = \frac{7}{8}$$

$$35x = 8 \cdot 8{,}5 \cdot 17{,}5$$

$$x = 8{,}5$$

Javob: 8,5 tonna.

8,5	x
17,5	20
63 000	72 000

10. Uzunligi 3,6 m, kengligi 1 cm va qalinligi 0,7 cm bo‘lgan metall tasmaning massasi 1,98 kg. Xuddi shu metalldan uzunligi 9,6 m, kengligi 2,5 cm, qalinligi 1,4 cm bo‘lgan tasma yasalsa, uning massasi necha kg bo‘ladi?

Yechish: $\frac{360}{960}\cdot\frac{1}{2,5}\cdot\frac{0,7}{1,4}=\frac{1,98}{x}$

$\frac{3}{40}=\frac{1,98}{x}$

$x=26,4$

Javob: 26,4 kg.

11. 54 ta usta 20 qavatli uyni 30 kunda bo‘yab bitiradi. 27 qavat uyni 42 kunda bo‘yab tugatish uchun nechta usta kerak?

Yechish: $\frac{54}{x}\cdot\frac{20}{27}=\frac{30}{42}$

Javob: 56 ta usta kerak.

54	x
20	27
30	42

12. Binoda 9 ta lampochka har kuni 5 soat yonib turadi. Sarflangan elektr uchun 24 kunda 19 444 so‘m to‘landi. Agar shu binoda 6 ta shunday lampochka har kuni 4 soatdan yonib tursa, 15 120 so‘m pul necha kunlik elektr sarfiga yetadi?

Yechish: 45 × 24 = 1080 soat

$19444\cdot 24x=15120\cdot 1080$

$x=\frac{15120\cdot 1080}{19444\cdot 24}$ $x\approx 35$ **Javob:** 35 kunlik.

13. 1-xonada 1 ta 60 vattli, 2-xonada 1 ta 100 vattli, 3-xonada 2 ta 40 vattli va 4-xonada 2 ta 60 vattli lampochkalar bor. Lampochkalar har kuni bir xil muddatda yoniq bo‘ladi va 8 kunda sarflanadigan elektr uchun 2 592 so‘m to‘lanadi. Har bir xonada ko‘rsatilgan muddatda necha so‘mlik elektr sarflangan?

Javob: 1-xonada 75 so‘m, 2-xonada 125 so‘m, 3-xonada 100 so‘m, 4-xonada 150 so‘mlik elektr sarflanadi.

Foizlar

Barcha o‘quvchilar	Foizlarning asosiy xossasi haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Sonning foizini, foizni sonda ifodalashni yaxshi biladi, misollarga tatbiq etadi.
Ba’zi o‘quvchilar	Foizlar va sonlar orasidagi munosabatlarni yaxshi tushunadi, ularni murakkab masalalar va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Nisbatga doir misollar keltiring.
2. Foiz nima?
3. 120 sonining 12 foizini topishni tushuntiring.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

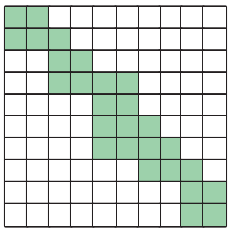
Sonlarni foizlar orqali yoki foizlarni sonlar orqali ifodalashda o‘quvchilar xatoliklarga yo‘l qo‘yishi mumkin. Bu mavzuni to‘liqroq tushunishlari uchun 5-sinfda o‘tilgan “Foizlar” mavzusini eslating. Dastlab 10%, 50%, 100% larni tushuntiring. Tushuntirishda modellardan foydalaning. Turli to‘rtburchak, oltiburchak, sakkizburchak va doirachalar yasash, ularda nisbat, proporsiya va foizlarni tushuntirish zarur.

➢ *Uyga vazifa*

17-20-misollar (186-bet)

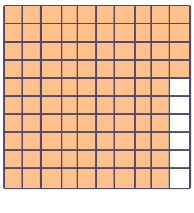
➢ *Mashqlar, ularning javoblari va yechimlari*

1. Namuna asosida bo‘yalgan qism butun kvadratning necha foizini tashkil qilishini aniqlaymiz.

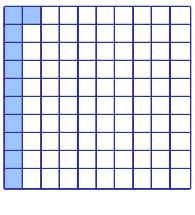


Namuna: jami 100 katakdan 27 tasi bo‘yalgan. Har bir katak kvadratning 100 dan bir qismini, ya’ni 1 foizini tashkil qiladi. Demak, 27 ta katak bo‘yalgan bo‘lib, bo‘yalgan qism butun kvadratning

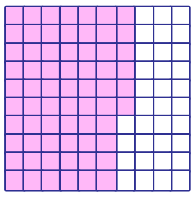
$\frac{27}{100}$ = 27% ini tashkil qiladi.



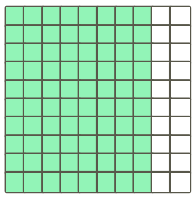
94 %



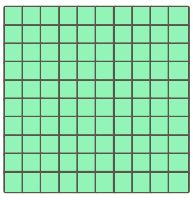
11 %



66 %



80 %



100 %

2. Bo‘sh kataklarni to‘ldiring.

a) $\frac{3}{4}=\frac{3}{4}\times 100=75\%$

b) $\frac{9}{10}=\frac{9}{10}\times 100=90\%$

c) $\frac{8}{25}=\frac{8}{25}\times 100=32\%$

d) $\frac{17}{20}=\frac{17}{20}\times 100=85\%$

3. Bo‘sh kataklarni to‘ldiring.

a) $16\%=\frac{16}{100}=0,16$

b) $7\%=\frac{7}{100}=0,07$

c) $28\%=\frac{28}{100}=0,28$

d) $78\%=\frac{78}{100}=0,78$

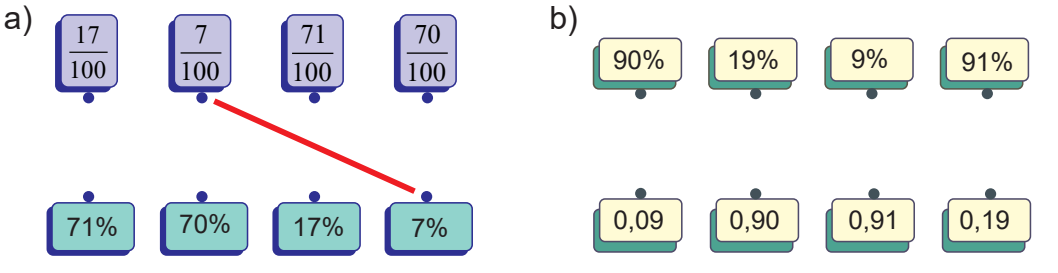
e) $85\%=\frac{85}{100}=0,85$

f) $56\%=\frac{56}{100}=0,56$

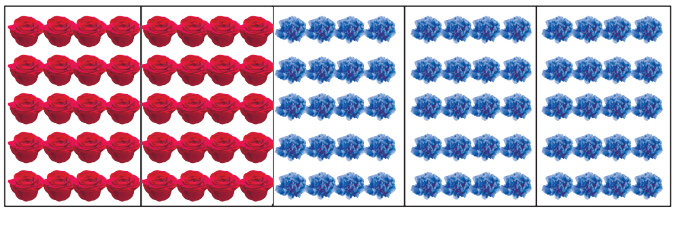
4. Moslarini belgilang.

a) $\frac{17}{100}=17\%$ $\frac{7}{100}=7\%$ $\frac{71}{100}=71\%$ $\frac{70}{100}=70\%$

b) $90\%=0,90$ $19\%=0,19$ $9\%=0,09$ $91\%=0,91$



5. Hovlidagi gullarning 40% i atirgullar. Atirgullar barcha gullarning qanday qismini tashkil qiladi? Javobni qisqarmas kasr ko‘rinishida yozing.



Yechish: $40\%=\frac{40}{100}=\frac{4}{10}=\frac{2}{5}$

6. Bo‘sh joylarni to‘ldiring.

$7\%=\frac{7}{100}$ $1\%=\frac{1}{100}$ $43\%=\frac{43}{100}$ $14\%=\frac{14}{100}$

$68\%=\frac{68}{100}$ $5\%=\frac{5}{100}$ $84\%=\frac{84}{100}$

$7\% = \frac{\quad}{100}$	$1\% = \frac{\quad}{100}$
$43\% = \frac{\quad}{100}$	$99\% = \frac{\quad}{100}$
$14\% = \frac{14}{\quad}$	$68\% = \frac{68}{\quad}$
$5\% = \frac{5}{\quad}$	$84\% = \frac{84}{\quad}$

7. 10×10 katakli kvadratni qog‘ozga chizib, mos qismni bo‘yang.

$12\% = \frac{12}{100}$ J: 12 ta

$25\% = \frac{25}{100}$ J: 25 ta

$50\% = \frac{50}{100}$ J: 50 ta

$99\% = \frac{99}{100}$ J: 99 ta

$120\% = \frac{120}{100}$ J: 120 ta

$200\% = \frac{200}{100}$ J: 200 ta

8. Kasr ko‘rinishida ifodalang.

a) $10\% = \frac{10}{100} = \frac{1}{10}$

b) $80\% = \frac{80}{100} = \frac{4}{5}$

c) $25\% = \frac{25}{100} = \frac{1}{4}$

d) $75\% = \frac{75}{100} = \frac{3}{4}$

e) $135\% = \frac{135}{100} = 1\frac{7}{20}$

f) $8\% = \frac{8}{100} = \frac{2}{25}$

g) $4\% = \frac{4}{100} = \frac{1}{25}$

h) $2\% = \frac{2}{100} = \frac{1}{50}$

i) $150\% = \frac{150}{100} = 1\frac{1}{2}$

j) $350\% = \frac{350}{100} = 3\frac{1}{2}$

9. Jahongir jami pulining $\frac{4}{10}$ qismini tushlik uchun sarfladi. U tushlik uchun jami pulining necha foizini sarflagan?

Yechish: $\frac{4}{10} \times 100 = 40$ **Javob:** tushlik uchun jami pulining 40 % ini sarflagan.

10. Sonlarni foizlarda ifodalang.

a) $0{,}45 = \frac{45}{100} = 45\%$

b) $0{,}20 = \frac{20}{100} = 20\%$

c) $0{,}99 = \frac{99}{100} = 99\%$

d) $0{,}32 = \frac{32}{100} = 32\%$

e) $0{,}01 = \frac{1}{100} = 1\%$

f) $1{,}5 = \frac{150}{100} = 150\%$

g) $1,75 = \frac{175}{100} = 175\%$

h) $2,5 = \frac{250}{100} = 250\%$

i) $5 = \frac{500}{100} = 500\%$

j) $5,5 = \frac{550}{100} = 550\%$

11. Nasibada 20 ta olma bor, shulardan 14 tasi qizil. Qizil olmalar jami olmalarning necha foizini tashkil etadi?

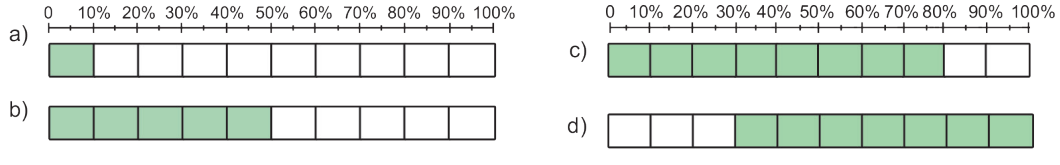
Yechish: $\frac{14}{20} \times 100 = 70$ **Javob:** qizil olmalar jami olmalarning 70 % ini tashkil qiladi.

12. Konsertga borgan 200 nafar o‘quvchidan 98 nafari o‘g‘il bolalar. O‘g‘il bolalar jami o‘quvchilarning necha foizini tashkil etadi?

Yechish: $\frac{98}{200} \times 100 = 49$

Javob: o‘g‘il bolalar jami o‘quvchilarning 49 % ini tashkil qiladi.

13. Har bir shkalaning necha foizi bo‘yalgan?



a) $\frac{1}{10} \times 100 = 10\%$

b) $\frac{5}{10} \times 100 = 50\%$

c) $\frac{8}{10} \times 100 = 80\%$

d) $\frac{7}{10} \times 100 = 70\%$

14. Halima xola pishirgan somsalarning $\frac{3}{4}$ qismi kartoshkali.

a) Bu necha foizni tashkil qiladi?

b) Kartoshka qo‘shilmagan somsalar necha foizni tashkil qiladi?

a) $\frac{3}{4} \times 100 = 75\%$ i kartoshkali.

b) $100\% - 75\% = 25\%$ i esa kartoshkasiz.

15. Sinfdagi o‘quvchilar soni 25 nafar bo‘lib, ulardan 7 nafari qizlar.

a) Qizlar necha foizni tashkil qiladi?

b) O‘g‘il bolalar necha foizni tashkil qiladi?

a) $\frac{7}{25} \times 100 = 28\%$ ini qizlar taskil qiladi.

b) $100\% - 28\% = 72\%$ ini o‘g‘il bolalar tashkil qiladi.

16. Zamirada 75 000 so‘m bor edi. U 30 000 so‘mni sarfladi. Uning necha foiz puli qoldi?

Yechish: 75000 – 30000 = 45000 so‘m $\frac{45000}{75000}\times 100 = 60\%$.

Javob: Zamirada jami pulning 60% i qoldi.

17. Foiz ko‘rinishida ifodalang.

a) $0,63 = \frac{63}{100} = 63\%$ b) $0,05 = \frac{5}{100} = 5\%$ c) $0,2 = \frac{20}{100} = 20\%$

d) $0,5 = \frac{50}{100} = 50\%$ e) $0,45 = \frac{45}{100} = 45\%$ f) $0,85 = \frac{85}{100} = 85\%$

18. Eng sodda kasr ko‘rinishida ifodalang.

a) $46\% = \frac{46}{100} = \frac{23}{50}$ b) $5\% = \frac{5}{100} = \frac{1}{20}$

c) $7\% = \frac{7}{100}$ d) $80\% = \frac{80}{100} = \frac{4}{5}$

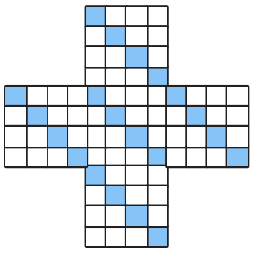
19. O‘nli kasr ko‘rinishida ifodalang.

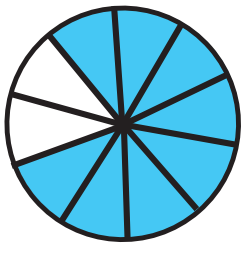
a) $15\% = 0,15$ b) $41\% = 0,41$ c) $7\% = 0,07$ d) $80\% = 0,8$

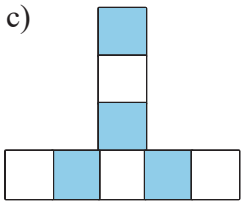
20. Shakllarning necha foizi bo‘yalgan?

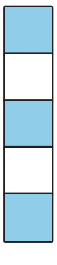
a) $\frac{4}{16}\times 100 = 25\%$ b) $\frac{8}{10}\times 100 = 80\%$

c) $\frac{4}{8}\times 100 = 50\%$ d) $\frac{3}{5}\times 100 = 60\%$

a) 

b) 

c) 

d) 

Sonning foizini va foiziga ko‘ra sonni topish

Barcha o‘quvchilar	Sonning foizini va foizga ko‘ra sonni topish haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Sonning foizini va foizga ko‘ra sonni topishni yaxshi tushunadi, bilimini ularga doir misollarga tatbiq etadi.
Ba’zi o‘quvchilar	Sonning foizini va foizga ko‘ra sonni topishni yaxshi tushunadi, bilmini murakkab masalalar va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Foiz nima?
2. To‘g‘ri va teskari proporsiya farqini ajrata olasizmi?
3. Sonning foizini va foizga ko‘ra sonni topishga misol ayta olasizmi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar ba’zan sonning foizini va foiziga ko‘ra sonni topishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuga doir taqdimotlar qilishi, savollar, tarqatmalar tayyorlashi, o‘quvchilarga aylana va to‘rtburchaklarni chizdirishi, ularning foizlarini amalda ko‘rsatib berishi zarur.

➢ *Uyga vazifaa*

17-, 18-misollar (189-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Bo‘sh kataklarni to‘ldiring.

a) 12 soni 120 ning necha foizi? b) 30 soni 150 ning necha foizi?

Yechish:

a) $\frac{12}{120}\times 100 = 10\%$ b) $\frac{30}{150}\times 100 = 20\%$

2. Berilgan sonlar 500 ning necha foizini tashkil qiladi?

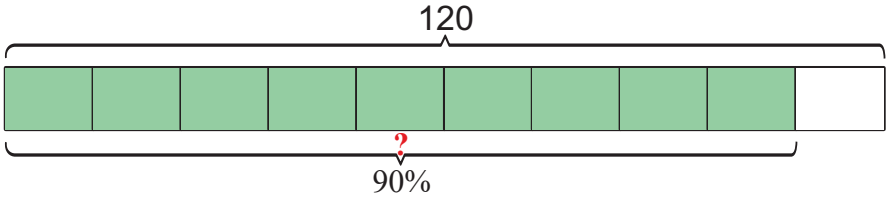
a) 150 b) 250 c) 300 d) 350 e) 450

Yechish:

a) $\frac{150}{500}\times 100 = 30\%$ b) $\frac{250}{500}\times 100 = 50\%$

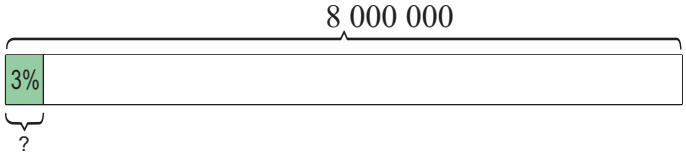
c) $\frac{300}{500}\times 100 = 60\%$ d) $\frac{350}{500}\times 100 = 70\%$

3. 120 nafar o‘quvchidan 90% i test topshirdi. Necha nafar o‘quvchi test topshirdi?



