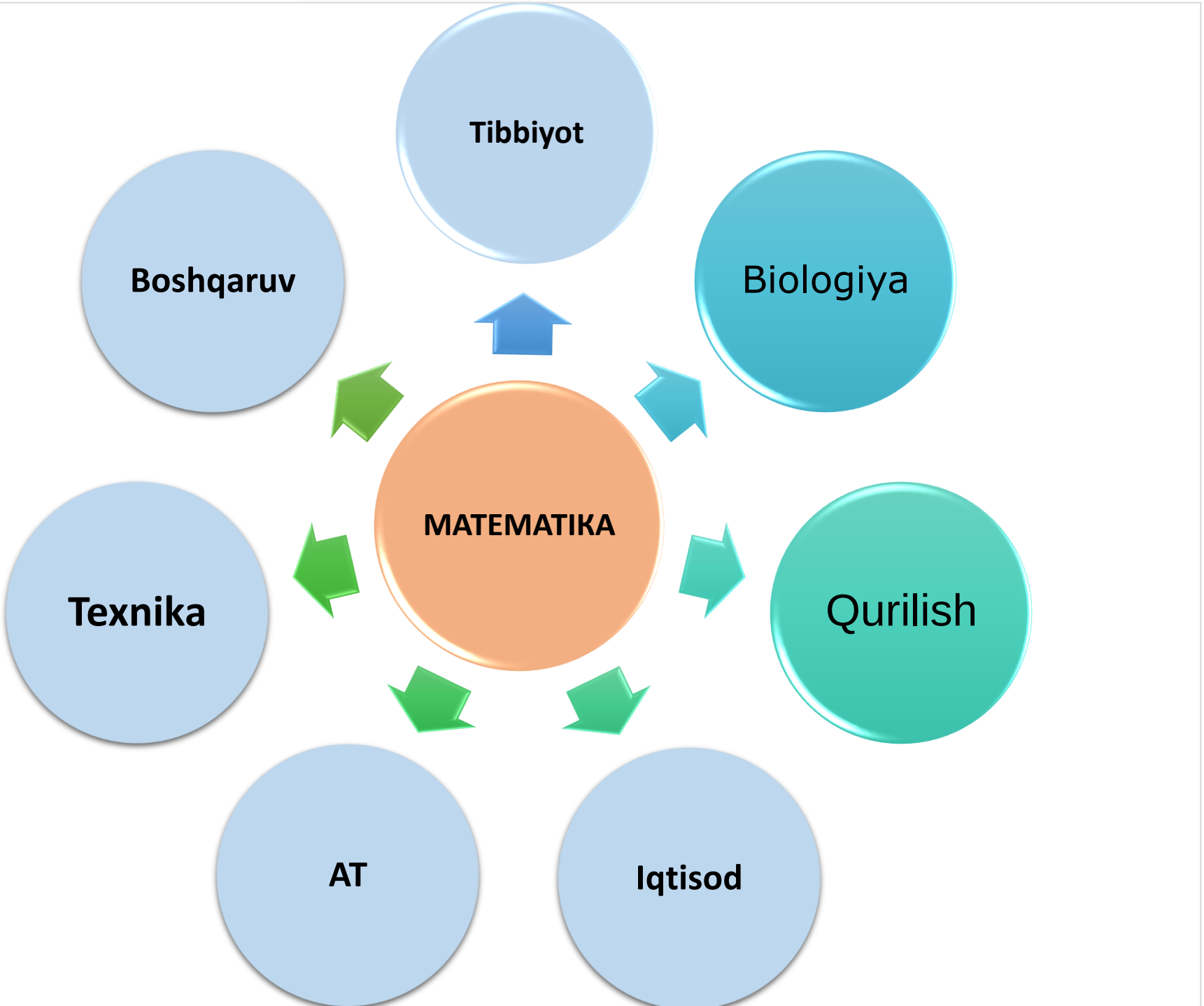
O‘zbekiston Respublikasi Ta’limni rivojlantirish respublika ilmiy-metodik markazi

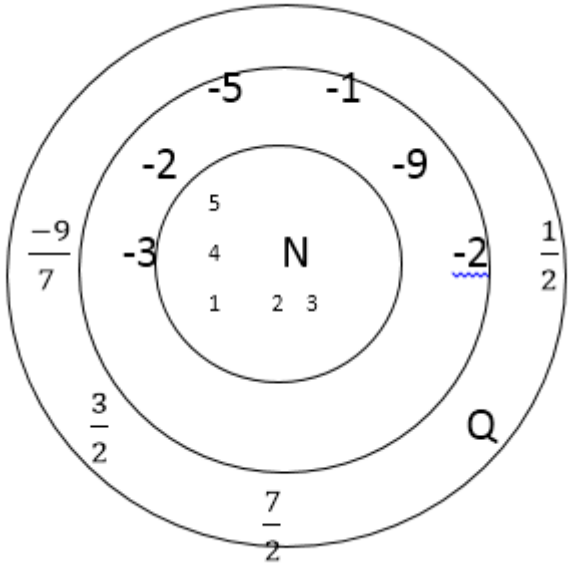
OLAMNI O’RGANISH VA UNI YAXSHILASHDA MATEMATIKADAN FOYDALANAMIZ"

KOSHNAZAROV R.A. Nizomiy nomidagi Toshkent Davlat pedagogika universiteti katta o‘qituvchisi

TA’LIMDAGI O‘ZGARISHLAR

Mamlakatimizda ta’lim sohasiga katta e’tibor qaratilishi natijasida insonlarning yashash sharoitlari yaxshilanganligini ko‘rish mumkin. Bizning mamlakatimizda ham ta’lim turli sohalarga yo‘naltirilgan bo‘lib rivojlangan mamlakatlar qatoriga kirishga harakat qilinmoqda. Ta’lim islohotlarining zamonaviy bosqichi jamiyatda yuz berayotgan yangilanishlarning tezkorligi, ta’lim muassalariga qo‘yilayotgan yangi, yanada yuqori talablarga tezroq moslashish bilan bog‘liq dolzarb vazifalarni ilgari surmoqda. O‘zbekistonda ta’lim-tarbiya sohasini isloh qilishning asosiy omillaridan biri bu – ta’lim jarayoniga zamonaviy innovatsion va axborot-kommunikatsiya texnologiyalarini joriy etishdir


