



Ta'limni rivojlantirish  
respublika ilmiy-metodik  
markazi

# Matematika fanida kasrlar va funksiyalarni o'qitishda zamonaviy usullar

**Gafforova Sarvinoz Asrorovna**

Sirdaryo viloyati pedagogik mahorat markazi Aniq, tabiiy fanlar,  
maktabgacha, boshlang'ich va maxsus ta'lim metodikalari  
kafedrasida matematika fani katta o'qituvchisi



# Kasr tushunchasi

“Qism-butun” modeli kasrlarga oid “qism-butun” tushunchalarini tasvirlaydi.

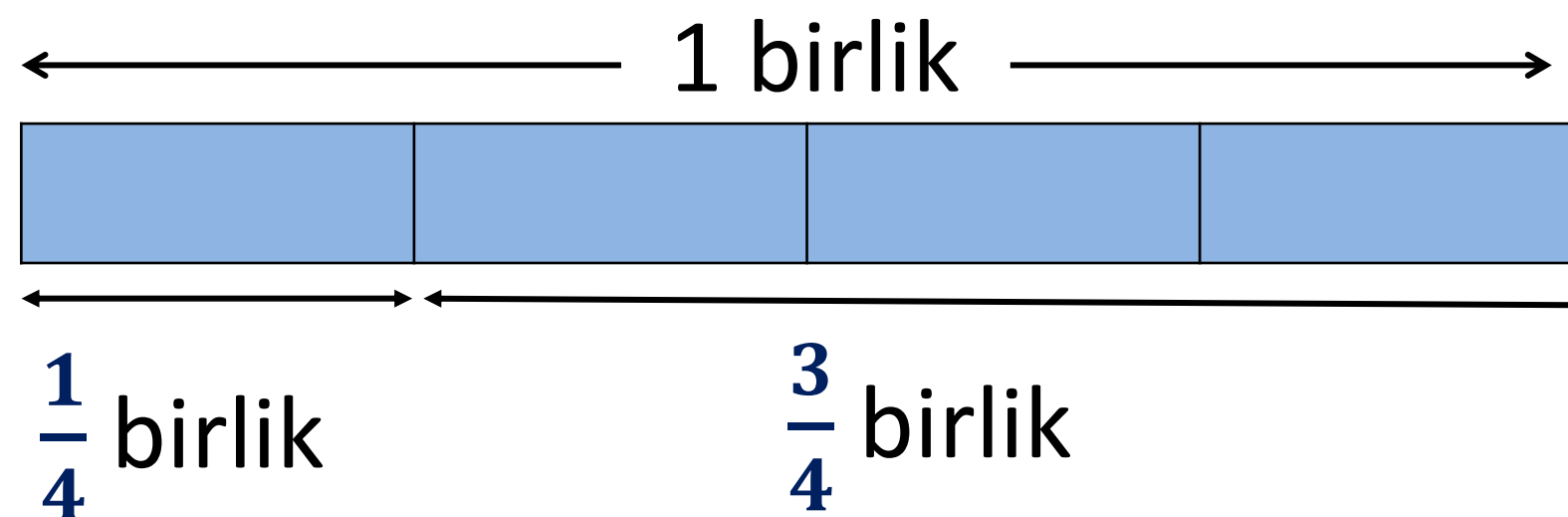
Kasr butunning bir qismini ifodalovchi matematik ifoda.