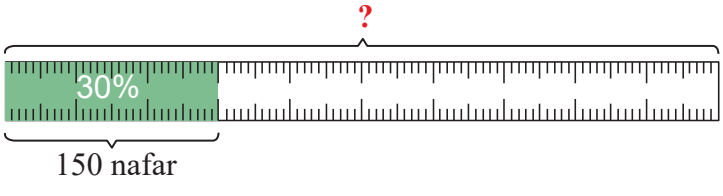
Yechish: $\frac{120\times 90\%}{100\%}=108$ **Javob:** 108 nafar.

4. Umidjonning oilasi 8 000 000 so‘mga muzlatkich sotib oldi. Do‘kon ularga 3% chegirma belgiladi. Chegirma necha so‘mni tashkil qildi?



Yechish: $\frac{8000000\times 3\%}{100\%}=240000$ **Javob:** 240 000 so‘m.

5. Korxonadagi 150 nafar ayol jami ishchilarning 30% ini tashkil qiladi. Korxonadagi jami ishchilar soni qancha?



Yechish: $\frac{150}{30\%}\times 100\%=500$. **Javob:** korxonadagi jami ishchilar 500 nafar.

6. Qiymatlarni toping.

a) $\frac{300\times 5\%}{100\%}=15$ b) $\frac{25\times 5\%}{100\%}=\frac{5}{4}=1,25$

c) $\frac{200\times 8\%}{100\%}=16$ d) $\frac{50kg\times 20\%}{100\%}=10kg$

e) $\frac{70km\times 45\%}{100\%}=31,5km$ f) $\frac{400g\times 75\%}{100\%}=300g$

7. Zafar 20 ta savoldan 18 tasiga to‘g‘ri javob berdi. U savollarning necha foiziga to‘g‘ri javob bergan?

Yechish: $\frac{18}{20}\times 100\%=90\%$.

Javob: Zafar savollarning 90 % iga to‘g‘ri javob bergan.

8. Marafonda 1 500 kishi ishtirok etdi. Ularning 450 nafari havaskorlar. Qolganlari sportchilar. Ishtirokchilarning necha foizi sportchilar edi?

Yechish: $\frac{1\,500-450}{1\,500}\times 100\% = \frac{1\,050}{1\,500}\times 100\% = 70\%$

Javob: istirokchilarning 70 % i sportchilar bo‘lgan.

9. Oqila 5 kg un sotib oldi. U 2 kg unni pechenyega, qolganini ananasli tort tayyorlashga sarfladi. Ananasli tortni tayyorlash uchun unning necha foizi ishlatilgan?

Yechish: $\frac{5\,\text{kg}-2\,\text{kg}}{5\,\text{kg}}\times 100\% = 60\%$

Javob: ananasli tort tayyorlash uchun unning 60 % i ishlatilgan.

10. Bir qutidagi 100 ta apelsindan 15 tasi yaroqsiz. Apelsinlarning necha foizi yaroqsiz?

Yechish: $\frac{15}{100}\times 100\% = 15\%.$ **Javob:** apelsinning 15 % i yaroqsiz.

11. Avtoturargohda 50 ta avtotransport vositalaridan 14 tasi mototsikl. Bu jami avtotransportlarning necha foizini tashkil qiladi?

Yechish: $\frac{14}{50}\times 100\% = 28\%.$

Javob: matotsikllar transportlarning 28 % ini tashkil qiladi.

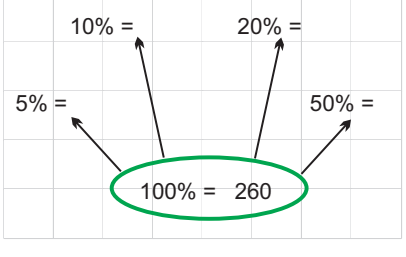
12. Qopda 100 ta shar bor. Ulardan 37 tasi yashil rangda. Qolganlari qizil rangda. Sharlarning necha foizi qizil rangda?

Yechish: $\frac{100-37}{100}\times 100\% = 63\%.$ **Javob:** sharlarning 63 % i qizil rangda bo‘lgan.

13. Bo‘sh o‘rinlarni to‘ldiring.

a) $5\% = \frac{260\times 5\%}{100\%} = 13$

b) $10\% = \frac{260\times 10\%}{100\%} = 26$



c) $20\% = \frac{260\times 20\%}{100\%} = 52$

d) $50\% = \frac{260\times 50\%}{100\%} = 130$

14. Agar idishning 70% i suv bilan to‘ldirilgan bo‘lsa, uning necha foizi bo‘sh?

Javob: 100 % – 70 % = 30 %. **Javob:** idishning 30 % i bo‘sh bo‘lgan.

15. Bo‘sh kataklarni to‘ldiring.

a) $100 + \frac{100\times 50\%}{100\%} = 150$ $\qquad 150 - \frac{150\times 20\%}{100\%} = 120$

$120 - \frac{120\times 25\%}{100\%} = 90$ $\qquad 90 - \frac{90\times 50\%}{100\%} = 45$

b) $500-\frac{500\times 20\%}{100\%}=400$ $\qquad$ $400+\frac{400\times 50\%}{100\%}=600$

$600+\frac{600\times 50\%}{100\%}=900$ $\qquad$ $900-\frac{900\times 90\%}{100\%}=90$

16. Kichik shaharchada 1200 kishi yashaydi. Ularning 45 foizi bolalar. Shaharchada necha nafar bola bor?

Yechish: $\frac{1\,200\times 45\%}{100\%}=540$. $\qquad$ **Javob:** shaharchada 540 nafar bola bor.

17. Bog‘ning maydoni 60 m^2. Uning 7 foizini hovuz egallaydi. Hovuzning maydoni qancha?

Yechish: $\frac{60\,m^2\times 7\%}{100\%}=4,2\,m^2$. $\qquad$ **Javob:** hovuzning maydoni 4,2 m^2.

18. Diktantda 200 ta so‘z bor edi. Sanobar ularning 90 foizini to‘g‘ri yozgan. U nechta so‘zni to‘g‘ri yozgan?

Yechish: $\frac{200\times 90\%}{100\%}=180$ $\qquad$ **Javob:** U 180 ta so‘zni to‘g‘ri yozgan.

19. Kutubxonada 20 nafar ishchi ishlaydi. Ularning 55 foizini ayollar tashkil etadi. Kutubxonada necha nafar erkak ishchi bor?

Yechish: 1) $\frac{20\times 55\%}{100\%}=11$ $\qquad$ 2) 20 – 11 = 9

Javob: kutubxonada 9 nafar erkak ishchi bor.

20. Savdo do‘koni tovarlarga chegirma e’lon qildi. Foizli chegirmadan keyingi narx qanchaga teng bo‘ladi?



Yechish:

a) $320-\frac{320\times 2}{100}=320-6,4=313,6$ $\qquad$ b) $150-\frac{150\times 4}{100}=150-6=144$

c) $250-\frac{250\times 8}{100}=250-20=230$

Foizlarni hisoblashga oid masalalar

Barcha o‘quvchilar	Foizlarni hisoblashga oid masalalar haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Foizlarni hisoblashga oid masalalarni yaxshi tushunadi, ularni misollarga tatbiq eta oladi.
Ba’zi o‘quvchilar	Foizlarni hisoblashga oid masalalarni yaxshi tushunadi, ularni murakkab masalalar va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Foiz nima?
2. 45 ning 30 foizi necha?
3. Foizlarni hisoblashga oid masalalar ayta olasizmi?
4. Son 10% ga qanday orttiriladi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

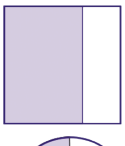
O‘quvchilar ba’zan foizlarni hisoblashga oid masalalarda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuga doir taqdimotlar, savollar, tarqatmalar tayyorlashi, o‘quvchilarga aylana va to‘rtburchaklar chizdirishi, ularning foizlarini amalda ko‘rsatib berishi zarur.

➢ *Uyga vazifa*

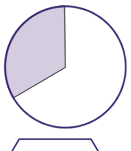
14-, 15-misollar (191-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

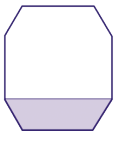
1. Shakllarning taxminan necha foizi bo‘yalgan? Javobni eng yaqin 10% gacha aniqlikda yaxlitlang.



1) Deyarli $\frac{3}{4}$ qismi, taxminan necha foizi bo‘yalgan?

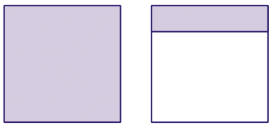


2) Deyarli $\frac{1}{3}$ qismi, taxminan necha foizi bo‘yalgan?



3) Deyarli $\frac{1}{4}$ qismi, taxminan necha foizi bo‘yalgan?

4) Birinchi kvadrat to‘liq, ikkinchi kvadratda esa deyarli $\frac{2}{10}$ qismi, ya’ni taxminan jami necha foizi bo‘yalgan?

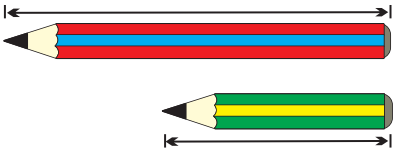


Ko‘rsatma: *har bir kasr foizlarda ifodalanadi.*

Javob: 1-shaklning 75 % i, 2-shaklning 33 % i, 3-shaklning 25 % i, 4-shaklning 120 % i bo‘yalgan.

2. Kichik qalam katta qalamning necha foizini tashkil qiladi? Chizg‘ichdan foydalaning.

Yechish: $\frac{3}{5}\times 100\% = 60\%$



Javob: 60% ini tashkil qiladi.

3. Shakllarning taxminan necha foizi bo‘yalgan? Javobni eng yaqin 10 % gacha aniqlikda yaxlitlang.

a) $\frac{2}{5}\times 100\% = 40\%$

b) $\frac{3}{4}\times 100\% = 75\%$

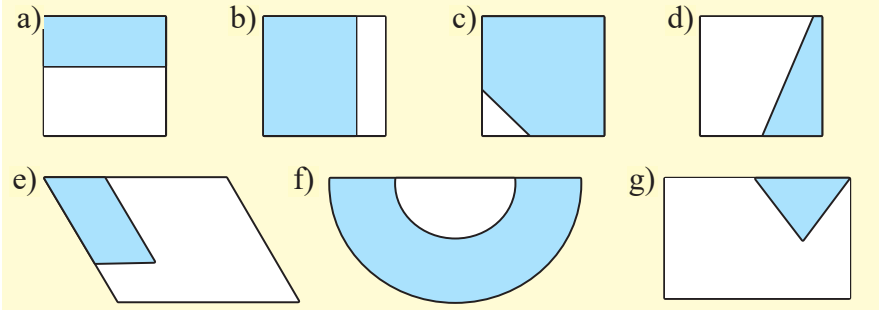
c) $\frac{9}{10}\times 100\% = 90\%$

d) $\frac{1}{4}\times 100\% = 25\%$

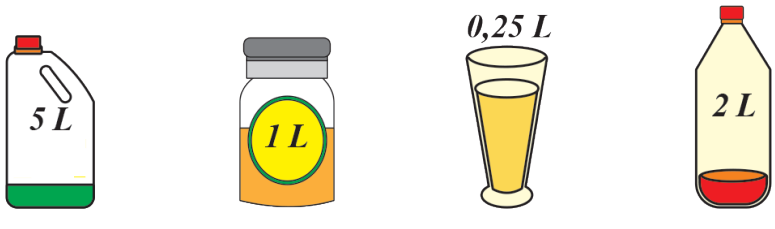
e) $\frac{2}{9}\times 100\% = 22,(2)\% \approx 20\%$

g) $\frac{1}{8}\times 100\% = 12,5\% \approx 10\%$

f) $\pi r^2 - \frac{\pi r^2}{4} = \frac{3\pi r^2}{4} = \frac{3}{4}\times 100\% = 75\%$

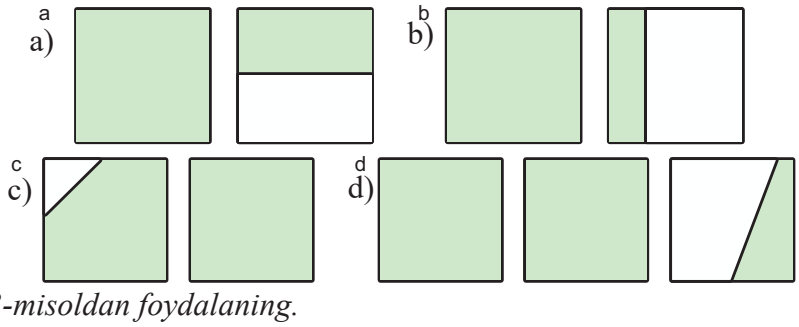


4. Idishlarning necha foizi to‘ldirilgan? Javobni eng yaqin 10 % gacha aniqlikda yaxlitlang.



Ko‘rsatma: *3-misoldan foydalaning.*

5. Shakllarning taxminan necha foizi bo‘yalgan? Javobni eng yaqin 10 % gacha aniqlikda yaxlitlang.



Ko‘rsatma: *3-misoldan foydalaning.*

6*. Son 10 % ga, keyin natija yana 10 % ga oshirildi. Son jami necha foizga oshirildi?

Yechish: 1-usul.

1) $x+\frac{x\times 10\%}{100\%}=x+\frac{x}{10}=\frac{11x}{10}$ 2) $\frac{11x}{10}+\frac{11x\times 10}{10\times 100}=\frac{11x}{10}+\frac{11x}{100}=\frac{121x}{100}$

3) $\frac{121x}{100}-\frac{100x}{100}=\frac{21x}{100}$ **Javob:** jami 21 % ga oshirildi.

7*. Son 10 % ga oshirildi, natija 10 % ga kamaytirildi. Son necha foizga o‘zgardi?

Yechish: 2-usul.

1) son avval 10 % ortgan $\frac{p}{100}\times(100+10)$ ifoda bilan topamiz. $1{,}1p$ son hosil bo‘ladi.

2) keyin u 10 % kamaygan, uni $\frac{1{,}1p}{100}\times(100-10)$ ifoda bilan topsak $0{,}99p$ ga teng bo‘ladi.

3) demak berilgan son $p-0{,}99p=0{,}01p=\frac{p}{100}\times 1$, ya’ni 1 % ga kamaygan.

Javob: 1 % ga kamaygan.

8. Vali gazetadan so‘nggi 3 oy ichida oziq-ovqat narxi oyiga o‘rtacha 10 % ga oshganini o‘qidi. 3 oy ichida narxlar qanchaga oshdi?

1) $x+\frac{x}{10}=\frac{11x}{10}$ 2) $\frac{110x}{100}+\frac{11x}{100}=\frac{121x}{100}$ 3) $\frac{1210x}{1000}+\frac{121x}{1000}=\frac{1331x}{1000}$

Javob: 3 oy ichida narxlar 33,1 % ga oshdi.

9. Model asosida noma’lumni toping.

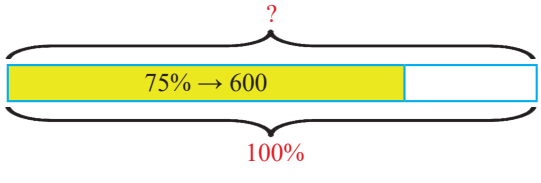
Yechish:

100 % $\longrightarrow$ x

75 % $\longrightarrow$ 600

$x = (600 \times 100\ \%) \div 75\ \% = 800.$

Javob: 800



10. 10 % li tuzli eritma uchun 600 g suv ishlatiladi, 15 % li tuzli eritma uchun necha g suv kerak?

Yechish: $\frac{10\%}{600}=\frac{15\%}{x}$ $x=\frac{600\times 15\%}{10\%}=900$. **Javob:** 900 g suv kerak.

11. Tarkibida 20 % qand bo‘lgan eritma olish uchun tarkibida 30 % i shakar bo‘lgan 120 g li eritmaga necha g suv qo‘shish kerak?

Yechish: $\frac{20\%}{x}=\frac{30\%}{120}\ \rightarrow\ x=\frac{120\times 20\%}{30\%}=80$

Javob: 80 g suv qo‘shish kerak.

12. Tomat pastasini olish uchun pomidor pyuresi massasi maxsus mashinalarda bug‘lanadi. Tarkibida 95 % suv bo‘lgan 28 tonna pyure tomat pastasidan 30 % i suv bo‘lgan qancha tomat pastasi olinadi?

Yechish:

28 tonna $\longrightarrow$ 100 %

t tonna $\longrightarrow$ 5 %

$$t = \frac{28 \times 5}{100} = \frac{28}{20} = \frac{7}{5} \text{ tonna.}$$

x tonna $\longrightarrow$ 100 %

$\frac{7}{5}$ tonna $\longrightarrow$ 70 %

$$x = \frac{700}{5 \times 70} = 2 \text{ tonna.}$$

Javob: 2 tonna

13. 40 t rudadan tarkibida 6% aralashmalar bo‘lgan 20 t metall eritildi. Ruda tarkibidagi aralashmalar necha foizni tashkil qiladi?

Yechish: Hammasi bo‘lib 40 t ruda bor. Shundan 20 t metallni ajratib olinsa va uning tarkibida 6 % aralashma bor bo‘lsa, bu aralashma 20 × 0,06=1,2 t tashkil etadi. Shu 1,2 t aralashma 40 t rudaning necha foizi ekanini topish kerak. $\frac{1,2}{40} \times 100 = \frac{12}{400} \times 100 = \frac{12}{4} = 3\%$ ni tashkil etar ekan.

Javob: 3 %

14. Do‘konda mahsulotni narxi 10% oshirilgandan so‘ng, sotuv hajmi 10% kamaydi. Do‘kon mahsulotlarni narxini oshirgandan so‘ng foyda ko‘radimi, zararmi? Necha foiz?

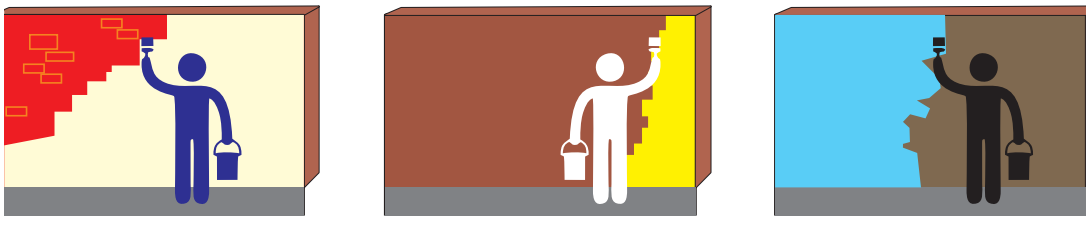
Yechish: m mahsulot narxi bo‘lsin. n sotuv xajmi. Umumiy savdo jarayoni $m \times n$ bo‘ladi.