Tibbiyot
Biologiya
Qurilish
Iqtisod
AT
Texnika
Boshqaruv
MATEMATIKA


-5
-1
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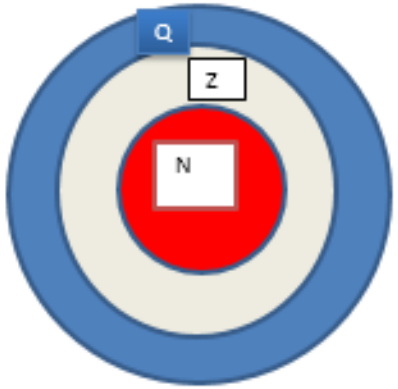
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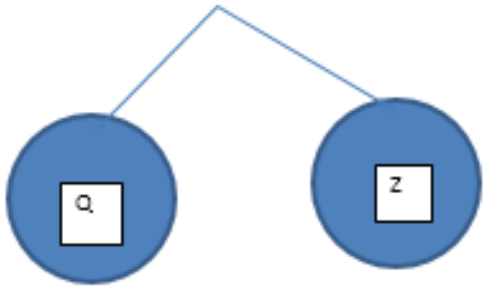
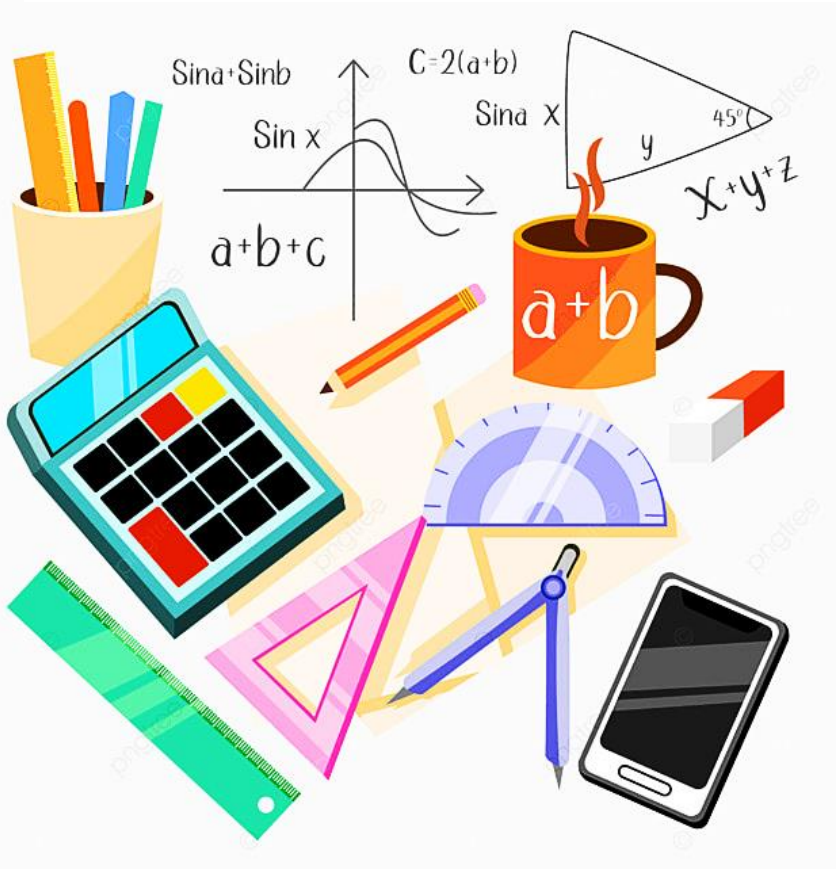
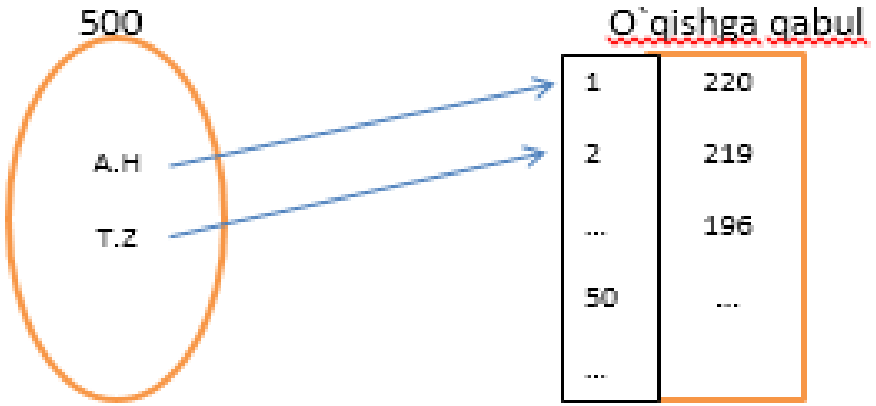

Q
Z

Ta’limga innovatsiyalar, yangi texnologiyalar kirib kelishi nafaqat ta’limni, balki, turli sohalarni rivojlanishiga imkon yaratadi. Davlatimiz aniq va tabiiiy fanlarga, jumladan matematika faniga katta e’tibor qaratmoqda. Prezident maktablari, Al –Xorazmiy maktablarida matematika fani chuqur o‘qitilmoqda. Matematika fanidagi mazmunni boyitishda tushunchalarning tatbiqlariga e’tibor qaratilsa, uning amaliy ahamiyati yanada yuqori bo‘lar edi.

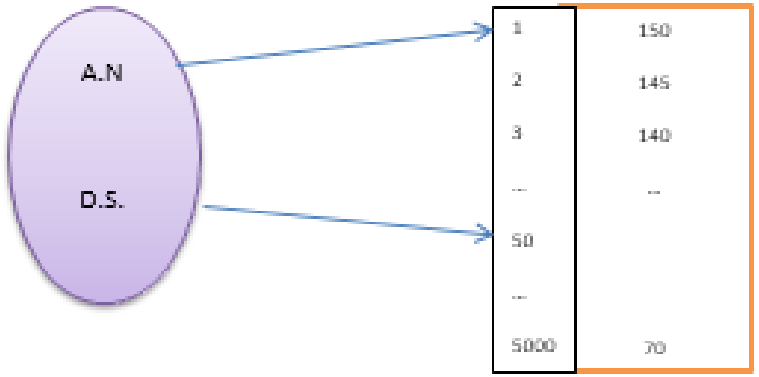


1-misol.



2-misol.

Xarbiy xizmatga yuborish. Xarbiy xizmatga bormoqchi bo`lgan o`g`il bolalar soni 500ta ulardan 50tasi xarbiy xizmatga borish kerak.



O‘zbekiston Respublikasi Oliy ta’lim tizimini 2030- yilgacha rivojlantirish konsepsiyasida bir qator maqsadlar belgilab berilgan

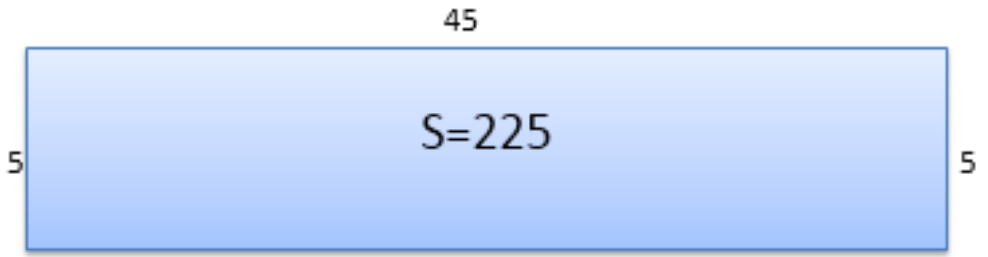
mamlakatni modernizatsiya qilish, ijtimoiy-iqtisodiy jihatdan barqaror rivojlantirish uchun yuqori malakali kadrlar tayyorlash sifatini oshirish, inson kapitalini mehnat bozori talablari asosida rivojlantirish;