Masalan:

Butun (1 birlik) 4 ta teng qismga bo‘linganda,

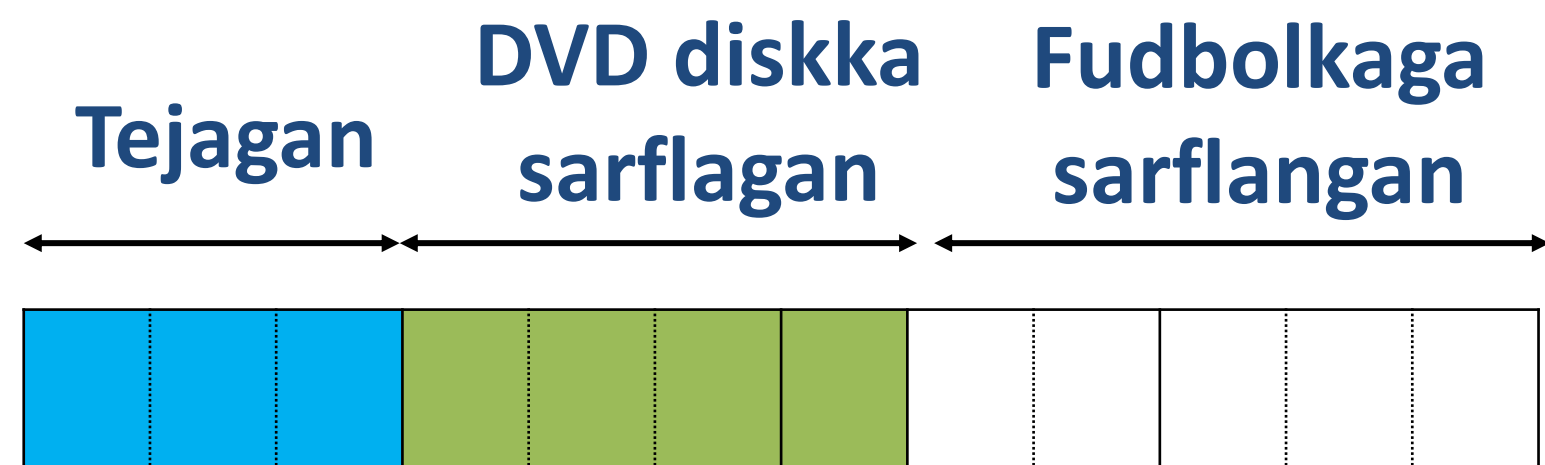
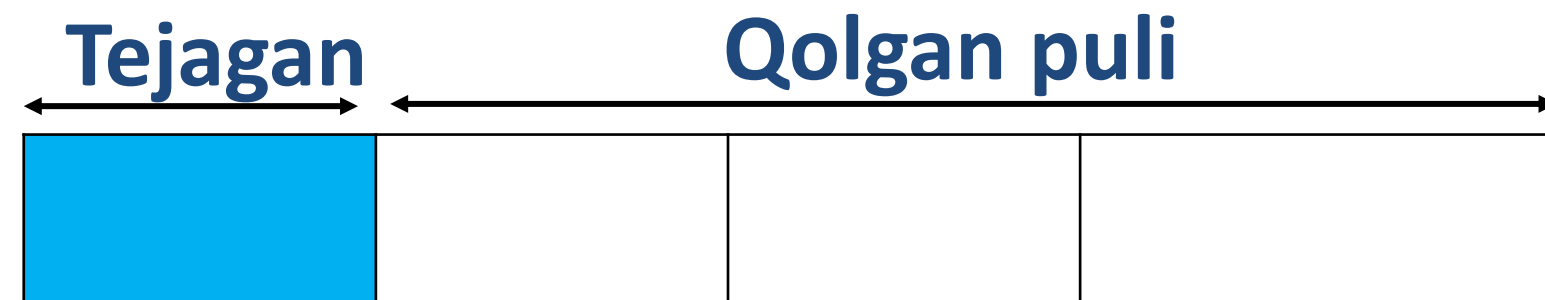
$\frac{1}{4}$  kasr 4 ta teng qismdan 1 tasini (ya’ni  $\frac{1}{4}$  ni),

$\frac{3}{4}$  kasr esa 4 ta teng qismdan 3 tasi olinganini (ya’ni,  $\frac{3}{4}$  ni) bildiradi.



Orif dam olish kunlari qo‘shimcha mehnati uchun ma‘lum maosh oldi. U pulning  $\frac{1}{4}$  qismini tejagan, qolgan qismining  $\frac{4}{9}$  qismini DVD disk olishga sarflagan va qolgan puliga futbolka sotib olgan.