Mahsulot narxi 10 % ga oshirilsa 1,1m so‘m bo‘ladi. Savdo xajmi esa 10 % kamaysa, u 0,9n bo‘ladi.

Bundan savdo jarayonini hisoblasak $(1,1m) \times (0,9n) = 0,99 \times m \times n$ bo‘ladi. Bundan savdo jarayoni 1 % ga kamayganini ko‘rish mumkin. Demak, do‘kon 1 % zarar ko‘radi.

Javob: 1 %.

15. Devorlarning taxminan necha foizi bo‘yalmagan? Javobni eng yaqin 10% gacha aniqlikda yaxlitlang.



Javob: 1-ishchi. och sariq ranga bo‘yashda 80 % qismi bo‘yalgan
2-ishchi. Sariq ranga bo‘yashda 18 % qismi bo‘yalgan
3-ishchi. Ko‘k ranga bo‘yashda 50 % qismi bo‘yalgan.

To‘g‘ri va teskari proporsional miqdorlar

Barcha o‘quvchilar	To‘g‘ri va teskari proporsional miqdorlar haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	To‘g‘ri va teskari proporsional miqdorlarni yaxshi tushunadi, ularga doir misollarga tatbiq eta oladi.
Ba’zi o‘quvchilar	To‘g‘ri va teskari proporsional miqdorlarni yaxshi tushunadi va ularni murakkab masalalarga va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Foiz nima?
2. 45 ning 30 foizi nechaga teng?
3. To‘g‘ri proporsional miqdor nima?
4. Teskari proporsional miqdor nima?
5. To‘g‘ri va teskari proporsional miqdorlarning farqini ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar to‘g‘ri va teskari proporsional miqdorlarni farqlashda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda taqdimotlar qilishi kerak.

➢ *Uyga vazifa*

11-, 13-misollar (193-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. 5 metr matoning narxi 120 ming so‘m bo‘lsa, 7 metr matoning narxi necha so‘m bo‘ladi?

Proporsiya tuzamiz:

5 m mato ——— 120 ming so‘m

7 m mato ——— x ming so‘m

$$\frac{5}{7}=\frac{120}{x} \rightarrow x=\frac{120\times 7}{5}=168$$

Javob: 7 m matoning narxi 168 ming so‘m bo‘ladi.

2. Samolyot 840 km/h tezlik bilan A shahardan B shaharga 7 soatda uchib bordi. Agar samolyotning tezligi 980 km/h bo‘lsa, u A shahardan B shaharga necha soatda uchib boradi?

Proporsiya tuzamiz:

840 km/h ——— 7 soat

980 km/h ——— x soat

$$\frac{840}{980}=\frac{x}{7} \rightarrow x=\frac{840\times 7}{980}=6$$

Javob: 6 soatda uchib boradi.

3. 135 metr uzunlikdagi simni 6 : 3 nisbatda qismlarga ajrating.

Yechish: 1) $\frac{135}{6+3}\times 6=90$ 2) $\frac{135}{6+3}\times 3=45$

Javob: 90 va 45.

4. 231 sonini 3 : 7 : 11 nisbatda to‘g‘ri proporsional qismlarga ajrating.

Yechish: 1) $\frac{231}{3+7+11}\times 3=33$ 2) $\frac{231}{3+7+11}\times 7=77$ 3) $\frac{231}{3+7+11}\times 11=121$

Javob: 33, 77, 121.

5. Ishchi 2 soatda 100 ta detal tayyorlaydi. Shunday mehnat unumdorligi bilan u 4 soatda nechta detal tayyorlaydi?

Yechish: 1) $\frac{x}{4}=\frac{100}{2}$ 2) $x=\frac{4\times 100}{2}=200$

Javob: 4 soatda 200 ta detal tayyorlaydi.

6. Qo‘yilgan omonat uchun bank yiliga 15% foyda ajratadi. Omonatchi bir yilda 75 000 000 so‘m foyda ko‘rgan bo‘lsa, u bankka necha so‘m pul qo‘ygan?

Yechish: $\frac{x\times 15}{100}=75000000$ $x=\frac{75000000\times 100}{15}=500000000$

Javob: omonatchi bankka 500 000 000 so‘m pul qo‘ygan.

7. 4 ta ishchi belgilangan ishni 15 kunda tugatadi. Shu ishni 12 kunda tugatish uchun yana nechta ishchi kerak bo‘ladi?



Javob: 5 ta ishchi 12 kunda tugatadi.

8. Jadvalni to‘ldiring. v = 10 km/h

t,soat	2	4	12
S,km	20	40	120

9. 3 ta sonning nisbati 2 : 3 : 8 kabi, yig‘indisi esa 67,6 ga teng. Shu sonlarni toping.

Yechish: 1) $\frac{67,6}{2+3+8}\times 2=10,4$ 2) $\frac{67,6}{2+3+8}\times 3=15,6$

3) $\frac{67,6}{2+3+8}\times 8 = 41,6$ **Javob:** 10,4; 15,6; 41,6.

10. 100 ta qush 100 kunda 100 kg don yeydi. 10 ta qush 10 kunda necha kg don yeydi?

Yechish: $\frac{100}{10}\times\frac{100}{10}=\frac{100}{x} \Rightarrow x=\frac{100}{100}=1$

100	10
100	10
100	x

Javob: 10 ta qush 10 kunda 1 kg don yeydi.

11. Uzunligi 35 m, massasi 840 g bo‘lgan mis simdan 24,5 m sim qirqib olindi. Qolgan sim bo‘lagining massasi qancha?

Yechish: $\frac{840}{35}=\frac{x}{24,5} \rightarrow x=\frac{12\times 245}{5}=588 \rightarrow 840-588=252$

Javob: 252 g.

13. 12 ta ishchi ma’lum miqdordagi ishni 8 soatda bajaradi. Xuddi shu ishni 6 soatda bajarish uchun nechta ishchi kerak?

Yechish: Teskari proporsional miqdorlar bo‘yicha proporsiya tuzamiz.

12 ta ishchi ——— 8 soat

x ta ishchi ——— 6 soat

$x = 8 \times 12 \div 6 = 16$.

Javob: 16 ta ishchi kerak.

LOYIHA ISHI

CHEGIRMALAR MAVSUMI

Chegirmalar mavsumida qator kiyim-kechak do‘konlarida 5%, 10%, 20%, 30% li chegirmalar e’lon qilindi.

Mahalliy mahsulotlar	30% – 50%
Xorijiy mahsulotlar	5% – 20%



Lola ko‘ylak, sumka, poyabzal xarid qilish niyatida do‘konlarni aylandi. O‘ziga chegirmalari 30% li ko‘ylak, 15% li poyabzal, 10% li sumka tanladi.

1-savol. Lola qanday mahsulotlarni tanladi (mahalliy yoki xorijiy)?

Mahsulot	Mahalliy	Xorijiy
Ko‘ylak		
Sumka		
Poyabzal		

2-savol. Lola jami necha so‘mlik xarid qildi? Javobingizni asoslang.

3-savol. Agar Lola va singlisi do‘konga 1 200 000 so‘m bilan borgan bo‘lsa, singlisiga yuqoridagi mahsulotlardan qaysilarini xarid qila oladi?

	Poyabzal	Ko‘ylak	Sumka
Mahalliy			
Xorijiy			

Summativ baholash. 7-nazorat ishi

1-variant

1. Proporsiyaning chetki hadlari 3,2 va 0,5 ga teng. O‘rta hadlaridan biri 0,8 ga teng. Proporsiyaning ikkinchi o‘rta hadini toping.

2. 18 ning 20 foiziga 26 ning 40 foizini qo‘shing.

3. 15 foizi 45 ga teng bo‘lgan sonni 15 foizi 9 ga teng songa bo‘ling.

4. Avtomobil soatiga 80 km tezlik bilan 6 soatda bosib o‘tgan masofasini 8 soatda bosib o‘tishi uchun qanday tezlik bilan yurishi kerak?

5. Tenglamani yeching. $(x + 27) \div 22 = 3 \div 4$

2-variant

1. Proporsiyaning o‘rta hadlari 3,6 va 3 ga teng. Agar uning chetki hadlaridan biri 2,7 ga teng bo‘lsa, shu sonlarni toping.

2. 12 ning 40 foiziga 4 ning 80 foizini qo‘shing.

3. 24 foizi 96 ga teng bo‘lgan sonni 33 foizi 66 ga teng songa bo‘ling.

4. Usta 18 ta detal tayyorlaganda shogirdi undan 6 ta kam detal tayyorlaydi. Usta 108 ta detal tayyorlaganda uning shogirdi nechta detal tayyorlaydi?

5. Tenglamani yeching. $(9 - x) \div 28 = 3 \div 7$

VIII BOB. IFODA VA TENGLAMALAR

Sonli va harfiy ifodalar

Barcha o‘quvchilar	Sonli va harfiy ifodalar haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Sonli va harfiy ifodalarga oid misollarni yaxshi tushunadi, ularga doir misollar yecha oladi.
Ba’zi o‘quvchilar	Sonli va harfiy ifodalarni yaxshi tushunadi, ularni murakkab masalalar va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1) Qanday ifodalar “sonli ifodalar” deyiladi?

2) Harfiy ifodalarga misol ayting.

3) Ifodaning qiymati deganda nima nazarda tutiladi?

4) Agar xarita masshtabi 1:50 bo‘lsa, xaritadagi 5 cm haqiqiy o‘lchamda qancha masofaga to‘g‘ri keladi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda harfiy ifodalarda harflar o‘rniga son qo‘yishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuga doir taqdimotlar, savollar, tarqatmalar tayyorlashi, hayotda bu miqdorlarning kerakligini isbotlab berishi lozim.

➢ *Uyga vazifa*

18-, 19-, 20-misollar (202-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Ishchi 2 soat ishladi. U birinchi soatda 12 dona, ikkinchi soatda esa birinchi soatdagidan m dona ko‘p detal tayyorladi. Ishchi ikki soatda tayyorlagan detallar sonini ifodalaydigan harfiy ifoda tuzing. Harfiy ifodada m ning a) 4 ga; b) 8 ga teng bo‘lgandagi qiymatini toping.

Harfiy ifoda	m	Sonli ifoda	Natija
$12 + (12 + m)$	4	$12 + (12 + 4)$	28
$12 + (12 + m)$	8	$12 + (12 + 8)$	32

2. Sonli ifodaning qiymatini toping.

a) $13 \times (-5) + 98 = -65 + 98 = 33$

b) $127 + 108 \div (-3) - 24 = 127 - 36 - 24 = 67$

c) $12 \times (-8) + 88 \times (-8) = -96 - 704 = -800$

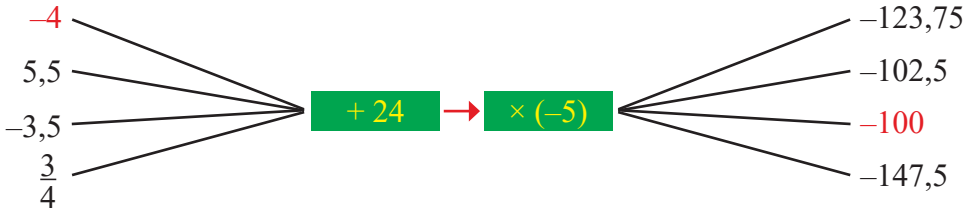
d) $13 \times (-88) + 13 \times 88 = 13 \times (-88 + 88) = 13 \times 0 = 0$

e) $5{,}5 \times (-23) + 4{,}5 \times 23 = 23 \times (-5{,}5 + 4{,}5) = 23 \times (-1) = -23$

f) $0{,}05 \times (-0{,}1) + 4{,}05 = -0{,}005 + 4{,}05 = 4{,}045$

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3. Chizma asosida sonli ifodalar tuzing va mos qiymatini toping.



Yechish: 1) $(-4) + 24 \times (-5) = -124$ 2) $5{,}5 + 24 \times (-5) = -114{,}5$

4. Azizada n ta CD disk bor edi. Unga o‘rtoqlari yana 5 ta disk sovg‘a qilishdi. Azizada jami qancha disk bo‘ldi?

Yechish: $n + 5$ ta.

5. Asal x yoshda, Sobir undan 8 yosh kichik. Sobirning yoshi qancha? Agar Asalning yoshi a) 10; b) 14; d) 16 ga teng bo‘lganda, Sobirning yoshi qancha bo‘lardi?

Berilgan: Asal x yoshda; Sobir $(x - 8)$ yoshda. $x = 10, 14, 16$.

Yechish: 1) $10 - 8 = 2$ 2) $14 - 8 = 6$ 3) $16 - 8 = 8$

6. Harfiy ifodaning qiymatini toping.

a) $128 - b$, bunda $b = 31; 43; 59$.

b) $b - 18$, bunda $b = 39; 124; 215$.

c) $35 + x$, bunda $x = 0; 10; 100$.

d) $125 - x$, bunda $x = 0; 110; 98$.

Yechish: 1) $128 - 31 = 97$; 2) $128 - 43 = 85$; 3) $128 - 59 = 69$.

Yechish: 1) $39 - 18 = 21$; 2) $124 - 18 = 106$; 3) $215 - 18 = 197$.

Yechish: 1) $35 + 0 = 35$; 2) $35 + 10 = 45$; 3) $35 + 100 = 135$.

Yechish: 1) $125 - 0 = 125$; 2) $125 - 110 = 15$; 3) $125 - 98 = 27$.

7. Ifodaning qiymati nimaga teng?

a) $(128 - 12b) + (14b - 18)$, bunda $b = 3; 4; 5$.

b) $(30y - 25) - (20y + 10)$, bunda $y = 4; 8; 10$.

Namuna: a) $b = 3$ bo‘lganda $(128 - 12b) + (14b - 18) = (128 - 12 \times 3) + (14 \times 3 - 18) =$
$= (128 - 36) + (42 - 18) = 92 + 24 = 116$.

8. Jadvalni to‘ldiring.

Harfiy ifoda	k	Sonli ifoda	Natija
$36 + (18 - 2k) \times (-5)$	-13	$36 + (18 - 2 \times (-13)) \times (-5)$	?
$12 \times (1{,}2 + k)$	$\frac{-5}{12}$	$12 \times \left(1{,}2 + \left(-\frac{5}{12}\right)\right)$	?

1) $36+(18-2k)\times(-5)$, $k=-13$.

Yechish: $36 + (18 - 2 \times (-13)) \times (-5) = 36 + 44 \times (-5) = 36 - 220 = -184$.

2) $12\times(1,2+k)$, $k=-\frac{5}{12}$.

Yechish:

$$12\times\left(1,2+\left(-\frac{5}{12}\right)\right)=12\times\left(\frac{12}{10}-\frac{5}{12}\right)=12\times\left(\frac{6\times12-5\times5}{60}\right)=12\times\left(\frac{72-25}{60}\right)=12\times\frac{47}{60}=\frac{47}{5}=9,4$$

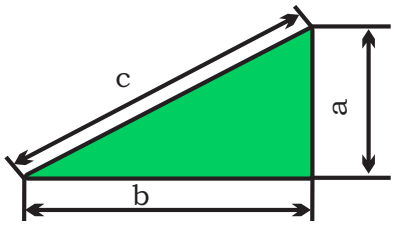
9. Duradgor uch kunda buyurtmani bajardi. U birinchi kuni 24 ta, ikkinchi kuni birinchi kundagidan a ta ko‘p, uchinchi kuni esa ikkinchi kundagidan 4 ta kam stul yasadi. a = 8; 10; 12 qiymatlarda duradgor jami nechta stul yasagan?

Berilgan: 1-kun: 24 ta; 2-kun: $(24 + a)$ ta; 3-kun: $(24 + a - 4)$ ta.

Yechim:

a = 8; 10; 12 2-kun: $(24 + a) = 24 + 8 = 32$ ta. $(24 + a - 4) = 32 - 4 = 28$ ta.

10. Chizmadagi uchburchakning perimetri va yuzini a = 5 cm, b = 12 cm va c = 13 cm bo‘lganda hisoblang.



Berilgan: $a=5$ cm, $b=12$ cm, $c=13$ cm.

Topish kerak: p = ? S = ?

Yechish: $p = a + b + c = 5 + 12 + 13 = 30$ cm.

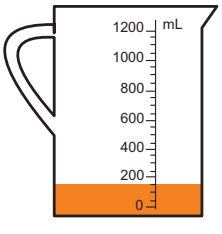
$$S=\frac{1}{2}ab=\frac{1}{2}\times5\times12=30\text{ cm}^2.$$

11. Nozima onasi uchun meva sharbati tayyorladi. U mikserga ko‘rsatilgan miqdorda apelsin sharbati, undan k marta ko‘p olma sharbatini quydi. Nozima tayyorlamoqchi bo‘lgan sharbat necha millilitrga teng bo‘ldi? Masala shartiga mos harfiy ifoda tuzing va k = 6 bo‘lgandagi qiymatini toping.

Berilgan: apelsin $\rightarrow$ 150 ml; olma $\rightarrow$ $150\times k$ ml; $k=6$.

Topish kerak: apelsin + olma = $150 + 150 \times k$ = ?

Yechish: $150 + 150 \times 6 = 150 + 900 = 1050$.



12. Agar kamayuvchi 4 ga, ayriluvchi esa 16 ga kamaytirilsa, ayirma qanday o‘zgaradi?

Berilgan: $x-y=z$, (bu yerda $x\rightarrow$ kamayuvchi; $y\rightarrow$ ayriluvchi; $z\rightarrow$ ayirma);

Shartga ko‘ra: $(x - 4) - (y - 16) = z$ $x - 4 - y + 16 = z$ $x - y = z - 12$.

Javob: ayirma 12 ga ortadi.

13. Kamayuvchi 24 ga orttirilsa, ayriluvchi 15 ga kamaytirilsa, ayirma qanday o‘zgaradi?

Berilgan: $x - y = z$, (bu yerda $x \rightarrow$ kamayuvchi; $y \rightarrow$ ayriluvchi; $z \rightarrow$ ayirma)

Shartga ko‘ra: $(x + 24) - (y - 15) = z$ $\quad x + 24 - y + 15 = z$ $\quad x - y = z - 39$.