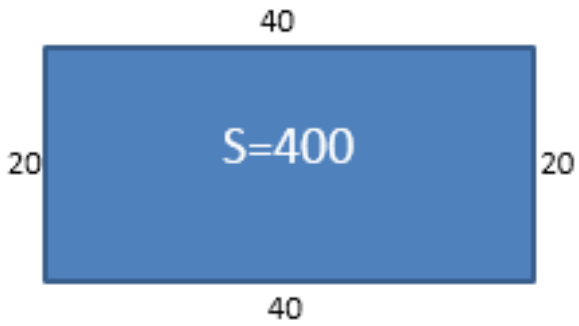
oliy ta’lim bilan qamrov darajasini oshirish, xalqaro standartlar asosida yuqori malakali, kreativ va tizimli fikrlaydigan, mustaqil qaror qabul qila oladigan kadrlar tayyorlash, ularning intellektual qobiliyatlarini namoyon etishi va ma’naviy barkamol shaxs sifatida shakllanishi uchun zarur shart-sharoit yaratish;

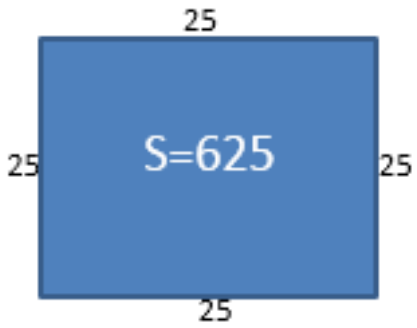
sohada sog‘lom raqobat muhitini shakllantirish, uning jozibadorligini oshirish, jahon miqyosidagi raqobatbardoshligini ta’minlash asosiy maqsadlardan qilib belgilandi.

3-misol.

100 metrli arqon bilan to'g'ri to'rtburchakli maydon o'rang.

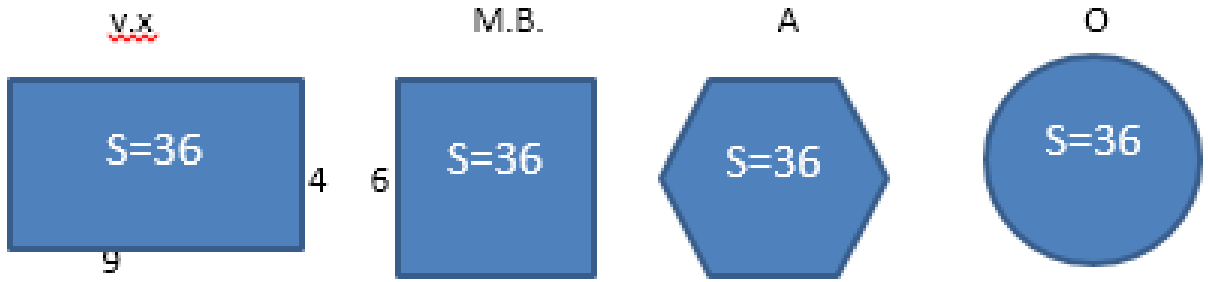






4-misol.

Yuzasi 36 ga teng tekis maydonlar farqini taxlil qiling.



Bu shakllarni yuzasi bir xil bo`lgani bilan, lekin perimetri xar xil bo`lgani uchun ularni o'rash uchun ketadigan material har bil bo`ladi.

Masalan.

V.X. $P = 2 \times (4 + 9) = 2 \times 13 = 26$

M.B. $P = 4 \times 6 = 24$

A. $P = 22$

O. $\pi R^2 = 36 \qquad P = 2\pi R = 20$


CHANCE
CHANEL
TENDRE


Miss Dior


Maison
Francis Kurkdjian
Paris
Baccarat
Rouge 540


ELIE SAAB
LE PARFUM
in white


Flora
by
GUCCI
GENEROUS
VIOLET


Kirkè
eau de parfum


GOLDEA

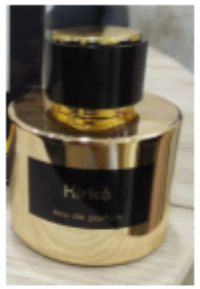

CHANCE
CHANEL
CHANCE
CHANEL


INCANDESSENCE

1. ATIRNING QUTISI QAYSI SHAKLDA TAYYORLANGANI MAQSADGA MUVOFIQROQ?

1-PARALELLIPEPID SHAKLIDAGI ATIR, AYTAYLIK ICHIGA 100ML HAJMDAGI ATIR KETSIN, QUTISINI ISHLATISHGA $20CM^3$ SHISHA KETADI

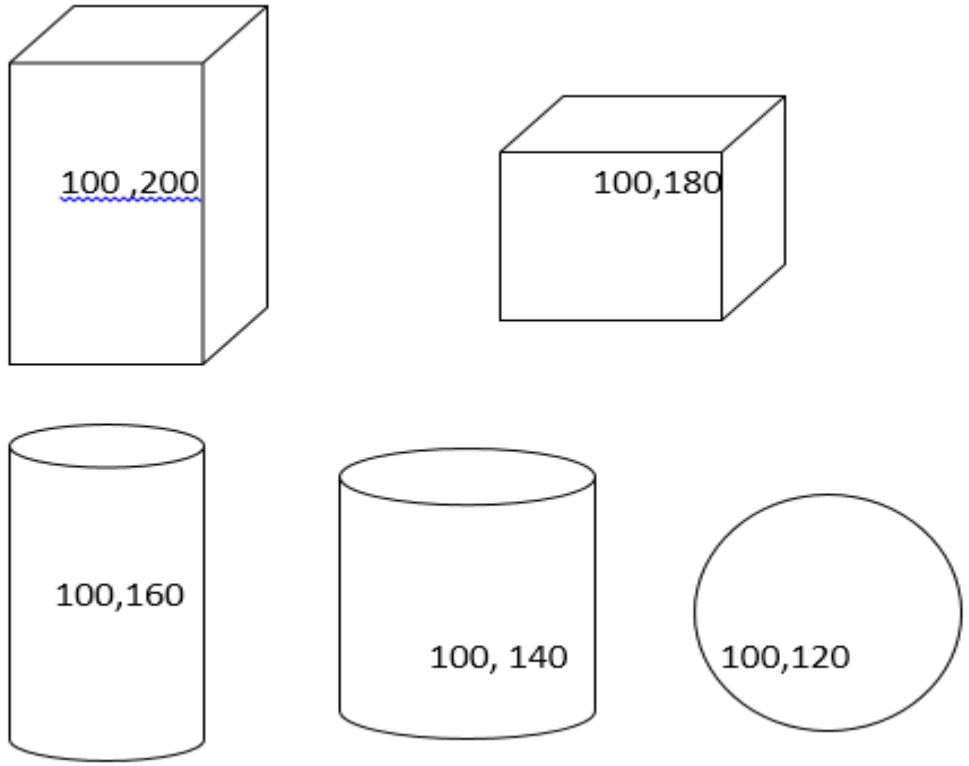
PRIZMA SHALDAGI ATIRGA HAM, SHU HAJMDAGI SUYUQLIK KETADI, AMMA QUTISIGA KAMROQ $18CM^3$ SHISHA ISHLATILADI