- a) U pulining qancha qismini DVD disk uchun sarflagan?  
 b) U pulining qancha qismini futbolka sotib olishga sarflagan?

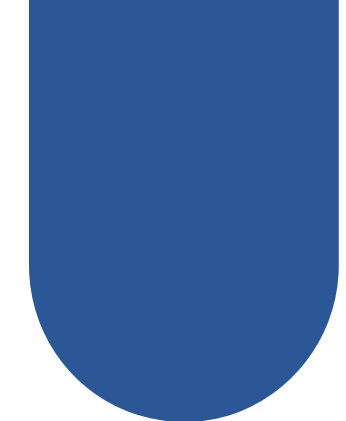


DVD disk uchun sarflangan puli = 4 bo‘lak  
 Futbolkaga sarflangan puli = 5 bo‘lak  
 1 butun = 12 bo‘lak

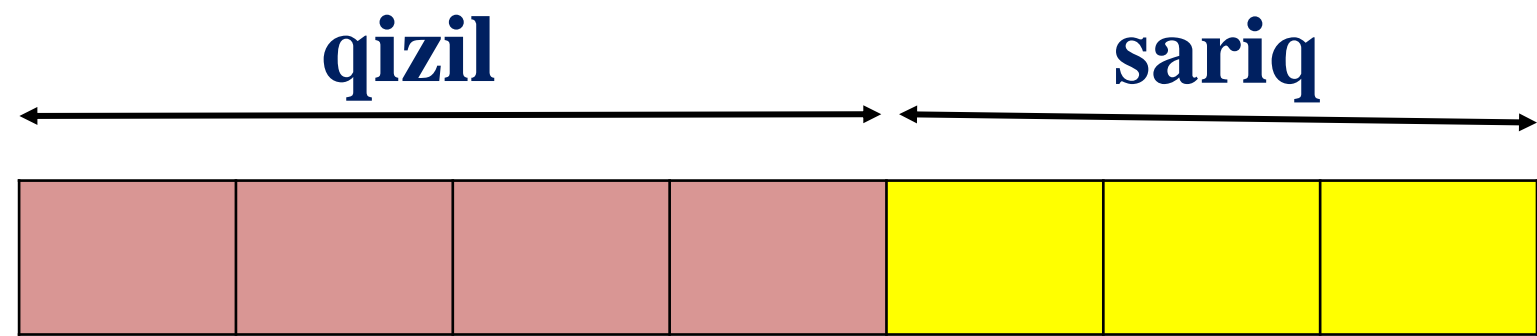
(a)  $\frac{4}{12} = \frac{1}{3}$

pulining  $\frac{1}{3}$  qismini DVD disk uchun sarflagan.

(b) Pulining  $\frac{5}{12}$  qismini futbolka sotib olishga sarflagan.

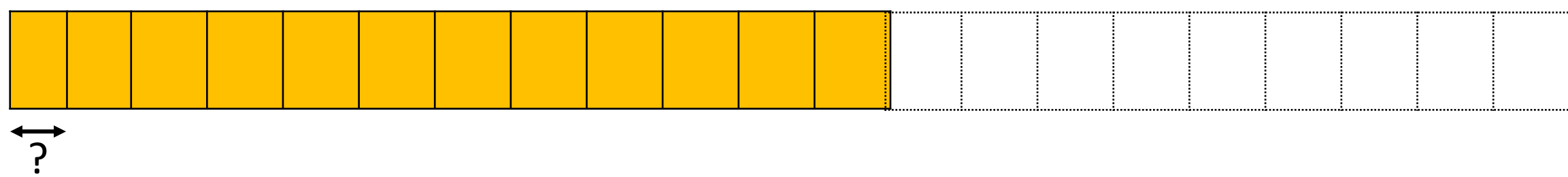


Savatda qizil va sariq pomidorlar bor edi. Ularning  $\frac{4}{7}$  qismi qizil pomidorlar. Barcha qizil pomidorlar 12 ta qopchalarga teng miqdorda qadoqlandi. Har bir qopchaga jami pomidorning qancha qismi qadoqlangan?



$$\frac{4}{7} \div 12 = \frac{4}{7} \times \frac{1}{12} = \frac{1}{21}$$

Har bir qopchaga jami pomidorning  $\frac{1}{21}$  qismi qadoqlangan.