Javob: ayirma 39 ga ortadi.

14. Qulay usulda hisoblang.

a) $321 \times 1001 = (320 + 1) \times (1000 + 1) = 320 \times 1000 + 320 \times 1 + 1 \times 1000 + 1 \times 1 =$
$= 320000 + 320 + 1000 + 1 = 321321$

b) $478 \times 1001 = (470 + 8) \times (1000 + 1) = 470 \times 1000 + 470 \times 1 + 8 \times 1000 + 8 \times 1 =$
$= 470000 + 470 + 8000 + 8 = 478478$

c) $905 \times 1001 = (900 + 5) \times (1000 + 1) = 900 \times 1000 + 900 \times 1 + 5 \times 1000 + 5 \times 1 =$
$= 900000 + 900 + 5000 + 5 = 905905$

15. Qulay usul bilan hisoblang.

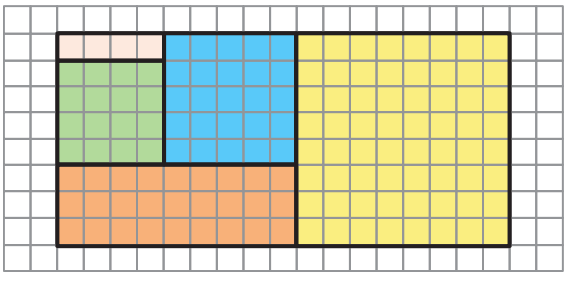
a) $(4{,}95 - 2{,}45) + (3{,}275 - 4{,}95) = 4{,}95 - 2{,}45 + 3{,}275 - 4{,}95 = 3{,}275 - 2{,}45 = 0{,}825$;

b) $(-3\,321 + 601) - (21 - 9) - (-1\,003) = -1729$

c) $-(9{,}75 + 0{,}25) - (8{,}05 - 1{,}3) = -10 - 6{,}75 = -16{,}75$

d) $\left(6\frac{13}{18} - 4{,}2\right) - \left(2\frac{12}{18} - 1{,}2\right) = 6\frac{13}{18} - 4{,}2 - 2\frac{12}{18} + 1{,}2 = 4\frac{1}{18} - 3 = \frac{4 \times 18 + 1}{18} - 3 = \frac{73}{18} - 3 = \frac{73 - 3 \times 18}{18} =$
$= \frac{73 - 54}{18} = \frac{19}{18} = 1\frac{1}{18}$

16. Quyidagi shaklda har bir katak a millimetrga teng. Har bir shaklning perimetrini hamda barcha shakllar perimetrining yig‘indisini toping. Masala shartiga mos harfiy ifoda tuzing va $a = 5$ mm da hisoblang.



Yechish: $P_1 = 2 \times (4a + 1a) = 2 \times (4 \times 5 + 1 \times 5) = 50$ mm;

$P_2 = 2 \times (4a + 4a) = 2 \times (4 \times 5 + 4 \times 5) = 80$ mm;

$P_3 = 2 \times (5a + 5a) = 2 \times (5 \times 5 + 5 \times 5) = 100$ mm;

$P_4 = 2 \times (3a + 9a) = 2 \times (3 \times 5 + 9 \times 5) = 120$ mm;

$P_5 = 2 \times (8a + 8a) = 2 \times (8 \times 5 + 8 \times 5) = 160$ mm;

$P_1 + P_2 + P_3 + P_4 + P_5 = 50 + 80 + 100 + 120 + 160 = 510$ mm.

Shak perimetri $P = 2 \times (8a + 17a) = 2 \times (8 \times 5 + 17 \times 5) = 250$ mm.

17. Ifodaning qiymatini toping.

a) $12a + 51b$, bunda $a = 11$ va $b = 23$ **Yechish:** $12\times11+51\times23=132+1173=1305$

b) $59p - 23q$, bunda $p = 13$ va $q = 22$ **Yechish:** $59\times13-23\times22=767-506=261$

19. Harfiy ifodaning qiymatini toping.

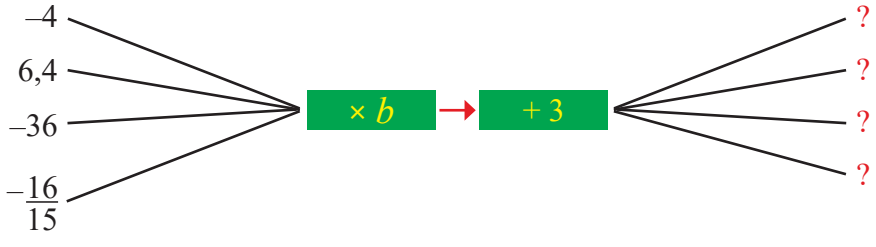
a) $28 - c$, bunda $c = 12; 24$

Yechish: $c=12 \Leftrightarrow 28-12=16$; $c=24 \Leftrightarrow 28-24=4$.

b) $d - 109$, bunda $d = 139; 523$

Yechish: $d=139 \Leftrightarrow 139-109=30$; $d=523 \Leftrightarrow 523-109=414$.

20. Chizma asosida harfiy ifoda tuzing va uning $b = \frac{3}{8}$ bo‘lgandagi qiymatini toping.



Berilgan: $b=\frac{3}{8}$.

1) $-4\times b+3=-4\times\frac{3}{8}+3=-\frac{3}{2}+3=-1,5+3=1,5$

2) $6,4\times b+3=\frac{64}{10}\times\frac{3}{8}+3=\frac{12}{5}+3=2\frac{2}{5}+3=5\frac{2}{5}$

3) $-36\times b+3=-36\times\frac{3}{8}+3=-\frac{27}{2}+3=-\frac{27}{2}+\frac{6}{2}=-\frac{21}{2}=-10\frac{1}{2}$

4) $-\frac{16}{25}\times b+3=-\frac{16}{25}\times\frac{3}{8}+3=-\frac{6}{25}+3=-\frac{6}{25}+\frac{75}{25}=\frac{69}{25}=2\frac{19}{25}$

Tengliklar va ularning xossalari

Barcha o‘quvchilar	Tengliklar va ularning xossalari haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Tengliklar va ularning xossalariga oid misollarni yaxshi tushunadi, misollarga tatbiq eta oladi.
Ba’zi o‘quvchilar	Tengliklar va ularning xossalarini yaxshi tushunadi, ularni murakkab masalalar va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Tenglik nima?
2. Tenglikda qanday ifoda qanday amal bilan bog‘lanadi?
3. Tenglikka misol ayting.
4. Tenglikning xossalarini ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda tengliklarni hadma-had ko‘paytirishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuga oid taqdimotlar, savollar, tarqatmalar tayyorlashi, hayotda tengliklarning kerakligini isbotlab berishi lozim.

➢ *Uyga vazifa*

16-, 17-, 18-misollar (205-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Ifodalarning tengligini tekshiring.

a) $3 \times 11 = 33$ $33 = 33$ **Javob:** to‘g‘ri tenglik

b) $48 \div 6 = -8 \div (-1)$ $8 = 8$ **Javob:** to‘g‘ri tenglik

c) $91 \times 2{,}08 + 9 \times 2{,}08 = 2{,}08 \times (91 + 9)$ $208 = 208$ **Javob:** to‘g‘ri tenglik

2. Tengliklarning ikkala qismiga 0,2; –5,5 va 44 ni qo‘shing.

a)

1) $-2{,}8 \times 2 + 0{,}2 = -7 \times 0{,}8 + 0{,}2 \rightarrow -5{,}4 = -5{,}4$

2) $-2{,}8 \times 2 + (-5{,}5) = -7 \times 0{,}8 + (-5{,}5) \rightarrow -11{,}1 = -11{,}1$

3) $-2{,}8 \times 2 + 44 = -7 \times 0{,}8 + 44 \rightarrow 38{,}4 = 38{,}4$

b)

1) $-0{,}011 \times 10 + 0{,}2 = 0{,}88 \div (-8) + 0{,}2 \rightarrow 0{,}09 = 0{,}09$

2) $-0{,}011 \times 10 + (-5{,}5) = 0{,}88 \div (-8) + (-5{,}5) \rightarrow -5{,}61 = -5{,}61$

3) $-0{,}011 \times 10 + 44 = 0{,}88 \div (-8) + 44 \rightarrow 43{,}89 = 43{,}89$

3. Berilgan 5,4 × 2 = 10,8 tenglikning ikkala qismini a) –3; b) 9; c) 6; d) 0,2 sonlariga bo‘lib, to‘g‘ri tenglik hosil qiling.

a) $(5,4\times 2)\div(-3)=10,8\div(-3)\Leftrightarrow -3,6=-3,6$

b) $(5,4\times 2)\div 9=10,8\div 9\Leftrightarrow 1,2=1,2$

c) $(5,4\times 2)\div 6=10,8\div 6\Leftrightarrow 1,8=1,8$

d) $(5,4\times 2)\div 0,2=10,8\div 0,2\Leftrightarrow 54=54$

4. Tengliklar to‘g‘ri bo‘lishi uchun bo‘sh kataklarni to‘ldiring.

a) –3 × [2] = –6 va –6 = [–2] – 4
–3 × [2] = [–2] – 4

b) [–0,66] × 5 = –3,3 va –3,3 = [–36,3] + 33
[–0,66] × 5 = [–36,3] + 33

5. Tengliklarni qo‘shing.

a) –9 ÷ 1,5 = –6 va 4 = 3,2 ÷ 0,8	–9 ÷ 1,5 + 3,2 ÷ 0,8 = –6 + 4	– 2 = – 2
b) 0,8 × (–7) = –5,6 va 1,2 × 5 = 6	0,8 × (–7) + 1,2 × 5 = –5,6 + 6	0,4 = 0,4

6. Tengliklarni hadma-had ko‘paytiring.

a) –19 + 24 = 5 va 54 ÷ 0,9 = 60	(–19 + 24) × (54 ÷ 0,8) = 5 × 60	300 = 300
b) 3 – 1,4 = 1,6 va 6,4 ÷ 4 = 1,6	(3 – 1,4) × (6,4 ÷ 4) = 1,6 × 1,6	2,56 = 2,56

7. To‘g‘ri tengliklarni aniqlang.

a) $6+3=1,8\times 5\Leftrightarrow 9=9$

b) $2,8-9=3,4\times 2\Leftrightarrow -6,2\neq 6,8$

c) $0,9\times 6=10-2,6\Leftrightarrow 5,4\neq 7,4$

d) $1,6-4=0,8\times 2+4\Leftrightarrow -2,4\neq 5,6$

8. Namuna asosida ifodalarning qiymatini toping va natijaga teng tenglik tuzing.

101 × 25 – 101 × 15 = 101 × (25 – 15) = 1010	1 010 = 202 × 5
a) 81 × 21 + 19 × 21 = 21 × (81 + 19) = 21 × 100 = 2100	2100 = 1701 + 399
b) 252 × 80 – 252 × 70 = 252 × (80 – 70) = 252 × 10 = 2520	2520 = 1260 × 2
c) 201 × 91 + 112 × 91 = 91 × (201 + 112) = 91 × 313 = 28483	28483 = 2191 × 13

9. $x + 12 = 43$ tenglikning ikkala qismiga 4 va –5 ni qo‘shing.

$x+12+4-5=43+4-5\leftrightarrow x=43-12\leftrightarrow x=31$

10. Kataklarni shunday to‘ldiringki, natijada to‘g‘ri tenglik hosil bo‘lsin.

a) $8-x=0,5\rightarrow x=8-0,5=7,5$

b) $4,5-y=1,5\rightarrow y=4,5-1,5=3$

c) $z+3,2=1\rightarrow z=1-3,2=-2,2$

d) $m\times 2,2=11\rightarrow m=11\div 2,2=5$

e) $0,4\times n=-8\rightarrow n=-8\div 0,4=-20$

f) $k\div(-99)=9\rightarrow k=-99\times 9=-891$

g) $p\div(-5)=45\rightarrow p=45\times(-5)=-225$

11. Tengliklarni ustun shaklida qo‘shing.

a) $-6 \div 1,5 = -4$ va $3 = 3,3 \div 1,1 \Leftrightarrow -6 \div 1,5 + 3 = -4 + 3,3 \div 1,1 \rightarrow -1 = -1$

b) $8 \times (-2) = -16$ va $1,5 \times 2 = 3 \Leftrightarrow 8 \times (-2) + 1,5 \times 2 = -16 + 3 \rightarrow -13 = -13$

c) $9 \div 0,3 = 30$ va $0,8 \div 2 = 0,4 \Leftrightarrow 9 \div 0,3 + 0,8 \div 2 = 30 + 0,4 \rightarrow 30,4 = 30,4$

d) $1,69 \div 0,13 = 13$ va $-54 \div 2 = -27 \Leftrightarrow 1,69 \div 0,13 + (-54 \div 2) = -27 + 13 \rightarrow -14 = -14$

12. $-10 + 44 = 34$ va $8,4 \div 2,1 = 4$ tengliklarni hadma-had ko‘paytiring.

$-10 + 44 = 34$ va $8,4 \div 2,1 = 4 \Leftrightarrow (-10 + 44) \times (8,4 \div 2,1) = 34 \times 4 \rightarrow 136 = 136$

13. Berilgan $-7 + 83 = 76$ tenglikning ikkala qismiga a) 13; b) –16; c) 4,3; d) $\frac{2}{5}$ sonlarini qo‘shib, to‘g‘ri tenglik hosil qiling.

a) $-7 + 83 + 13 = 76 + 13 \leftrightarrow 89 = 89$

b) $-7 + 83 - 16 = 76 - 16 \leftrightarrow 60 = 60$

c) $-7 + 83 + 4,3 = 76 + 4,3 \leftrightarrow 80,3 = 80,3$

d) $-7 + 83 + \frac{2}{5} = 76 + \frac{2}{5} \leftrightarrow 76\frac{2}{5} = 76\frac{2}{5}$

14. $-5 \times (-4,2) = 21$ tenglikning ikkala qismini 4 va –5 ga ko‘paytiring.

$-5 \times (-4,2) \times 4 \times (-5) = 21 \times 4 \times (-5) \leftrightarrow -420 = -420$

15. Berilgan $3,4 \times 3 = 10,2$ tenglikning ikkala qismini a) –1; b) 4; c) 6; d) 0,5 sonlariga ko‘paytiring va to‘g‘ri tenglik hosil qiling.

a) $3,4 \times 3 \times (-1) = 10,2 \times (-1) = -10,2$

b) $3,4 \times 3 \times 0,5 = 10,2 \times 0,5 = 5,1$

c) $3,4 \times 3 \times 6 = 10,2 \times 6 = 61,2$

d) $3,4 \times 3 \times 0,5 = 10,2 \times 0,5 = 5,1$

16. Tengliklarni ustun shaklida qo‘shing.

a) $7 \div 1,4 = 5$ va $0,6 \div 3 = 0,2$

b) $1,44 \div 0,12 = 12$ va $4,5 \times 10 = 45$

17. $1,4 + 1,5 \times 6 = 14 - 3,6$ tenglikning ikkala qismini a) 2; b) –2; c) 0,5 ga ko‘paytiring.

Dastlab tenglik to‘g‘riligini tekshiramiz.

a) 1-usul: tenglikning har ikki tomonini hisoblasak, 10,4 ga teng. Demak, to‘g‘ri tenglik.

$10,4 \times 2 = 10,4 \times 2 \rightarrow 20,8 = 20,8$

2-usul: $(1,4 + 1,5 \times 6) \times 2 = (14 - 3,6) \times 2$ ni hisoblash kerak.

O‘quvchilar yo‘l qo‘yishi mumkin bo‘lgan xato: $1,4 + 1,5 \times 6 \times 2 = 14 - 3,6 \times 2$. Bu holatda topshiriq xato bajarilgan bo‘ladi.

18. $3,4 + 1,5 \times 2 = 12 - 5,6$ tenglikning ikkala qismini a) 3; b) – 5; c) 0,2 ga ko‘paytiring.

Ko‘rsatma: *17-misoldan foydalaning.*

Tenglamalar

Barcha o‘quvchilar	Tenglama haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Tenglamani yaxshi tushunadi, misollarga tatbiq eta oladi.
Ba’zi o‘quvchilar	Tenglamani yaxshi tushunadi, murakkab masalalarga va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Tenglik nima?
2. Tenglikda qanday ifoda qanday amal bilan bog‘lanadi?
3. Tenglama nima?
4. Tenglikning xossalarini ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda tengliklarni hadma-had ko‘paytirish va masalaga tenglama tuzishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuga oid taqdimotlar, savollar, tarqatmalar tayyorlashi, hayotda tenglamaning kerakligini isbotlab berishi lozim.

➢ *Uyga vazifa*

19-, 21-misollar (207-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Tenglamani yeching.

a) $x + 12 = 3$
$x = 3 - 12$
$x = -9$

b) $x + 45 = 43$
$x = 43 - 45$
$x = -2$

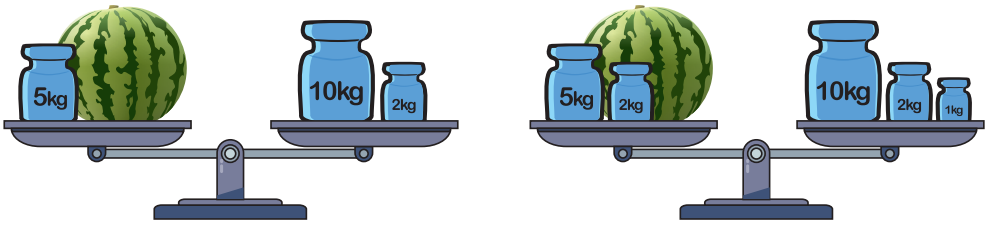
c) $x + 27 = -18$
$x = -18 - 27$
$x = -35$

d) $18 - x = 25$
$18 - 25 = x$
$x = -7$

e) $-x + 37 = -78$
$37 + 78 = x$
$x = 115$

f) $x + 45 = 43$
$x = 43 - 45$
$x = -2$

2. Tenglama tuzib, tarvuzning og‘irligini toping.



Tarvuzni x kg deb olamiz va quyidagicha tenglama tuzamiz.