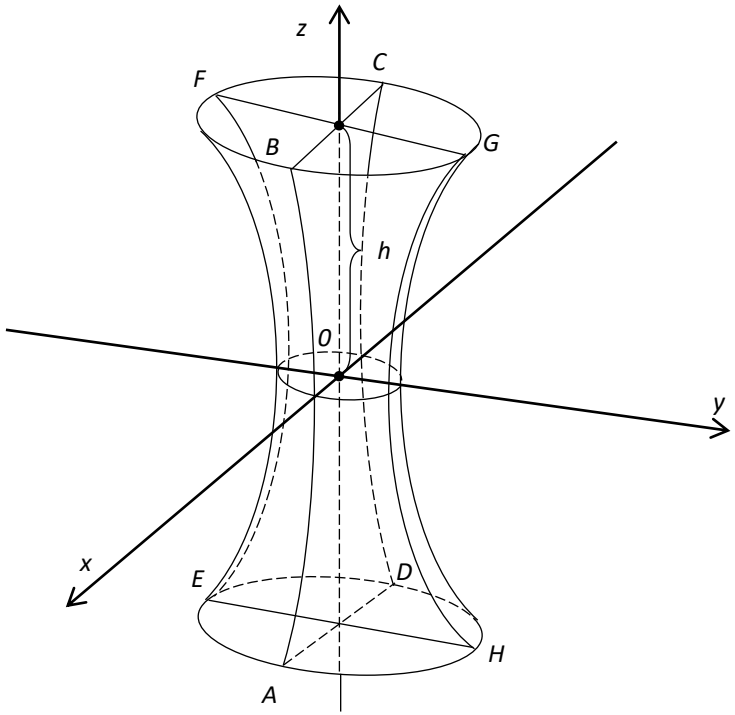


SLINDR SHAKLIDAGI PRIZMA SHAKLIDAGIDAN KAMROQ $16CM^3$ SHISHA KETADI

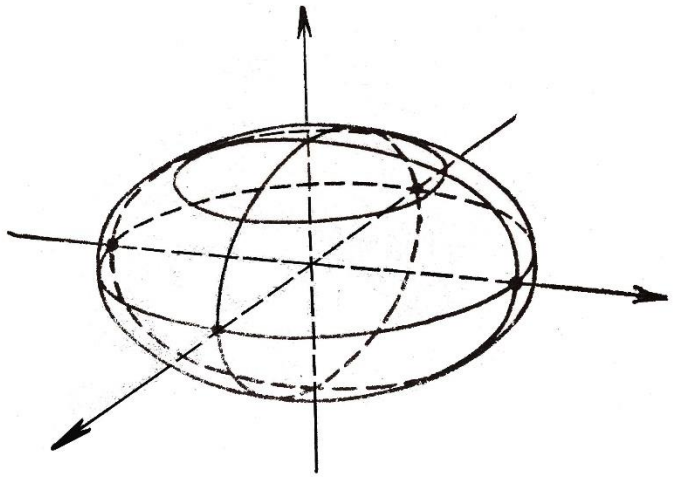
SHAR SHAKLIDAGI ATIRGA ESA, SUYUQLIK BIR XILKETADI, AMMO $14CM^3$ SHISHA KAMROQ KETADI

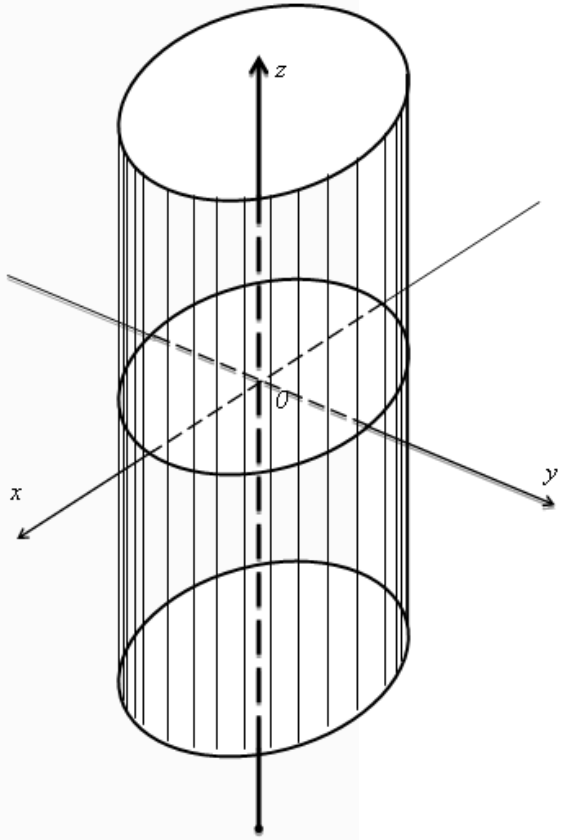
Geometrik fiquralar hajmi va to‘la sirti