Idishdagi halqalarning  $\frac{3}{4}$  qismi zarg'aldoq, qolganlari esa sariq rangda edi. Malika barcha sariq halqalarni teng qilib qopchalarga joyladi.

(a) Malika nechta qopchaga sariq halqalarni joyladi?

(b) Agar 72 ta zarg'aldoq halqalar bor bo'lsa, har bir qopchaga nechta sariq halqalar joylangan?

$$(a) \quad 1 - \frac{3}{4} = \frac{1}{4}$$

Barcha halqalarning  $\frac{1}{4}$  qismini zarg'aldoq halqalar tashkil

etadi.

$$\frac{1}{4} \div \frac{1}{12} = \frac{1}{4} \times \frac{12}{1} = 3$$

Malika 3 ta qopchaga sariq halqalarni joyladi.

$$(b) \quad \text{Hamma halqalar soni} = 72 \div \frac{3}{4} = 96$$

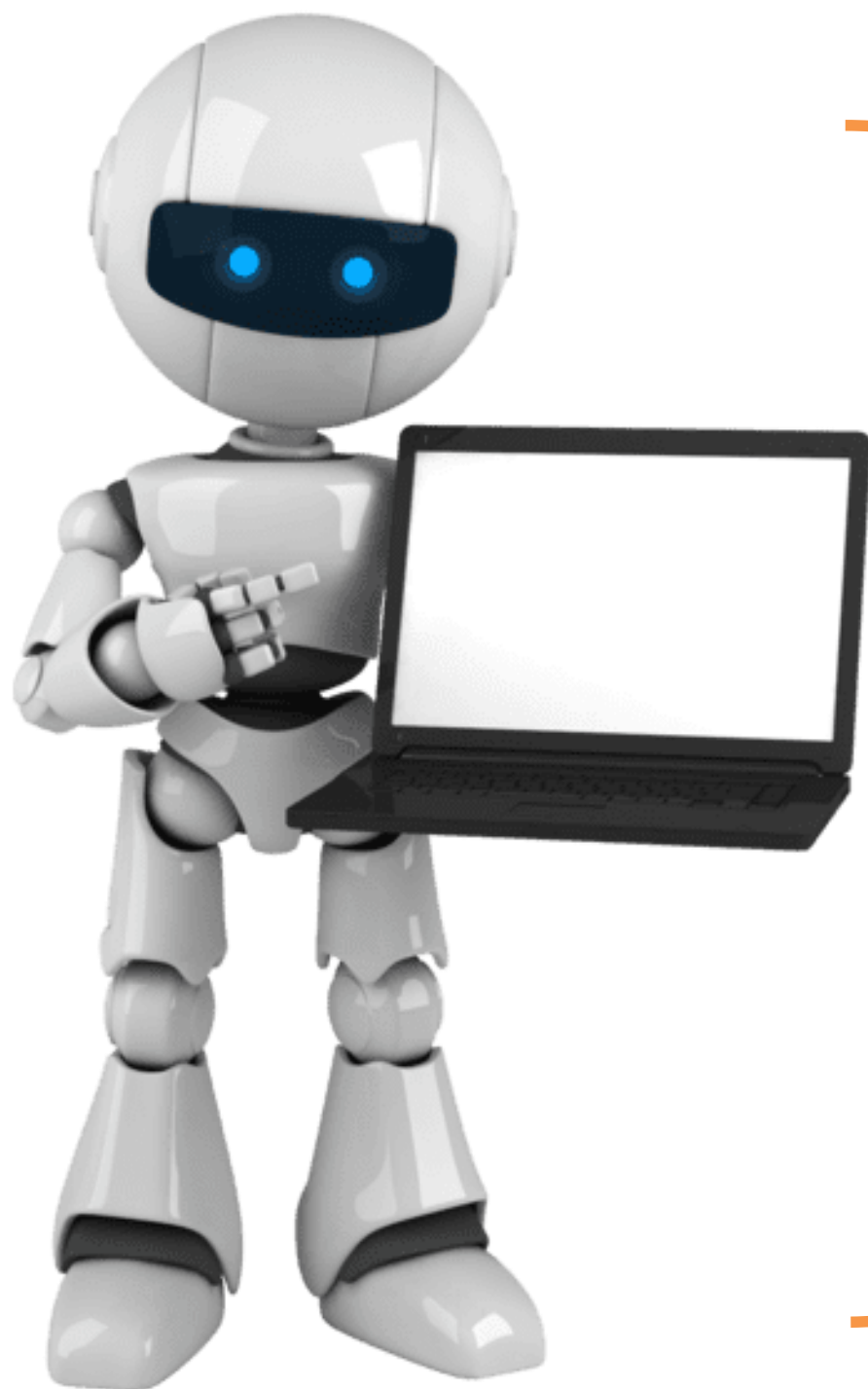
$$\text{Zarg'aldoq halqalar soni} = 96 - 72 = 24$$