1-tarozi: $5+x=10+2$

$x=10+2-5$

$x=7$

2-tarozi: $5+2+x=10+2+1$

$x=10+2+1-5-2$

$x=6$

3. Yechimi 3 ga, –3 ga, 5 ga va 0,3 ga teng bo‘lgan tenglamalar tuzing.

1) $x = 3$ bo‘lgan tenglama tuzamiz: $x + 1 = 4$

2) $x = –3$ bo‘lgan tenglama tuzamiz: $x + 4 = 1$

3) $x = 5$ bo‘lgan tenglama tuzamiz: $x – 2 = 3$

4) $x = 0{,}3$ bo‘lgan tenglama tuzamiz: $x + 5{,}7 = 6$

O‘quvchilar boshqa tenglamalar ham tuzishlari mumkin.

4. Tenglamani yeching.

a) $1{,}5x – 12 = 3$

$1{,}5x = 3 + 12$

$x = 10$

b) $22x + 45 = 43$

$22x = 43 – 45$

$x=-\frac{2}{22}=-\frac{1}{11}$

c) $9x+15=-21$

$9x=-21-15$

$x=-\frac{36}{9}=-4$

d) $28-7x=35$

$28-35=7x$

$x=-\frac{7}{7}=-1$

e) $-9x+27=-63$

$27+63=9x$

$x=\frac{90}{9}=10$

f) $36-14x=31$

$36-31=14x$

$x=\frac{5}{14}$

5. Tenglamalarni yeching.

a) $48+x=80-19$

$x=80-19-48$

$x=13$

b) $-30+x=-47-(-17)$

$x=-47+17+30$

$x=0$

c) $96 - x = 96 - (-33)$

$96 - 96 - 33 = x$

$x = -33$

d) $-71 - x = -49 + 21$

$-71 + 49 - 21 = x$

$x = -43$

e) $x + (-19) = -23 - (-19)$

$x = -23 + 19 + 19$

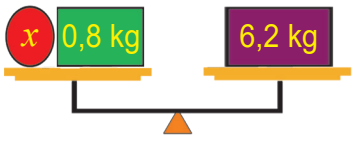
$x = 15$

f) $-x - (-28) = -21 + 53$

$28 + 21 - 53 = x$

$x = -4$

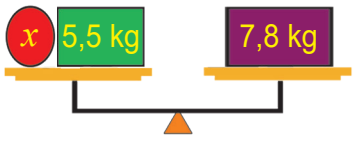
6. Noma'lum massani toping.



$x + 0,8 = 6,2$

$x = 6,2 - 0,8$

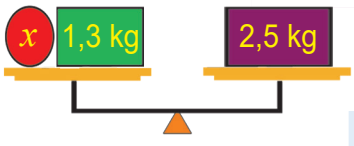
$x = 5,4$



$x + 5,5 = 7,8$

$x = 7,8 - 5,5$

$x = 2,3$



$x + 1,3 = 2,5$

$x = 2,5 - 1,3$

$x = 1,2$

7. Hisoblashning qulay usulini toping.

a) $6,96 \times 24 - 6,96 \times 14 = 6,96 \times (24 - 14) = 6,96 \times 10 = 69,6$

b) $53 \times 17 + 32 \times 17 = 17 \times (53 + 17) = 17 \times 70 = 1190$

c) $23 \times 99 - 23 \times 51 = 23 \times (99 - 51) = 23 \times 48 = 1104$

8. "?" belgisi o'rnini to'ldiring, natijada to'g'ri tenglik hosil bo'lsin.

a) $15 - x = 5$

$15 - 5 = x$

$x = 10$

b) $3,2 - x = 1$

$3,2 - 1 = x$

$x = 2,2$

c) $x + 42 = 17$

$x = 17 - 42$

$x = -25$

d) $x \times 5,2 = 10,4$

$x = 10,4 \div 5,2$

$x = 2$

e) $0,3 \times x = -9$

$x = -9 \div 0,3$

$x = -30$

f) $x \div (-11) = 7$

$x = 7 \times (-11)$

$x = -77$

9. Berilgan $-15 + 3 = -12$ tenglikning ikkala qismiga a) 7; b) –11; c) 3,2 sonlarini qo'shib, to'g'ri tenglik hosil qiling.

$-15 + 3 = -12$ ushbu tenglikning har ikki tarafiga bir xil sonni qo'shganimizda natija yana bir xil bo'laveradi.

a) $-12+7=-5$ b) $-12+(-11)=-23$ c) $-12+3,2=-8,8$

Dastlab tenglikning to‘g‘riligini tekshiramiz.

a) 1-usul: tenglikning har ikki tomonini hisoblasak, –12 ga teng. Demak, tenglik to‘g‘ri.

$-12+7=-12+7 \rightarrow -5=-5$

2-usul: $(-15+3)+7=(-12)+7$ ni hisoblash kerak.

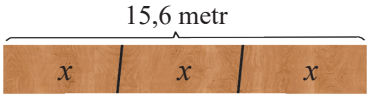
10. Yechimi 2 ga, –2 ga, 10 ga va 0,5 ga teng bo‘lgan tenglamalar tuzing.

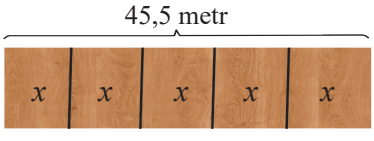
a) $x-5=-3$ b) $x-5=-7$

c) $x-5=5$ d) $x-5=-4,5$

11. Taxta bo‘laklari necha metrdan?







$2x=18m$
$x=18m\div 2$
$x=9m$

$3x=15,6m$
$x=15,6m\div 3$
$x=5,2m$

$5x=45,5m$
$x=45,5m\div 5$
$x=9,1m$

12. Tenglamaning to‘g‘ri yechimini toping.

1	$2x+3=-13$	A	4
2	$-4x+3=-13$	B	–2,5
3	$3,8-2x=40$	C	–8
4	$7,3-2x=12,3$	D	–9
5	$15x+121=-14$	E	–18,1
6	$7x=-20+(-29)$	F	–7

Ko‘rsatma: *bir xil ranglar to‘g‘riligini bildiradi.*

13. Yechimi 4 ga, –5 ga, 6 ga va 0,2 ga teng bo‘lgan tenglamalar tuzing.

$x-1=3$ $x+5=0$ $x+2=8$ $x+2,8=3$

14. Biror sonning 20 bilan farqi o‘sha sonning 32 bilan farqiga teng. Bu son qaysi?

$32-x=x-20$

$32+20=2x$

$x=26$

15. Barnoning mushuklari va jo‘jalari soni teng. Barno uy hayvonlarining oyoqlarini

sanaganda, jami 48 ta chiqdi. Barnoning nechta jo‘jasi bor?

$2x + 4x = 48$

$6x = 48$

$x = 8$

Javob: jo‘jalar soni 8 ta.

16. Malika va Ra’no archani bezatish uchun qog‘ozdan qushchalar yasadi. Malika yasagan qushchalar soni Ra’nonikidan 8 taga ko‘proq. Agar qizlar jami 26 ta bezak yasagan bo‘lsa, Ra’no yasagan bezaklar sonini toping.

$x + (x + 8) = 26$

$2x = 18$

$x = 9$

Javob: Ra’noning bezaklari 9 ta.

17. Qulupnay juda foydali bo‘lib, uning 100 grammida 60 mg C vitamini mavjud. 6-sinf o‘quvchisi organizmi uchun 1 sutkada 100 mg C vitamini kerak bo‘ladi. Kumushbibi 200 g qulupnayni yeb tugatdi.

Savol: Kumushbibi shu yegan qulupnayi orqali o‘zi uchun kunlik C vitamini miqdorini oladimi?

Javob: 20 mg ortig‘i bilan oladi.

18. Tenglamani yeching.

a) $10 \times x - 4{,}82 = 12{,}6$

$10x = 12{,}6 + 4{,}82$

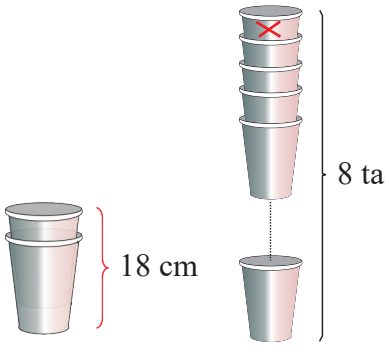
$x = 17{,}42 \div 10 = 1{,}742$

b) $0{,}394 + 100 \times x = 5$

$100x = 5 - 0{,}394$

$x = 4{,}606 \div 100 = 0{,}04606$

20. Rasmda tasvirlangan ustma-ust qo‘yilgan 8 ta tuvakning balandligi 42 cm, 2 ta tuvakning balandligi 18 cm bo‘lsa, ustma-ust qo‘yilgan 6 ta tuvakning balandligi qancha bo‘ladi?



Yechish: 1) ustma-ust 8 ta tuvakning 2 tasi 18 cm. Bir-biriga kirgan 6 tasi necha santimetr ekanini topish talab etiladi (*rasmdagi qizil belgiga qarang*).

8 tasi 42 cm, 2 tasi 18 cm ekanidan 6 tasi 42 – 18 = 24 cm ekanini topamiz.

Har birining ichiga kirgandagi balandligi 24 ÷ 6 = 4 cm bo‘ladi.

Demak, ustma-ust qo‘yilgan 6 ta tuvakning 2 tasi 18 cm, 4 tasi esa har biri 4 cm dan bo‘lganda 16 cm bo‘ladi. Bularni qo‘shamiz: 18 + 16 = 34 cm.

21. Men bir son o‘yladim. Agar uni 2 ga ko‘paytirib, hosil bo‘lgan ko‘paytmani 8 ga bo‘lib, bo‘linmaga 20 ni qo‘shib, yig‘indidan 15 ni ayirsam, 10 hosil bo‘ladi. Men o‘ylagan sonni toping.

Tenglama tuzamiz: $((x \times 2 \div 8) + 20) - 15 = 10$. Bundan $x = 20$ ekani kelib chiqadi.

Iqtisodiy mazmundagi masalalar

Barcha o‘quvchilar	Iqtisodiy mazmundagi masalalar haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Iqtisodiy mazmundagi masalalarni yaxshi tushunadi, ularni hayotga tatbiq eta oladi.
Ba’zi o‘quvchilar	Iqtisodiy mazmundagi masalalarni yaxshi tushunadi, ularni murakkab masalalar va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Tenglama nima?
2. Iqtisodiy mazmundagi masalalar deganda qanday masalalarni tushunasiz?
3. Iqtisodiy mazmundagi masalalarga misollar ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda iqtisodiy mazmundagi masalalar tuzishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda hayotdan misollar keltirishi, o‘quvchilarga shunday masalalar tuzishni o‘rgatishi, pul tejash uchun nimalarga e’tibor berishi zarurligi to‘g‘risida taqdimotlar qilishi kerak. Buyumlar va uy anjomlarini toza tutish, isrofgarchilikning oldini olishga doir savollar, tarqatmalar tayyorlashi, iqtisodiy mazmundagi masalalar hayotda juda kerakligini isbotlab berishi lozim.

➢ *Uyga vazifa*

16-, 17-, 18-misollar (210-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Masalaning yechish usullarini tahlil qiling va xulosangizni bildiring.

Oromgohda 342 nafar bola bor. U yerda har bir bola uchun bir kunda 60 g shakar beriladi. Bir kun bolalarni shakar bilan ta’minlash uchun bir kilogrammlik shakar paketlaridan kamida nechta kerak bo‘ladi? Agar shakarning narxi 8300 so‘m bo‘lsa, bir kunda oromgohda necha so‘mlik shakar ishlatiladi?

1) Jami necha kilogramm shakar kerak?

$60 \times 342 = 20\,520 = 20$ kg 520 g

20 kg 520 g = 20 520 g

20 520 g ÷ 1000 = 20 ta paket + 520 g ham 1 ta paket bo‘lsa, 21 ta paket.

2) Berilgan:

$n = 21$

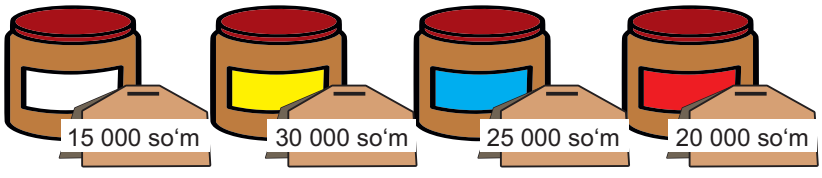
$p = 8\,300$ $\qquad c = p \times n = 8\,300 \times 21 = 174\,300$ (so‘m)

$c = ?$

2. Masala shartini to‘ldiring va yeching.

Do‘konda bir xil bo‘yoqdan 3 yoki undan ko‘p banka sotib olinsa, sotib olingan har bir banka bo‘yoq narxi $\frac{1}{5}$ qismiga kamaytirilishi e’lon qilindi.

Agar oila ... banka bo‘yoq sotib olsa, necha so‘m mablag‘ tejab qoladi?



Yechish:

$15\,000 \times \frac{1}{5} = 3\,000$ – oq bo‘yoq xarid qilinganda har bir bankadan 3000 so‘mdan tejaladi.

$30\,000 \times \frac{1}{5} = 6\,000$ – sariq bo‘yoq xarid qilinganda har bir bankadan 6000 so‘mdan tejaladi.

$25\,000 \times \frac{1}{5} = 5\,000$ – ko‘k bo‘yoq xarid qilinganda har bir bankadan 5000 so‘mdan tejaladi.

$20\,000 \times \frac{1}{5} = 4\,000$ – qizil bo‘yoq xarid qilinganda har bir bankadan 3 000 so‘mdan tejaladi.

Agar oila 4 banka bo‘yoq sotib olsa, 3000 + 6000 + 5000 + 4000 = 18000 so‘m mablag‘ tejaladi.

3. Maktabda har kuni 600 ta 0,5 litrli suv sotiladi. Suvning narxi 1200 so‘m bo‘lsa, jami qancha savdo qilinadi? Suv 1500 so‘m bo‘lsa-chi?

Yechish:

600 × 1200 = 720 000 so‘m savdo qilinadi.

600 × 1500 = 900 000 so‘m bo‘ladi.

4–5. Masalalar yechimini tahlil qilib, xulosangizni bildiring.

12 kg olma uchun jami 72 000 so‘m to‘landi. Olmaning narxi qancha?

Berilgan:

$n = 12$ kg

$c = 72\,000$ so‘m

$p = ?$

$p = c \div n = 72\,000 \div 12$

$p = 6\,000$ (so‘m)

Oromgohda har bir bola uchun kuniga 20 g sariyog‘ beriladi. Oromgohda 456 ta bola bor. Bir kunda bolalarni sariyog‘ bilan ta’minlash uchun uch kilogrammlik sariyog‘ bo‘laklaridan kamida nechta kerak bo‘ladi?

1) Jami necha kilogramm sariyog‘ kerak?

456 × 20 = 9 120 g

2) Berilgan:

$c = 9\,120$

$p = 3\,000$

$n = ?$

$n = c \div p = 9\,120 \div 3\,000 = 3$ (120 qoldiq)

Demak, kamida 4 bo‘lak sariyog‘ kerak.

6. 1 m² polni bo‘yash uchun 200 g bo‘yoq ishlatiladi. Bo‘yoq 2 kg li bankalarda sotiladi. Yuzi 64 m² bo‘lgan polni bo‘yash uchun necha banka bo‘yoq sotib olish kerak? Bir banka bo‘yoq narxi 80 000 so‘m bo‘lsa, bo‘yoq sotib olish uchun qancha mablag‘ kerak?

Yechish:

1-usul (*proporsiya tuzish*): 200 g = 0,2 kg ekanini aniqlaymiz.

1 m² ⟶ 0,2 kg

64 m² ⟶ x kg

$x = (64 \times 0{,}2) \div 1 = 12{,}8$ kg bo‘yoq kerak bo‘ladi. Har bir bankada 2 kg bo‘yoq bo‘lsa, 7 banka bo‘yoq olish kerak bo‘ladi.

Har bir banka bo‘yoq narxi 80 000 so‘m bo‘lsa, 7 banka bo‘yoq narxi 80 000 × 7 = 560 000 so‘m bo‘ladi.

2-usulda o‘quvchilar masalani mustaqil yechishlarini ayting.

7. Do‘konda reklama tadbiri o‘tkazilmoqda: sotib olingan har ikki dona qadoqlangan choyga uchinchisi sovg‘a qilinadi (quyidagi rasm). Qadoqlangan choyning narxi 11 500 so‘m. 100 000 so‘mga ko‘pi bilan necha dona qadoqlangan choy sotib olish mumkin?



11 500 so‘m

Yechish:

100 000 ÷ 11 500 = 8 ta (8 000 so‘m ortib qoladi). 8 ta choyning har ikkitasiga 1 ta quti choy sovg‘a qilinsa, 4 juft choyga 4 ta sovg‘a beriladi. Demak, 12 ta quti choy olish mumkin.

Javob: ko‘pi bilan 12 quti choy sotib olish mumkin.

8. Uyni ta’mirlash uchun 42 o‘ram gulqog‘oz sotib olindi. Bir quti yelim 8 o‘ram gulqog‘oz uchun yetadi. Gulqog‘ozlarni devorga yopishtirish uchun necha quti yelim sotib olish kerak? Bir o‘ram gulqog‘oz narxi 70 000 so‘m, bir quti yelim narxi 10 000 so‘m bo‘lsa, uyni ta’mirlash uchun qancha mablag‘ kerak?

Yechish:

42 ÷ 8 = 5,25 ⟶ 6 quti yelim ishlatiladi.

42 × 70 000 = 2 940 000 ⟶ 42 o‘ram gulqog‘oz narxi.

6 × 10 000 = 60 000 ⟶ 6 quti yelim narxi.

Jami uyni 2 940 000 + 60 000 = 3 000 000 so‘m mablag‘ kerak bo‘ladi.

9. Komiljon ota nabiralari uchun bozordan 4 savat qulupnay sotib oldi. Har bir savatda 1,5 kg dan qulupnay bor. Mevalar uchun 120 000 so‘m to‘landi. Bir kilogramm qulupnay narxi qancha?

Yechish:

Jami 4 × 1,5 = 6 kg qulupnay sotib olingan.