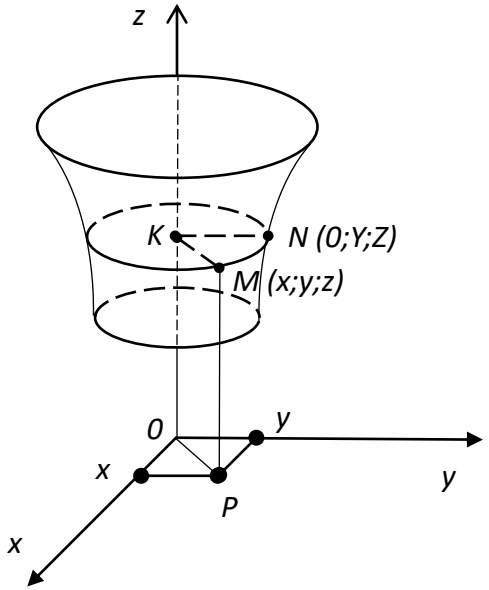


12-chizma

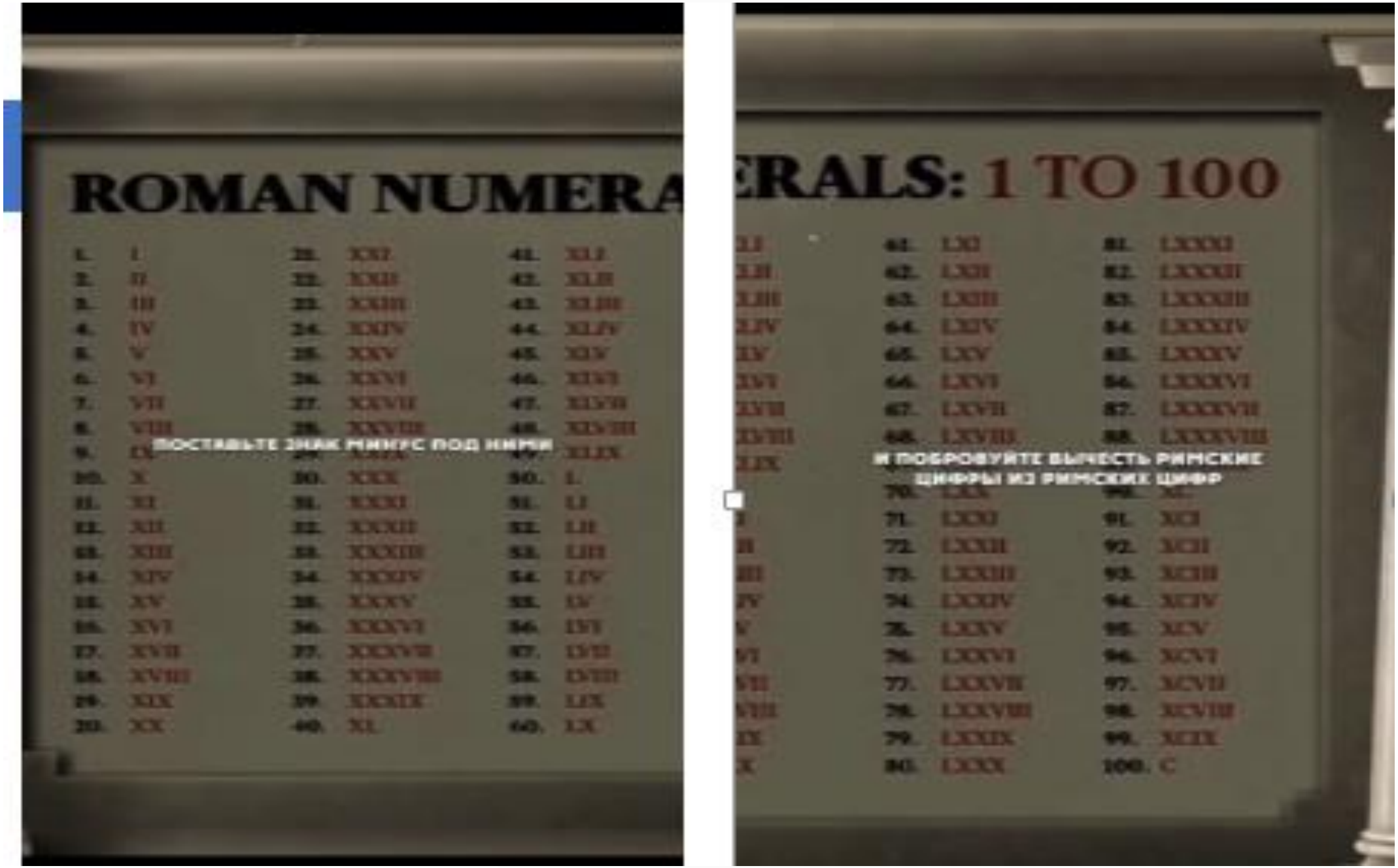




6-chizma



10-chizma


ROMAN NUMERA
ERALS: 1 TO 100
ПОСТАВЬТЕ ЗНАК МИНУС ПОД НИМИ
И ПОПРОБУЙТЕ ВЫЧЕСТЬ РИМСКИЕ ЦИФРЫ ИЗ РИМСКИХ ЦИФР

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01734 56789

АЛЬ-ХОРЕЗМИ ИЗОБРЕТАЕТ
АЛГЕБРУ И АРАБСКИЕ ЦИФРЫ

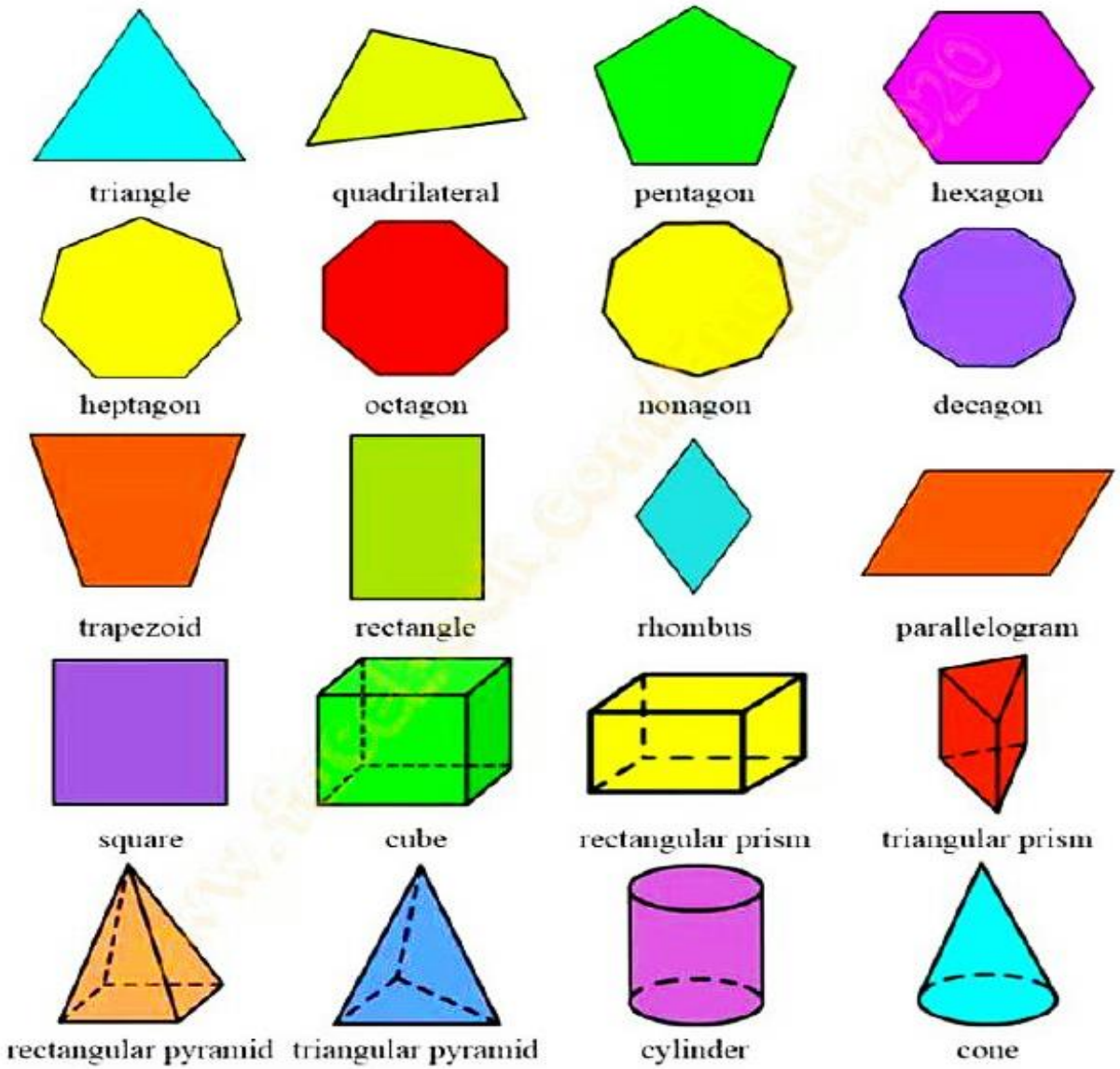
ARABIC NUMBERS

NUMBERS & ANGLES

THE MATHEMATICIAN MUHAMMAD
IBN MUSA AL-KHWARIZMI (780-850)
DESIGNED ARABIC NUMBERS
BASED ON ANGLES.


МОЛОКО
ЦЕЛЬНОЕ
СГУЩЕННОЕ
С САХАРОМ

Matematik savodxonlikni rivojlantiruvchi metodlar



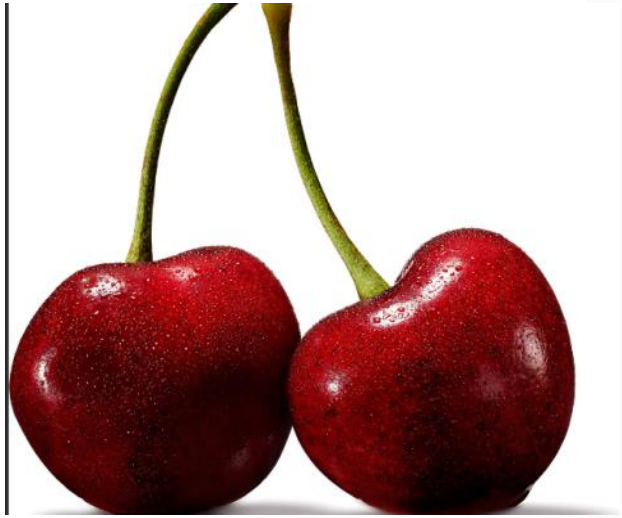
6-misol.

Choynak ichlab chiqaradigan fabrikaning shishani tejab qolish uchun o‘ylab topgan g‘oyalari.

Bu fabrika ham birinchi bo‘lib xuddi “Chanel” atir ishlab chiqaradigan fabrikaga o‘xshab to‘g‘ri to‘rtburchak shakli choynaklar ishlab chiqaradi.

To‘g‘ri to‘rtburchak choynaklaridan keyin choynak ishlab chiqarish fabrikasi silindr shaklidagi choynaklarni ishlab chiqa boshladi. Bu choynaklar to‘g‘ri to‘rtburchak choynaklaridan ko‘ra silindr shaklidagi choynaklarga kamroq shisha ketadi.

Silindr shakldagi choynaklarni ishlab chiqishga nisbatan shar shaklidagi choynakni ishlab chiqish chinnini tejashga olib keladi.



DUMALOQ KARTOSHKA PO`STLOG`INI ISTE`MOLGA YAROQLI BO`LISHI UCHUN ARCHGANIMIZDA, KAMROQ CHIQINDI CHIQADI. SHUNING UCHUN UNING SHAKLI DUMALOQ, BOSHQ SHAKLDA EMAS

OLCHA ISTE`MOLGA YAROQLI BO`LISHI UCHUN UNI YUVGANIMIZDA, SUV HAMMA TARAFIGA TEGISHI VA SUV KAM ISROF BO`LGANLIGI SABABLI, OLCHA DUMALOQ SHAKLDA

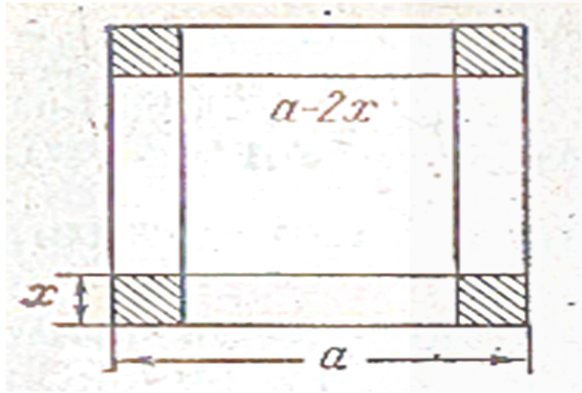
Vaziyatli topshiriqlar(keys qilish mumkin)

- Uzunligi 100 metrli to‘g‘ri to‘rtburchak shaklidagi devor qurish lozim.
- Devor bilan o‘ralgan maydon yuzasi qanday qiymatlarni qabul qila oladi?
- Eng katta yuzali maydonga ega bo‘lish mumkinmi?
- Topshiriq. Maydon yuzasini maydon enining funksiyasi bo‘lishini ko‘rsating va uni tahlil eting.
- Eng katta yuzani aniqlang.

Vaziyatli topshiriqlar

- 18x18 o‘lchamli, kvadrat shakldagi qattiq qog‘oz berilgan. Uning burchaklaridan bir xil kvadratchalar qirqib olib, qolgan shakldan usti ochiq parallelepiped shakldagi quticha yasash talab qilinadi.
- Bu vaziyatni o‘rganish uchun funksiyadan foydalaning.
- Har xil hajmli quticha yasash imkoni bormi?
- Eng katta hajmli quticha yasang.
- Topshiriq. Quticha hajmining qirqib olingan kvadratchalar tomonining funksiyasi bo‘lishini ko‘rsating va uni tahlil eting

3-misol. Tomoni a bo'lgan kvadrat tunukadan uning chekkalaridan bir hil kvadratchalar qirqib tashlab qolgan qismini buklab usti ochiq quticha yasash talab qilinadi. Hajmi eng katta bo'ladigan quticha yasash uchun qirqiladigan kvadratlarning tomoni qanday bo'lishi kerak? (5-chizma).



5-chizma

Yechilishi. Qirqib olinadigan kvadrat tomoni x ga teng bo'lsin, u holda yashikning tubini tashkil qiluvchi kvadratning tomoni $a - 2x$ ga teng. Yashikning hajmi:

$$V = (a - 2x)^2 x = a^2 x - 4ax^2 + 4x^3.$$

Masalani yechish uchun V funksiyaning $(0, a/2)$ intervaldagi eng katta qiymatini topish kerak. $V' = a^2 - 8ax + 12x^2$ hosilani topamiz. $a^2 - 8ax + 12x^2 = 0$ tenglamani yechib, ko'rsatilgan intervalga tegishli bo'lgan $x = a/6$ kritik nuqtani topamiz. $x = a/6$ nuqtada ikkinchi hosila $V'' = — 8a + 24x$ manfiy bo'lgani uchun $[V''\left(\frac{a}{6}\right) = -8a + 24 \cdot \frac{a}{6} = -4a < 0]$, $x = a/6$ nuqtada V maksimumga erishadi:

$$V_{max} = \left(a - \frac{2a}{6}\right)^2 \frac{a}{6} = \frac{2}{27} a^3.$$

Tort uchun karobkadan quti yasash.