6 kg qulpunayga 120 000 so‘m to‘langan.

1 kg qulupnay narxi 120 000 ÷ 6 = 20 000 so‘m bo‘ladi.

10. 1 kilogrammi 12 500 so‘m bo‘lgan konfetdan bir nechta quti xarid qilindi. Har bir qutiga 3 kg dan konfet joylangan. Xarid uchun 300 000 so‘m to‘langan bo‘lsa, necha quti konfet sotib olingan?

Yechish:

1 qutida 3 kg dan bo‘lsa, 1 quti konfet narxi 3 × 12 500 = 37 500 so‘m.

300 000 so‘mga 300 000 ÷ 37 500 = 8 quti konfet sotib sotib olingan.

11. Sevara va uning oilasi har kuni nonushtada to‘rt stakan choy ichadi va bir stakan choyga ikkita oqqand qo‘shadi. Shunga ko‘ra, Sevaraning to‘rt kishilik oilasi 360 dona oqqandni necha kunda tugatadi?

Yechish:

4 ta stakanga 2 donadan oqqand solsa, 8 dona oqqand ishlatiladi. Demak, 1 kunda 8 ta oqqand kerak bo‘ladi.

360 dona oqqand 360 ÷ 8 = 40 kunda tugaydi.

12. Sayohat uchun ma’lum miqdorda pul yig‘ish kerak. Agar har bir sayohatchi 550 so‘mdan to‘lasa, to‘lovga 3 200 so‘m yetmaydi, agar har bir sayohatchi 900 so‘mdan to‘lasa, 5 200 so‘m ortib qoladi. Sayohatga necha kishi chiqishi kerak?

Yechish:

1) Har bir sayohatchi to‘lashi kerak bo‘lgan to‘lovni topamiz: 900 – 550 = 350 so‘m.

2) 3 200 + 5 200 = 8 400.

3) 8 400 ÷ 350 = 24 kishi sayohatga chiqishi kerak.

24 kishidan 550 so‘mdan yig‘ilsa, 13 200 so‘m, 900 so‘mdan yig‘ilsa, 21 600 so‘m bo‘ladi.

4) 13 200 + 3 200 = 16 400 21 600 – 5 200 = 16 400. Demak, yig‘ilishi kerak bo‘lgan pul 16 400 so‘m. Sayohatga 24 nafar sayohatchi chiqishi kerak.

13. Korxona bankdan 40 million so‘mni bir yil muddatga yillik 20% stavkasi bilan olgan bo‘lsa, bir yildan so‘ng korxona jami qancha miqdorda bankka pul qaytaradi?

Yechish:

40 mln so‘mni 20% ini topamiz. Bu 8 mln ga teng.

Bankka qaytariladigan summa 40 mln + 8 mln = 48 mln.

14. 3,1 m² shiftni bo‘yash uchun 150 g bo‘yoq ishlatiladi. Bo‘yoq 3 kg li bankalarda sotiladi. Yuzi 78 m² bo‘lgan shiftni bo‘yash uchun necha banka bo‘yoq sotib olish kerak? Bir banka bo‘yoq narxi 130 000 so‘m bo‘lsa, bo‘yoq ishlari uchun qancha mablag‘ kerak?

Ko‘rsatma: *6-masala yechimidan foydalaning.*

15. Ali bilan Said do‘konga shokolad olgani kirdi. Shokolad olish uchun Aliga 24 so‘m, Saidga esa 2 so‘m yetmayapti. Shokoladning narxi butun sondan iborat. Ali shokoladdan voz kechib, bor pulini Saidga bergan bo‘lishiga qaramay, Saidning puli yetmayapti. Shokoladning narxini toping.

Yechish:

Bolalarning yetmayotgan pulidan shokolad narxi 26 so‘mdan kam (teng emas) ekanini xulosa qilishimiz mumkin. Chunki Ali o‘zida pulni Saidga berganda shokoladga Saidning puli yetgan bo‘lar edi. Narx butun son ekanini hisobga olsak, shokolad narxi 25 so‘mga tengligi kelib chiqadi.

25 so‘mga Alidagi pul 24 so‘m yetmagan bo‘lsa, unda 1 so‘m bor.

25 so‘mga Saidda 2 so‘m yetmagan bo‘lsa, unda 23 so‘m bor.

Demak, Alida 1 so‘m, Saidda 23 so‘m pul bor.

16. Narxi 35 000 so‘m bo‘lgan shirinliklar uchun 140 000 so‘m to‘landi. Necha kilogramm shirinlikka pul to‘langan?

Yechish:

140 000 ÷ 35 000 = 4 kg. **Javob:** 4 kg shirinlikka pul to‘langan.

17. 70 kg o‘rik uchun jami 28 000 so‘m to‘landi. 1 kg o‘rik narxini toping.

Yechish:

28 000 ÷ 70 = 400 so‘m. **Javob:** 1 kg o‘rik narxi 400 so‘m.

18. Sayohat uchun ma’lum miqdorda pul yig‘ish kerak. Agar har bir sayohatchi 750 so‘mdan to‘lasa, to‘lovga 1 200 so‘m yetmaydi, har bir sayohatchi 800 so‘mdan to‘lasa, 1 200 so‘m ortib qoladi. Sayohatga necha kishi chiqishi kerak?

Ko‘rsatma: *12-masala yechimidan foydalaning.*

19. Abbos futbol to‘pi sotib olish uchun bir nechta boladan 12 000 so‘mdan pul yig‘moqchi bo‘ldi. Saflariga 2 ta bola kelib qo‘shilganidan so‘ng, to‘p sotib olish uchun har bir bola 10 000 so‘mdan berishi yetarli bo‘ldi. To‘p sotib olish uchun nechta bola 12 000 so‘mdan pul yig‘moqchi bo‘lgan?

Yechish. (teskari proporsional miqdordan foydalanamiz);

x nafar bola ⟶ 12 000 so‘m.

$(x + 2)$ nafar bola ⟶ 10 000 so‘m

$12000x = 10000(x + 2)$ → $x = 10$ nafar bola. **Javob:** 10 nafar bola.

20. Do‘konda reklama tadbiri o‘tkazilmoqda: sotib olingan har ikki dona tish pastasiga uchinchisi sovg‘a qilinadi. Tish pastasining narxi 8500 so‘m. 50 000 so‘mga ko‘pi bilan nechta tish pastasi sotib olish mumkin?

Ko‘rsatma: *7-masala yechimidan foydalaning.*

Bajarilgan ishga doir masalalar

Barcha o‘quvchilar	Bajarilgan ishga doir masalalar haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Bajarilgan ishga doir masalalarni yaxshi tushunadi, ularni misollarga tatbiq eta oladi.
Ba’zi o‘quvchilar	Bajarilgan ishga doir masalalarni yaxshi tushunadi va ularni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Tenglama nima?
2. Bajarilgan ishga doir masalalar deganda qanday masalalarni tushunasiz?
3. Bajarilgan ishga doir masalalarga namunalar ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda bajarilgan ishga doir masalalar tuzishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda hayotdan misollar keltirishi, bajarilgan ishga doir masalalarni tuzish uchun nimalarni amalga oshirish zarurligi to‘g‘risida taqdimotlar qilish kerak, isrofgarchilikning oldini olishga doir savollar, tarqatmalar tayyorlashi, bajarilgan ishga doir masalalarning hayotiy ahamiyatini isbotlab berishi lozim.

➢ *Uyga vazifa*

6-, 7- misollar (212-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Printer 1 minutda 7 betni chop etadi. Printer 2, 3, 5, 8, 10 betni qanchada chop etadi?

Bajarilgan ish hajmi (A), bet	2	3	5	8	10
Vaqt (t), minutda	0,3	0,4	0,7	1,1	1,4

Yechish:
1 minut = 60 sekund. 60 sekundda 7 bet chop etsa, 2 betni taxminan 17 sekundda chop etadi. Barcha natijalar yaxlitlab olinadi.

2. Ishchi 8 soatda 168 dona detalga ishlov berdi. Ishchining mehnat unumdorligini toping.

Berilgan:
$t = 8$ soat
$A = 168$ dona
$N = ?$
Javob: 1 soatda 21 dona.

$N = A \div t = 168 \div 8$
$N = 21$ (dona)



3. 900 betlik matnni Mubina 20 kunda, Maryam esa 30 kunda kompyuterda teradi. Opa-singillar birgalikda ishlasa, bu matnni necha kunda teradi?

Yechish: Agar Mubina va Mayram butun ishni birgalikda bajarsa, x kunda tugatadi, desak, u holda ushbu qoida o‘rinli bo‘ladi: $\frac{1}{x}=\frac{1}{20}+\frac{1}{30}$. Bu tenglamani yechib, $x = 12$ ekanini topamiz.

Javob: Mubina va Mayram butun ishni birgalikda bajarsa, 12 kunda tugatadi.

4. O‘quvchi 30 minutda matematikadan 2 ta, 3 ta, 5 ta, 6 ta, 10 ta test yechdi. O‘quvchining mehnat unumdorligini toping. Jadvalni to‘ldiring.

Jami yechilgan testlar soni (A), dona	2	3	5	6	10
Mehnat unumdorligi (N)	15	10	6	5	3

5. Talaba 48 betlik loyiha ishini yozishi kerak. U kuniga 2, 3, 4, 6, 8, 12 betdan yozsa, loyiha ishini necha kunda yakunlaydi? Jadvalni to‘ldiring.

Mehnat unumdorligi (N), dona	2	3	4	6	8	12
Vaqt (t), kun	24	16	12	8	6	4

Ko‘rsatma: *1-masalaning yechilishidan foydalaning.*

6. Ishchi a) 2; b) 4; c) 8 soatda 64 dona detalga ishlov berdi. Ishchining mehnat unumdorligini toping.

Yechish: a) 2 soatda 64 dona detalga ishlov bersa, 1 soatda 32 dona detalga ishlov beradi;
b) 1 soatda 16 dona;
c) 1 soatda 8 dona detalga ishlov beradi.

7. Traktorchi 4 soatda 12 ha yerni haydadi. U shunday mehnat unumdorligi bilan ishlasa, 6 soatda qancha yerni haydaydi?

Yechish:

1-usul: proporsiya tuzamiz va to‘g‘ri proporsional miqdordan foydalanamiz. Buning sababini o‘quvchiga tushuntiring.

2-usul: mehnat unumdorligini topamiz: 12 ha ÷ 4 soat = 3 ha. 6 soatda esa 18 ha yerni haydaydi.

Summativ baholash. 8-nazorat ishi

1-variant

1. $3\frac{7}{9}\cdot(6n+7:m)$ ifodaning qiymatini toping, bunda $n = 2{,}4$; $m = 3{,}5$.

2. e va f qanday natural sonlar bo‘lganda $(e+f)(e-f) = 11$ tenglik to‘g‘ri bo‘ladi?

3. Alining kundaligidagi 5 va 4 baholari soni teng. Ularning yig‘indisini hisoblagan edi 15 ning 15 ga ko‘paytmasiga teng chiqdi. Alining 5 va 4 baholari soni nechtadan?

4. 1 kg nok 1 kg olmadan 2 000 so‘m qimmat. 5 kg olma va 4 kg nok uchun 71 000 so‘m to‘landi. 1 kg nok va 1 kg olmaning narxini toping.

5. Usta 1 minutda 12 ta lampochkaning yaroqliligini tekshiradi. Agar u shunday mehnat unumdorligi bilan bir kunda 8 soat mehnat qilsa, u kun davomida nechta lampochkaning yaroqliligini teshira oladi?

2-variant

1. $5\frac{3}{7}(3:m+n)$ ifodaning qiymatini toping, bunda $n = 4{,}8$; $m = -0{,}4$

2. p va f qanday natural sonlar bo‘lganda $(p+q)(p-q) = 7$ tenglik to‘g‘ri bo‘ladi?

3. Ozodaning kundaligidagi 5, 4 va 3 baholari soni teng. Ularning yig‘indisini hisoblagan edi 8 ning 18 ga ko‘paytmasiga teng chiqdi. Alining 5, 4 va 3 baholari soni nechtadan?

4. 1 kg banan 1 kg apelsindan 3 000 so‘m qimmat. 2 kg banan va 4 kg apelsin uchun 78 000 so‘m to‘landi. 1 kg banan va 1 kg apelsinning narxini toping.

5. Quruvchi 1 minutda 15 ta g‘isht teradi. Agar u shunday mehnat unumdorligi bilan bir kunda 8 soat mehnat qilsa, kun davomida nechta g‘isht tera oladi?

IX BOB. MA’LUMOTLAR BILAN ISHLASH

Jadvallar. Jadvallarni o‘qish va tuzish

Barcha o‘quvchilar	Jadvallarni o‘qish va tuzish haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	Jadvallarni o‘qish va tuzishga oid misollarni yaxshi tushunadi.
Ba’zi o‘quvchilar	Jadvallarni o‘qish va tuzishni yaxshi tushunadi, ularni murakkab masalalarga va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Jadval nima?
2. Jadvallarni o‘qish va tuzish deganda nimani tushunasiz?
3. Narsalarning sanog‘i qanday hisoblanadi?

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda jadvallarni o‘qish va tuzishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda hayotdan misollar keltirishi, jadvallarni o‘qish va tuzishda nimalarga e’tibor berish zarurligi to‘g‘risida taqdimotlar qilishi, xatolarning oldini olishga doir savollar, tarqatmalar tayyorlashi, jadvallarni o‘qish va tuzishning hayotiy ahamiyatini isbotlab berishi lozim.

Darslikda mavzuga doir misollar kam berilgani (chunki hamma ham masala yecha olmaydi) uchun past va o‘rta o‘zlashtiruvchi o‘quvchilarga bir nechta misollar tuzib, uyga vazifa tarzida berishingiz mumkin.

➢ *Uyga vazifa*

5-misol (216-bet)

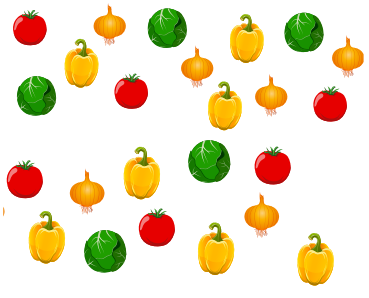
➢ *Mashqlar, ularning javoblari va yechimlari*

1. Sinfdoshlaringiz yoqtirgan shirinlik turlarini ko‘rsatish uchun jadval tuzing. Raqamlar o‘rniga sanoq belgilaridan foydalaning. Jadvalni berilgan savollar orqali o‘qing.

- ❖ “Shokolad” yonida 4 ta sanoq belgisi bor, demak 4 ta do‘stingiz bu turdagi shirinlikni yoqtiradi.
- ❖ “Konfet” yonida 2 ta belgi bor, demak, 2 nafar do‘stingizga bu turdagi shirinlik yoqadi.
- ❖ “Marmelad” yonida 3 ta sanoq belgisi bor, demak, 3 nafar do‘stingizga bu turdagi shirinlik yoqadi.
- ❖ “Birortasi ham” yonida 1 ta sanoq belgisi bor, demak, 1 nafar do‘stingiz ro‘yxatdagi shirinliklarning hech birini yoqtirmaydi.
- ❖ “Muzqaymoq” (eng sevimli shirinlik) yonidagi hisob belgilariga nazar tashlasangiz, ularning biroz boshqacha ko‘rinishini payqaysiz. Sanoq belgilari 5 tadan ko‘p. Beshinchi sanoq belgisidan keyin siz yangi 5 talik guruhni boshlashingiz kerak.

Shirinliklar	Sanog‘i	Soni
Muzqaymoq	𝍸	6
Shokolad	𝍷	4
Konfet	𝍵	2
Marmelad	𝍶	3
Birortasi ham	𝍵	1

2. Berilgan sabzavotlar uchun jadval tuzing va savollarga javob bering.



Sabzavot	Sanog‘i	Soni
Karam	𝍸	5
Pomidor	𝍸𝍵	6
Bulg‘or qalampiri	𝍸𝍶	7
Piyoz	𝍸𝍵	6

Qaysi sabzavot eng ko‘pi?
Javob: bulg‘or qalampiri – 7 ta.
Eng kami-chi?
Javob: karam – 5 ta.
Jami qancha sabzavot bor?
Javob: 24 ta.

3. Olimjon sinfdoshlari o‘rtasida yoqtirgan fanlari haqida so‘rovnoma o‘tkazdi. Natijada quyidagi jadval hosil bo‘ldi (bir necha fan tanlanishi mumkin).

Fan	Sanog‘i
Matematika	𝍸 𝍸
Ingliz tili	𝍸 𝍸 𝍸 //
Ona tili	///
Tabiiy fanlar	𝍸 𝍸 𝍸 𝍸 ///
Tarix	𝍸 𝍸 𝍸 /

Nechta o‘quvchi ingliz tili fanini tanladi?
Javob: 17 nafar.
Nechta o‘quvchi matematika yoki tabiiy fanlarni tanladi?
Javob: matematikani 10 nafar, tabiiy fanlarni 23 nafar.
Qaysi fan eng ko‘p tanlandi?
Javob: tabiiy fan, 23 nafar.
Sinfda shunday so‘rovnoma o‘tkazing.

4. Jadvalda mahalladagi go‘zallik saloniga mijozlar tashrifi haqida ma’lumot keltirilgan.

Kun	Mijozlar
Dushanba	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 ///
Seshanba	𝍸 𝍸 𝍸 𝍸 𝍸 /
Chorshanba	𝍸 𝍸 ///
Payshanba	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸
Juma	𝍸 𝍸 𝍸 𝍸 𝍸 ////
Shanba	𝍸 𝍸 𝍸 /
Yakshanba	𝍸 𝍸 𝍸 𝍸 /

1) Seshanba kuni qancha mijoz keldi?
Javob: 31 nafar.
2) Qaysi kuni ko‘proq mijoz keldi?
Javob: payshanba kuni, 45 nafar.
3) 24 dan ortiq mijoz necha kunda keldi?
Javob: dushanba, seshanba, payshanba, juma kunlari 24 nafardan ortiq mijoz kelgan.
4) Qaysi kuni eng kam mijoz keldi?

Javob: chorshanba kuni, 13 nafar

5) 32 ta mijoz necha kunda keldi?

Javob: dushanba va payshanba kunlari.