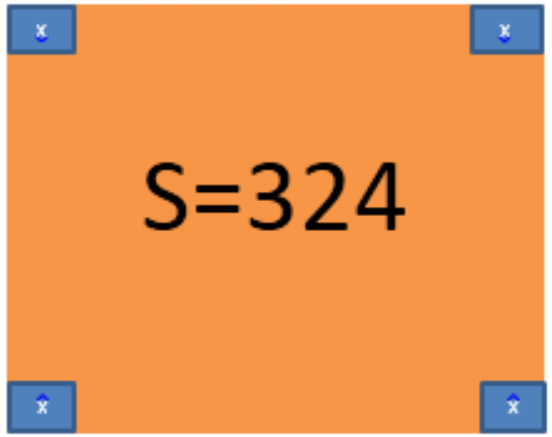
V=abc

a=18-2x

b=18-2x

c=x

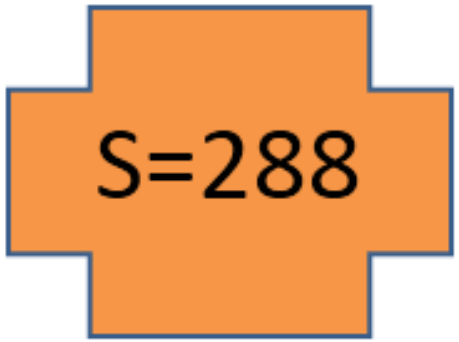
$V=(18-2x)^2 8$

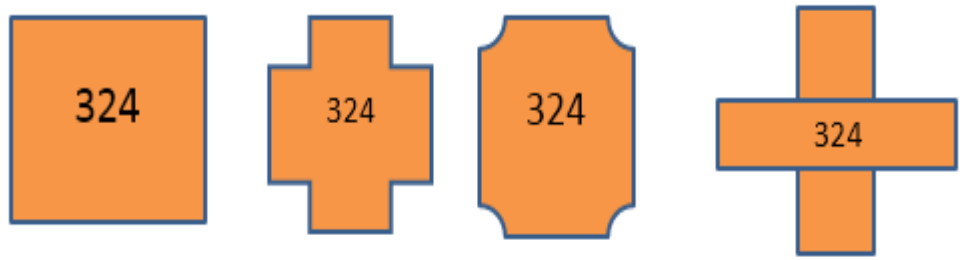


V(1)=256cm³ dan qutidan 4cm² chiqindi chqadi.

V(2)=392 dan esa 16 chiqndi

V(3)=432dan 36 chiqindi.





V>432

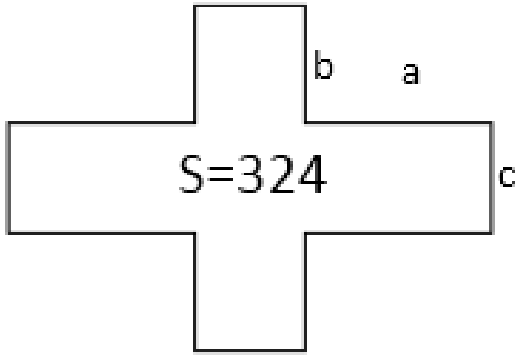
V>abc

ab+2bc+2ac=324

1-masala.

Bizga

Shu ko`rinishdagi figura berilgan. Bu figurani shunday joylashtirish kerakki. Hajmi eng katta bo`lgan idish yasash kerak.

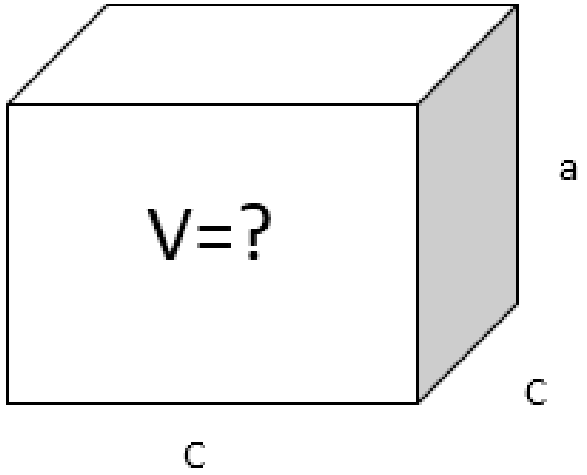


1-rasm

Bu figura hajmi eng katta bo`lishi uchun

1-rasmdagi figuradan a=b shartni

qanoatlantirish kerak.



Hajmi: $V = c^2 \cdot a$

$S=c^2+4ac=324 \qquad a=\frac{324-c^2}{4c}$

$S=c^2+4ac=324 \qquad a=\frac{324-c^2}{4c}$

Hosila olamiz. V'=0

$\left(c^2 \cdot \frac{324-c^2}{4c}\right)'=0$

$(\frac{324c-c^3}{4})'=0$

$324 = 3c^2 \qquad\qquad a = \frac{216}{24\sqrt{3}} = 3\sqrt{3}$

$c^2 = 108$

$c = 6\sqrt{3}$

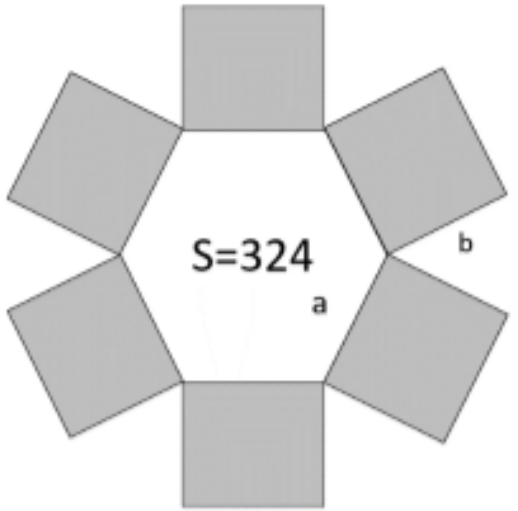
$V = 108 \cdot 3\sqrt{3} = 324\sqrt{3} \approx 561.184$

Xulosa: Agar a tomon $3\sqrt{3}$ va c tomon $6\sqrt{3}$ ga teng bo`lganda hajmi eng katta bo`lgan idish yasash mumkin.

Javob: $V = 561.184$

2-misol.

Bizga berilgan feguraning eng katta hajmga ega bolishini ko`rib o`tsak.



Bu figuraning yuzasi:

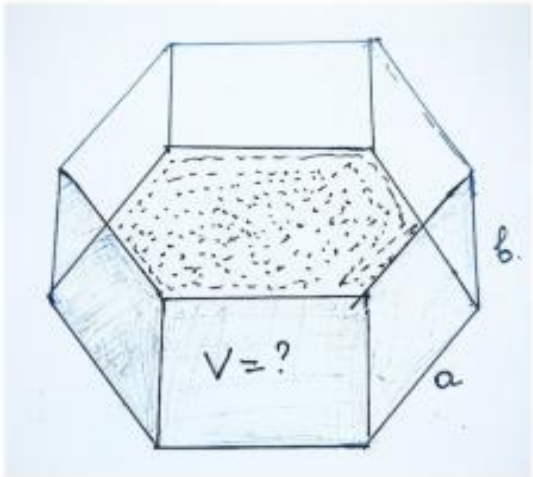
$$S = 6ab + \frac{3\sqrt{3}a^2}{2} = 324$$

Bu tenglikdan b ni a orqali ifodalab olamiz.

$$b = \frac{216 - \sqrt{3}a^2}{4a}$$

Ko`rinishida ifodalab oldik.

Endi biz berilgan figuraning eng katta hajmini hisoblab olamiz.



Hajmi formulasi:

$$V = \frac{3\sqrt{3}}{2} a^2 \cdot b$$

Formula yordamida topiladi.

Eng katta hajmga ega bo`lishi uchun

$$V' = 0$$

Shart bajarilishi kerak.

$$\left(\frac{3\sqrt{3}}{2} \cdot a^2 \cdot \frac{216-\sqrt{3}a^2}{4a}\right)' = 0 \quad 324\sqrt{3} - 13{,}5a^2 = 0$$

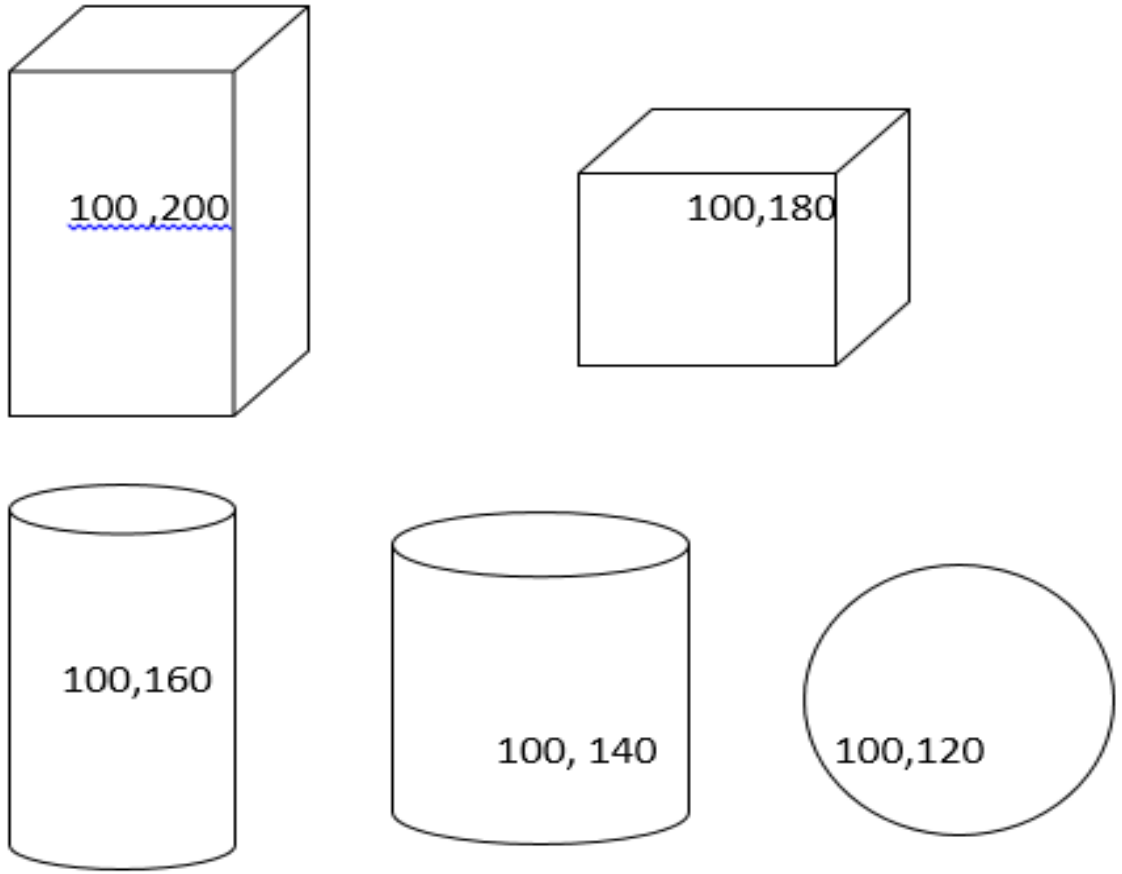
$$a = 2\sqrt{6\sqrt{3}} \qquad b = 3\sqrt{2\sqrt{3}}$$

Hajmi:

$$V = \frac{3\sqrt{3}}{2} a^2 \cdot b = \frac{3\sqrt{3}}{2} \cdot 24\sqrt{3} \cdot 3\sqrt{2\sqrt{3}} = 324\sqrt{2\sqrt{3}} = 603.031$$

Javob: $V = 603.031$

Geometrik fiquralar hajmi va to‘la sirti



To‘la sirti 324 cm^2 bo‘lgan yarim sfera olaylik

$\frac{S}{2} = 4\pi R^2 \cdot \frac{1}{2} = 324$ см^2 $2\pi R^2 = 324$ см^2 $\pi R^2 = 162$ см^2

$R^2 = \frac{162}{\pi} \approx 51$ R ≈ 7 $\frac{V}{2} = \frac{4}{3}\pi R^3 \cdot \frac{1}{2}$

Formulaga ko’ra

$\frac{V}{2} = \frac{4}{3}\pi \cdot 7^3 \cdot \frac{1}{2} \approx 700$ см^3

sferaning $\frac{1}{8}$ qismi olinsa

$\frac{S}{8} = 4\pi R^2 \cdot \frac{1}{8} = 324$ см^2 $\frac{1}{2}\pi R^2 = 324$ см^2

$\pi R^2 = 648$ см^2

$R^2 = \frac{648}{\pi} \approx 206$

R $\approx$ 14 bo'ladi. Formulaga ko'ra

$\frac{V}{8} = \frac{4}{3}\pi R^3 \cdot \frac{1}{8}$

$\frac{V}{8} = \frac{4}{3} \cdot \pi \cdot 14^3 \cdot \frac{1}{8} \approx 1436$ см^3

Hajmga ega bo'lamiz

$\frac{S}{16} = 4\pi R^2 \cdot \frac{1}{16} = 324$ см^2

$\frac{1}{4}\pi R^2 = 324$ см^2

$\pi R^2 = 1296$ см^2

$R^2 = \frac{1296}{\pi} \approx 412$

$R \approx 20$

$\frac{V}{16} = \frac{4}{3}\pi R^3 \cdot \frac{1}{16}$

$\frac{V}{16} = \frac{4}{3} \cdot \pi \cdot 20^3 \cdot \frac{1}{16} \approx 2094$ см^3

E’TIBORINGIZ UCHUN RAXMAT!