6) Dushanba kuni qaysi kunlardagidan kamroq mijoz kelgan?

Javob: payshanba.

5. Sinflararo futbol musobaqasi jadvalini o‘rganing va savollarga javob bering.

Sinf	1	2	3	4	5	G‘alaba	Durang	Mag‘lubiyat	Ochko	O‘rin
6-A		2:3	1:2	0:0	2:1	1	1	2	4	4
6-B	3:2		5:0	0:1	4:2	3	-	1	9	1
6-D	2:1	0:5		1:1	2:0	2	1	1	7	2
6-E	0:0	1:0	1:1		2:2	1	3	-	6	3
6-F	1:2	2:4	0:2	2:2		-	1	3	1	5

1) Qaysi jamoa eng ko‘p g‘alaba qozongan? – 6-“B” sinf, 3 marta g‘alaba qozongan.

2) Qaysi jamoa eng kam g‘alaba qozongan? – 6-“A” sinf va 6-“E” sinf 1 martadan g‘alaba qozongan.

3) Qaysi jamoa eng ko‘p durang natija qayd etgan? – 6-“E” sinf 3 marta durang natija qayd etgan.

4) Qaysi jamoa eng kam durang natija qayd etgan? – 6-“A”, 6-“D”, 6-“F” sinflar 1 martadan durang natija qayd etgan.

5) Qaysi jamoa eng ko‘p gol urgan? Eng kami-chi? – Birinchi, ikkinchi, uchinchi o‘yinda 6-“B” sinf jamoasi ko‘p gol urgan, eng kam gol urgan sinflar – 6-“A” sinf uchinchi o‘yinda 1 marta gol urgan, 6-“E” sinf ikkinchi va uchinchi o‘yinda 1 martadan gol urgan, 6-“F” sinf ham birinchi o‘yinda 1 marta gol urgan.

6) Qaysi jamoa bitta o‘yinda eng ko‘p gol urgan? – 6-“B” sinf jamoasi uchinchi o‘yinda 5 marta gol urgan.

7) Qaysi natija eng ko‘p uchragan? – Yutuq.

8) Eng kam gol kiritgan jamoa musobaqada g‘olib bo‘lishi mumkinmi? – Yo‘q.

9) Eng kam g‘alaba qozongan jamoa musobaqada g‘olib bo‘lishi mumkinmi? – Yo‘q.

Ma’lumotlar qatori

Barcha o‘quvchilar	Ma’lumotlar qatorini tahlil qila oladi.
Aksariyat o‘quvchilar	O‘rta arifmetik, o‘zgarishlar kengligi, mediana, moda haqida tushunchaga ega bo‘ladi, ma’lumotlarni tahlil qilishga oid misollarni yechadi, ularni misollarga tatbiq eta oladi.
Ba’zi o‘quvchilar	Ma’lumotlarni tahlil qilishga oid murakkab misollarni yechadi, ularni misollarga tatbiq eta oladi.

➢ *Faollashtiruvchi savollar*

1. Ma’lumotlar qatori nima?

2. Oilangiz haqida ma’lumot tuzing. Undan, masalan, oilangizdagilarning yoshi, bo‘yi, salomatligi, ularning kasblari, orzulari, kiyimlarining, oyoq kiyimlarining o‘lchami va hokazolar o‘rin olsin.

3. Jadvallarni tuzishga misollar ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda ma’lumotlar qatorini tuzishda qiynalishadi. Bu holatning oldini olish uchun, o‘qituvchi mavzuni tushuntirayotganda hayotdan misollar keltirishi, ma’lumotlar qatorini tuzish uchun nimalar kerakligi to‘g‘risida taqdimotlar qilishi lozim, xatolarning oldini olishga doir savollar, tarqatmalar tayyorlashi, ma’lumotlar qatorining hayotiy ahamiyatini isbotlab berishi kerak.

Darslikda mavzuga doir misollar kam berilgani (chunki hamma ham masala yecha olmaydi) uchun o‘zingiz past va o‘rta o‘zlashtiruvchi o‘quvchilarga bir nechta misollar tuzib, uyga vazifa sifatida berishingiz mumkin.

➢ *Uyga vazifa*

1–2-amaliy ish (218-bet).

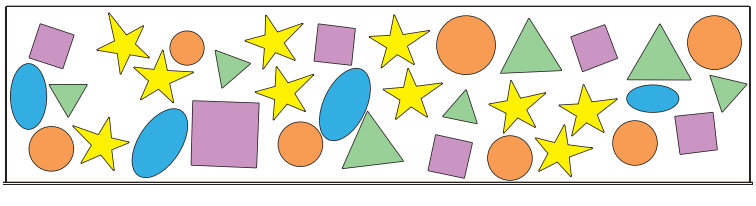
➢ *Mashqlar, ularning javoblari va yechimlari*

1. Berilgan ma’lumotlarni jadval va grafik shaklida tasvirlang.

1) Jami nechta shakl bor?

2) Qaysi shakl ko‘proq uchraydi?

3) Qaysi shakllar ko‘proq: uchburchaklarmi yoki kvadratlarmi?



Shakllar	Kvadrat	Aylana	Uchburchak	Yulduzcha	Yoyiq aylana
Soni	6	7	7	10	4

1) Jami shakllar soni 34 ta.

2) Beshburchak.

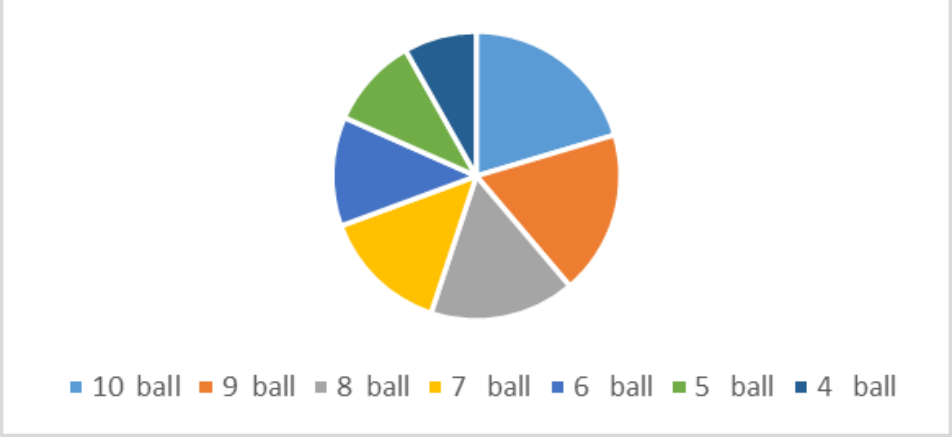
3) Beshburchak, uchburchak, aylana shakllari ko‘proq uchraydi.

2. O‘qituvchi o‘z sinfiga matematikadan 10 ta savolli test berdi. Quyidagi natijalar qayd etildi: 9, 7, 8, 6, 4, 7, 10, 9, 8, 7, 6, 7, 5, 5, 10, 9, 8, 8, 7, 9, 10, 5, 7, 6, 8, 8, 7, 9, 6, 9.

1) Eng yuqori natija necha ball?
2) Eng past natija necha ball?
3) Ma’lumotlar uchun jadval, gistogramma tuzing.
4) Eng ko‘p uchraydigan natija necha ball?
5) Nechta o‘quvchi 7 tadan kam to‘g‘ri javob berdi?
6) Nechta o‘quvchi atigi 2 yoki undan kam xatoga yo‘l qo‘ygan?

Javoblar:

1) Eng yuqori natija 10 ball.
2) Eng past natija 4 ball.
3)



4) Eng ko‘p uchraydigan natija 7 ball.

5) 8 ta o‘quvchi 7 tadan kam savolga to‘g‘ri javob bergan.

6) 20 ta o‘quvchi.

➢ *1-amaliy ish*

O‘yin kubigi 33 marta tashlanganda quyidagi natijalar qayd etildi:

4, 2, 3, 1, 3, 4, 6, 1, 5, 3, 4, 6, 6, 3, 4, 2, 1, 1, 4, 5, 6, 3, 4, 5, 1, 3, 5, 4, 2, 6, 1, 2, 5.

1) Ma’lumotlarni jadvalga yozing.

2) Qaysi natija eng katta songa ega?

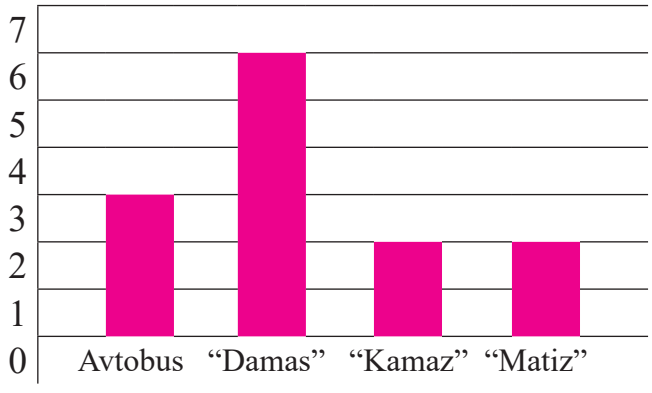
3) Qaysi natija eng kichik songa ega?

4) Agar siz bu kubikni yana 33 marta tashlasangiz, xuddi shunday natijaga erishasizmi? Tekshirib ko‘ring.

➢ *2-amaliy ish*

Ertalab maktab darvozasi yonidan o‘tadigan avtotransport vositalari to‘g‘risida ma’lumotlarni to‘plang hamda uni jadval yoki diagramma shaklida tasvirlang.

Javoblar: 3 ta avtobus, 6 ta “Damas”, 2 ta “Kamaz”, 2 ta “Matiz”.



➢ *4-amaliy ish*

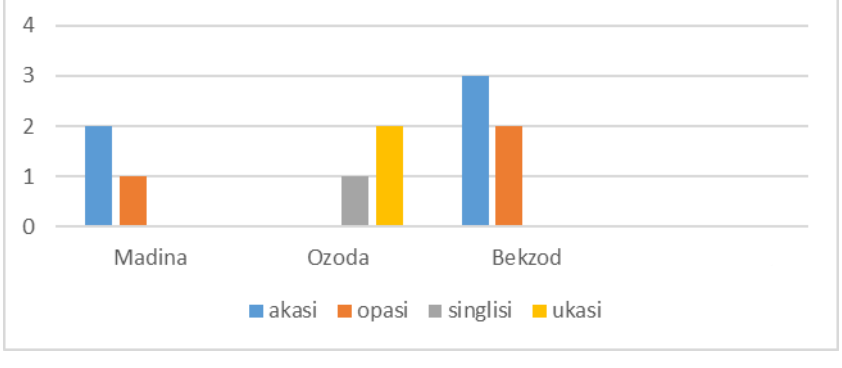
Har bir sinfdoshingizning oilasidagi bolalar soni bo‘yicha to‘plangan ma’lumotlarni jadvalga yozing. Shuningdek, ushbu ma’lumotni ko‘rsatadigan diagrammani tuzing.

Javoblar: *bu yerda ma’lumotlar taxminiy olingan.*

Madinaning 2 ta akasi va 1 ta opasi bor.

Ozodaning 1 ta singlisi va 2 ta ukasi bor.

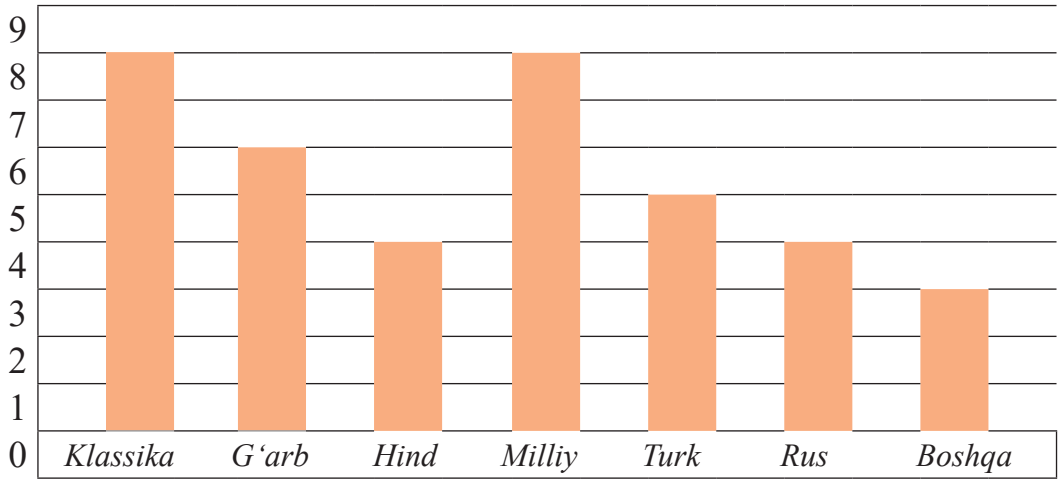
Bekzodning 3 ta akasi va 2 ta opasi bor.



➢ *5-amaliy ish*

Sinfdoshlaringiz orasida musiqaning qaysi turi ko‘proq eshitilishini bilish uchun so‘rovnoma o‘tkazing. Quyidagi jadvalni tuzib, mos diagramma yasang.

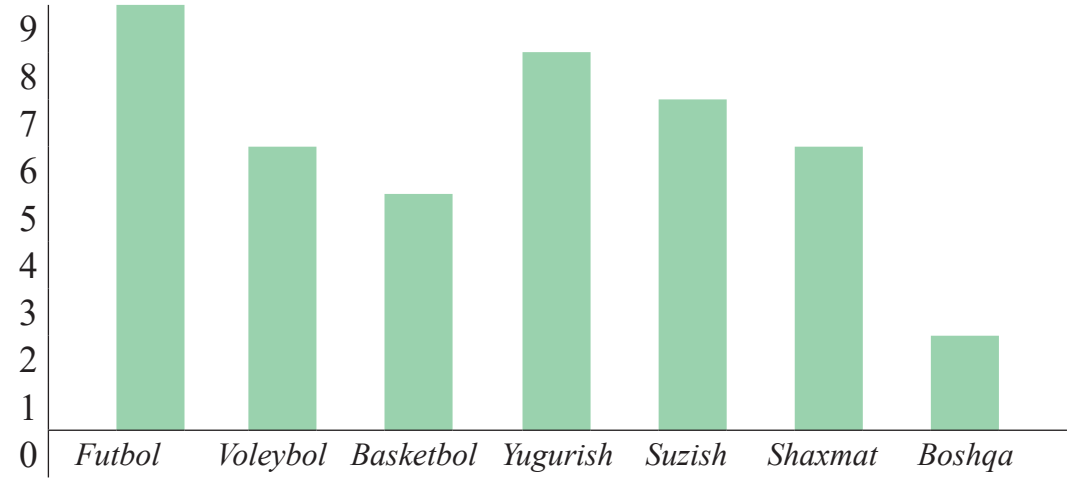
Tur	Sanog‘i	Soni
Klassik	𝍸 III	8
G‘arb	𝍸 I	6
Hind	IIII	4
Milliy estrada	𝍸 III	8
Turk estradasi	𝍸	5
Rus estradasi	IIII	4
Boshqa	III	3



➢ *6-amaliy ish*

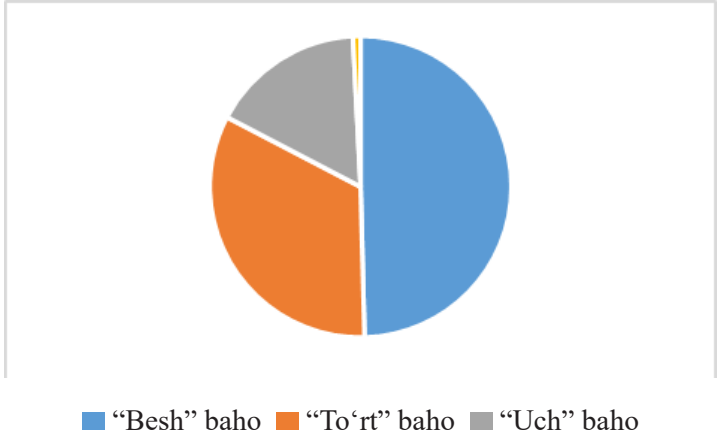
Sinfdoshlaringiz sportning qaysi turiga ko‘proq qiziqishini bilish uchun so‘rovnoma o‘tkazing. Quyidagi jadvalni tuzib, mos diagramma yasang.

Tur	Sanog‘i	Soni
Futbol	𝍸 𝍸 ||||	9
Voleybol	𝍸 𝍸 |	6
Basketbol	𝍸 𝍸	5
Yugurish	𝍸 𝍸 |||	8
Suzish	𝍸 𝍸 ||	7
Shaxmat	𝍸 𝍸 |	6
Boshqa	||	2



➢ *1-amaliy ish*

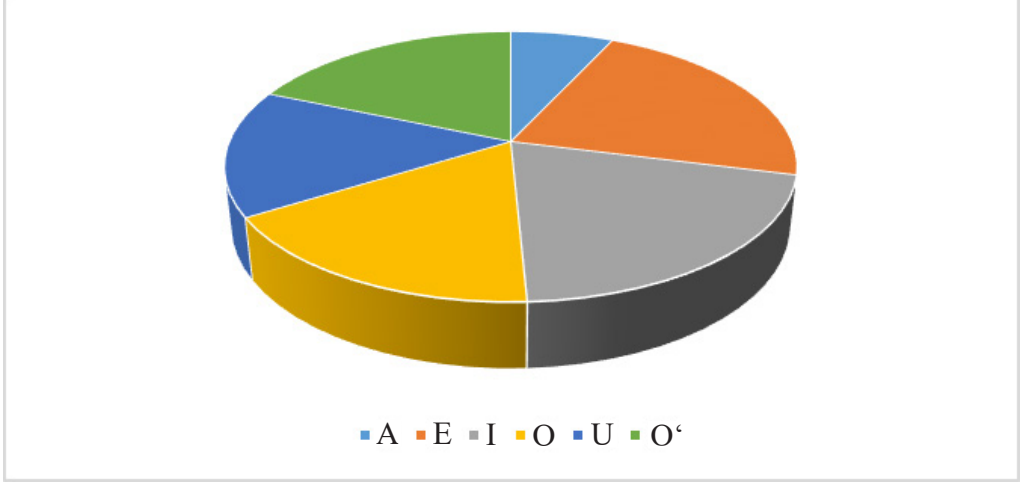
Kundaligingizdan foydalanib oxirgi oyda qancha va qanday baholar olganingizni o‘rganib chiqing. Natijalarni gistogramma ko‘rinishida ifodalang.



➢ *2-amaliy ish*

“Adabiyot” darsligidan yoqtirgan she’ringizni tanlab oling va undagi unli harflar sonini sanab chiqing. Mos jadval va gistogramma tuzing. Qaysi harf ko‘proq uchraydi? Natijangizni boshqa sinfdoshlaringizniki bilan solishtiring.

Unli harflar	A	E	I	O	U	O‘
Soni	32	26	24	20	18	22



Ma’lumotlar tahlili

Barcha o‘quvchilar	Ma’lumotlar tahlili, moda haqida tushunchaga ega bo‘ladi.
Aksariyat o‘quvchilar	O‘rta arifmetik, o‘zgarishlar kengligi, mediana, moda haqida tushunchaga ega, ma’lumotlar tahliliga oid misollarni yaxshi tushunadi, ularni misollarga tatbiq eta oladi.
Ba’zi o‘quvchilar	O‘rta arifmetik, o‘zgarishlar kengligi, mediana, moda, haqida tushunchaga ega, ma’lumotlar tahlilini yaxshi tushunadi, ularni murakkab masalalarga va jadvallarni hisoblashga tatbiq etadi.

➢ *Faollashtiruvchi savollar*

1. Ma’lumotlar tahlili nima?
2. Oilangiz haqida ma’lumot tuzing (masalan, oilangizdagilarning yoshi, bo‘yi, salomatligi, ularning kasblari, orzulari, kiyimlarining, oyoq kiyimlarining o‘lchami kabi) va ularni tahlil qiling.
3. O‘rta arifmetik, o‘zgarishlar kengligi, mediana, modaga misollar ayting.

➢ *Yo‘l qo‘yilishi mumkin bo‘lgan xatolar va ularni bartaraf qilish uchun tavsiya*

O‘quvchilar odatda ma’lumotlar tahlilini tuzishda o‘rta arifmetik, o‘zgarishlar kengligi, mediana, modalarni topishda, ularni ajratishda qiynalishadi. Bu holatning oldini olish uchun o‘qituvchi mavzuni tushuntirayotganda hayotdan misollar keltirishi, ma’lumotlar tahlili uchun nimalar qilish zarurligi to‘g‘risida taqdimotlar qilishi kerak, xatolarning oldini olishga doir savollar, tarqatmalar tayyorlashi, ma’lumotlar tahlilining hayotiy ahamiyatini isbotlab berishi lozim.

➢ *Uyga vazifa*

1-2-amaliy ish. (218-bet)

➢ *Mashqlar, ularning javoblari va yechimlari*

1. Jadvalda bir hafta davomida har kuni muzeyga keladigan odamlar soni ko‘rsatilgan. Ma’lumotlar qatoridan o‘zgarish kengligini toping.

– Eng ko‘p tashrif qaysi kuni bo‘lgan?
– Eng kam tashrif qaysi kuni bo‘lgan?
– Shu kuni necha nafar odam muzeyga tashrif buyurgan? Eng kam kuni-chi?
– O‘zgarish kengligi nechaga teng?

Yechish:

Eng ko‘p tashrif juma kuni bo‘lgan.

Eng kam tashrif seshanba kuni bo‘lgan.

Juma kuni muzeyga 90 nafar, seshanba kuni 15 nafar odam tashrif buyurgan.

O‘zgarish kengligi: 90 – 15 = 75

Kunlar	Odamlar soni
Seshanba	15
Chorshanba	35
Payshanba	83
Juma	90
Shanba	42
Yakshanba	51

2. Shaxmat musobaqasida 6-sinfning 8 nafar o‘quvchisi 13; 13; 12; 13; 10; 13; 12; 10 ochko to‘pladi. Ular olgan ochkolarning o‘rta arifmetik qiymatini toping.

Yechish: $\frac{13+13+12+13+10+13+12+10}{8}=\frac{96}{8}=12$

3. Jadvalda bir haftalik ob-havo ma’lumoti berilgan. Uning medianasini toping.

Yechish: 15; 17; 13; 14; 18; 19 → 13; 14; 15; 17; 18; 19 → $\frac{15+17}{2}=16$

Kunlar	Harorat
Seshanba	+15 °C
Chorshanba	+17 °C
Payshanba	+13 °C
Juma	+14 °C
Shanba	+18 °C
Yakshanba	+19 °C

4. Jadvalda barcha 6-sinf o‘quvchilarining choraklik baholari to‘g‘risida ma’lumotlar berilgan. Uning modasini toping.

Baholar	Soni
“5”	48
“4”	34
“3”	48
“2”	8

Yechish:

Soni → 48; 34; 48; 8 → moda 48

5. Ushbu qator uchun o‘zgarish kengligi, o‘rta arifmetik, mediana va modani aniqlang: 6; 9; 7; 3; 9; 4; 7; 6; 5.

1) o‘zgarish kengligi: 9 – 3 = 6

2) mediana: 3; 4; 5; 6; 6; 7; 7; 9; 9 → 6

3) o‘rta arifmetik: $\frac{3+4+5+6+6+7+7+9+9}{9}=\frac{56}{9}=8.$

4) moda: 3; 4; 5; 6; 6; 7; 7; 9; 9→ bu yerda moda 6, 7, 9.

6. Ushbu qatorlarning o‘zgarish kengligi, o‘rta arifmetik qiymati, mediana va modasini aniqlang.

a) 2, 5, 3, 4, 5

b) 7, 9, 6, 9, 8, 7, 7

c) 10, 20, 10, 50, 40, 30

d) 17, 20, 19, 22, 21, 17, 20

e) 49, 50, 48, 51, 50

f) 8, 10, 12, 7, 8, 10, 9, 8, 10, 8, 11

g) 5, 4, 6, 3, 2, 4, 6, 9, 4, 7, 3, 2

h) 147, 151, 148, 150, 148, 152, 151

Yechish:

a) o‘rta arifmetik: $\frac{2+3+4+5+5}{5}=\frac{19}{5}=3,8$ mediana: 2, 3, 4, 5, 5 → 5

b) o‘rta arifmetik: $\frac{6+7+7+7+8+9+9}{7}=\frac{53}{7}$ mediana: 6, 7, 7, 7, 8, 9, 9→ 7

c) o‘rta arifmetik: $\frac{10+10+20+30+40+50}{6}=\frac{160}{6}$ mediana: 10, 10, 20, 30, 40, 50 → 25

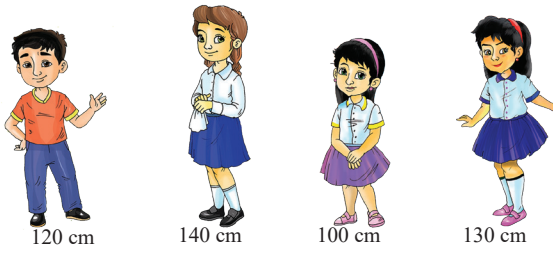
7. Bolalarning bo‘yi uzunligining o‘zgarish kengligi, o‘rta arifmetik qiymati, mediana va modasini aniqlang.

1) $\frac{100+120+130+140}{4}=\frac{490}{4}$

2) 100, 120, 130, 140 medianasini topish

$\frac{120+130}{2}=\frac{250}{2}=125$

3) 100, 120, 130, 140 → moda yo‘q



8. Sinf o‘quvchilarining choraklik o‘zlashtirish baholarining modasi, o‘zgarish kengligini aniqlang.

Barcha darslarni “5”ga o‘zlashtirganlar soni – 8

“4” ga o‘zlashtirganlar soni – 14

“3” ga o‘zlashtirganlar soni – 10

Javob: 8, 14, 10 → bu yerda moda yo‘q, o‘zgarish kengligi 8, 14, 10 → 14 – 8 = 6.

9. Sotuvchi bir kunda 37 ta ertak kitobi, 120 ta darslik, 16 ta texnikaga oid kitob, 24 ta rasm daftari, 9 ta geografik atlas sotdi. Xaridorlar uchun qaysi mahsulot moda bo‘ldi?

Javob: moda yo‘q.

10. Davron ovlagan baliqlarining massasini alohida-alohida o‘lchaganida ularning massalari: 1,2 kg; 3,24 kg; 1,9 kg; 2,16 kg; 2 kg ekani aniq bo‘ldi. Davron ovlagan bitta baliqning o‘rtacha massasi necha kilogramm? Baliq massalarining o‘zgarish kengligi necha kilogramm?

Yechish: o‘zgarish kengligi: 3,24 – 1,2 = 2,04.

O‘rtacha massa: (1,2 + 3,24 + 1,9 + 2,16 + 2)÷5 = 10,5 ÷5 = 2,1

11. Yanvar oyining bir sutkasida havoning harorati ertalab +2 °C, tushda +6 °C, tushdan keyin +4 °C , kechqurun +3 °C , tunda 0 °C bo‘ldi.

1) Havoning sutkalik o‘rtacha harorati necha gradus?

2) Sutka davomida havoning o‘zgarish kengligi qanday?

3) O‘sha sutkadagi havo haroratining medianasi necha gradus?

4) O‘sha sutkadagi havo haroratining modasi bormi?

12. Kombaynchi g‘alla o‘rimi paytida: 1-kuni 15,2 ha, 2-kuni 18,6 ha, 3-kuni 16,2 ha, 4-kuni 14,7 ha, 5-kuni 17,3 ha yer maydonida g‘alla o‘rdi. Kombaynchi bir kunlik g‘alla o‘rgan yer maydonining o‘rtacha qiymatini toping. Uning o‘zgarish kengligini hisoblang. Modasi bormi?

Yechish: 1) o‘rta arifmetik qiymat: $\frac{15,2+18,6+16,2+14,7+17,3}{5}=\frac{82}{5}$

2) o‘zgarish kengligi: $18,6-14,7=3,9$

3) 15,2; 18,6; 16,2; 14,7; 17,3 → bu yerda moda qiymat yo‘q.

13. 3-chorakda olgan barcha baholaringizning o‘rta arifmetigini, o‘zgarish kengligi va medianasini toping.

Baholar	Soni
“Besh”	6
“To‘rt”	4
“Uch”	2

Yechish: 1) $\frac{6+4+2}{3}=4$ o‘rta arifmetik qiymati.

2) $6-2=4$ o‘zgarish kenglig qiymati.

3) 2; 4; 6 → 4 mediana qiymati.

14. Fermer 6 ha yerga bug‘doy ekib, uning 1-gektaridan 34 q, 2-gektaridan 36 q, 3-gektaridan 35 q, 4-gektaridan 37 q, 5-gektaridan 34 q, 6-gektaridan 37 q hosil oldi.

Fermer olgan bug‘doyning o‘rtacha hosili necha sentner? Modasi necha sentner? Medianasini toping.

Yechish:

1) $\frac{34+36+35+37+34+37}{6}=\frac{213}{6}$ o‘rtacha arifmetik (hosil) qiymati.

2) 34; 36; 35; 37; 34; 37 → 34; 37 moda qiymati.

3) 34; 34; 35; 36; 37; 37 → (36 + 35) ÷ 2 = 35,5 mediana qiymati.

15. Jismoniy tarbiya darsida o‘quvchilar guruhining 100 m masofaga yugurgan vaqti ko‘rsatkichlari jadvali berilgan.

Jadvalga asosan:

a) vaqtlarining o‘rta arifmetigini;

b) vaqtning o‘zgarish kengligini;

c) o‘quvchilar yugurgan vaqtlarning medianasini toping.

O‘quvchilarning ismlari	Yugurib o‘tgan vaqti (sekund hisobida)
Aziz	14,1
Alisher	18,2
Dilshoda	15,5
Zuhro	16,2
Marjona	22,4
Rustam	16,2

Yechish: a)

$\frac{14,1+18,2+15,5+16,2+22,4+16,2}{6}=\frac{102,6}{6}=17,1$ o‘rta arifmetik qiymati.

b) $22,4-14,1=8,3$ o‘zgarish kengligi qiymati.

c) 14,1, 15,5, 16,2, 16,2, 18,2, 22,4 → (16,6 + 16,6) ÷ 2 = 16,6 mediana qiymati.

16. Farhod usta shogirdlari bilan birgalikda birinchi kuni 1 000 ta, ikkinchi kuni 1 200 ta, uchinchi kuni 1 900 ta, to‘rtinchi kuni 2 200 ta g‘isht terdi. Har bir terilgan g‘isht uchun 250 so‘m pul beriladi. Jamoa jami necha so‘m pul olgan? Terilgan g‘ishtlar sonining o‘rta arifmetik qiymati hisoblansa, pul miqdori qanday o‘zgaradi?

Yechish: 1) $(1000+1200+1900+2200)\times 250=1575000$ so‘m

2) $\left(\frac{1000+1200+1900+2200}{4}\right)\times 250=393750$ 3) $1575000-393750=1181250$ so‘m pul miqdorini o‘zgarishi.

17. O‘yinchoq mashina bosib o‘tadigan masofani rasmdagi kabi turli xil balandliklarda sinang. Barcha masofalarni o‘lchab, o‘rtacha bosib o‘tilgan yo‘lni toping. O‘zgarish kengligi va modasini topa olasizmi?

Yechish: *o‘lchamlar taxminiy olingan. O‘quvchilar aniq o‘lchamni olishi kerak.*



1) $\frac{75+85+100+75+65}{5}=80$ o‘rtacha qiymati.

2) 100 – 65 = 35 o‘zgarish kenglik qiymati.

3) 65; 75; 75; 85; 100 → 75 moda qiymati.

18. Dekabr oyining bir sutkasida havo harorati ertalab, tushda, kechqurun va tunda o‘lchandi. O‘lchash natijalari bo‘yicha o‘sha kundagi havoning sutkalik o‘rta arifmetik qiymati –6 ºC bo‘ldi. Tushdagi havo harorati ertalabki haroratga nisbatan 3 ºC sovuq, kechqurungi harorat 1 ºC va tungi harorat 4 ºC sovuq bo‘ldi. Havo haroratining sutka davomidagi o‘zgarish kengligini, medianasini toping.

Yechish: 1) ertalabki harorat x ºC, tushdagi harorat $(x-3)$ ºC, kechki harorat –1 ºC, tungi harorat –4 ºC.

$(x+(x-3)+(-1)+(-4))=6 \quad \rightarrow \quad x=14$ ºC

a) Ertalabgi harorat → 14 ºC, tushdagi harorat → 13 ºC, kechqurungi harorat → –1 ºC, tungi harorat → – 4 ºC

2) 14 ºC – (–4 ºC) = 18 ºC o‘zgarish kengligi qiymati.

3) –4 ºC, –1 ºC, 13 ºC , 14 ºC → (–1 ºC + 13 ºC) ÷ 2 = 6 ºC mediana qiymati.

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Summativ baholash. 9-nazorat ishi

1-variant

1. O‘quvchiga sinov uchun berilgan 10 balldan baholanadigan 10 ta misolning yechimi o‘qituvchi tomonidan 8, 7, 9, 8, 6, 7, 8, 5, 8, 9 ball bilan baholandi.

a) o‘quvchi jami qancha ball to‘plagan?

b) o‘quvchining nechta yechimiga yuqori ball berilgan;

d) o‘quvchining nechta yechimiga eng kam ball berilgan;

e) o‘quvchining nechta yechimi 8 ball bilan baholandi;

f) o‘quvchining baholarini o‘sib borish tartibida yozing, hosil bo‘lgan ma’lumotlar qatoridan hadlar modasini toping.

2. 6 ta o‘quvchi basketbol topini navbat bilan 20 tadan savatchaga otishdi. Ular quyidagicha natijaga erishdi: Akmal 14 ta, Bobur 18 ta, Ikrom 16 ta, Farrux 12 ta, Abdullox 17 ta, Sharif 13 ta to‘pni basketbol savatchasiga tushirdi.

a) o‘quvchilarning natijalarini o‘sib borish tartibida yozing;

b) eng ko‘p va eng kam natijaga erishgan o‘quvchilarning natijalarini taqqoslang.

d) natijalar qatoridan qatorning medianasini toping.

e) barcha natijalarning o‘rta arifmetigini toping.

2-variant

1. O‘quvchiga sinov uchun berilgan 10 balldan baholanadigan 10 ta misolning yechimi o‘qituvchi tomonidan 5, 7, 9, 7, 6, 7, 8, 6, 8, 9 ball bilan baholandi.

a) o‘quvchi jami qancha ball to‘plagan?

b) o‘quvchining nechta yechimiga yuqori ball berilgan;

d) o‘quvchining nechta yechimiga eng kam ball berilgan;

e) o‘quvchining nechta yechimi 8 ball bilan baholandi;

f) o‘quvchining baholarini o‘sib borish tartibida yozing, hosil bo‘lgan ma’lumotlar qatoridan hadlar modasini toping.

2. 6 ta o‘quvchi berilgan 20 ta testga quyidagicha javob berishdi: Aziza 13 ta, Zilola 17 ta, Iroda 15 ta, Farangiz 11 ta, Nozanin 17 ta, Shahlo 11 ta topdi.

a) o‘quvchilarning natijalarini o‘sib borish tartibida yozing;

b) eng ko‘p va eng kam natijaga erishgan o‘quvchilarning natijalarini taqqoslang.

d) natijalar qatoridan qatorning medianasini toping.

e) barcha natijalarning o‘rta arifmetigini toping.

MATEMATIKA 6

O‘QITUVCHILAR UCHUN METODIK QO‘LLANMA

Muharrir *Orifjon Madvaliyev*
Badiiy muharrir *Sarvar Farmonov*
Dizayner *Alimardon Aqilov*
Texnik muharrir *Akmal Sulaymonov*
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Musahhih *Xurshidbek Ibrohimov*

Bosishga 00.00.2022-yilda ruxsat etildi. Bichimi 60x84 $^{1}/_{8.}$
Times Nev Roman garniturasi. Kegli 12. Ofset bosma.
Shartli bosma tabog‘i 00,00. Nashriyot-hisob tabog‘i 00,00.
Adadi 000 000 nusxa. Buyurtma № 0000.