$$24 \div 3 = 8$$

Har bir qopchaga 8 ta sariq halqa joylangan.

# PhET Coloradoning imkoniyatlari

<https://phet.colorado.edu/>



To'liq bepul — hech qanday ro'yxatdan o'tish yoki to'lov talab qilinmaydi.

Brauzerda ishlaydi (HTML5) — kompyuter, planshet yoki telefonda yuklamasdan ochiladi



O'zbek tilida mavjud (ko'p simulyatsiyalar 130+ tilda tarjima qilingan, shu jumladan o'zbekcha)

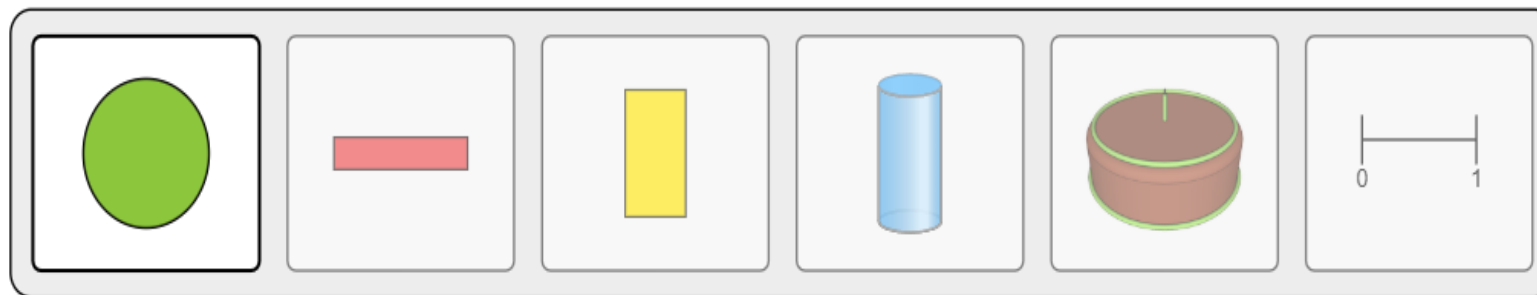


Darsda — o'qituvchi namoyish qiladi yoki guruhlarda ishlatiladi.

Uy vazifasi — mustaqil tajriba qilish



[https://phet.colorado.edu/sims/html/fractions-intro/latest/fractions-intro\\_all.html?locale=uz](https://phet.colorado.edu/sims/html/fractions-intro/latest/fractions-intro_all.html?locale=uz)



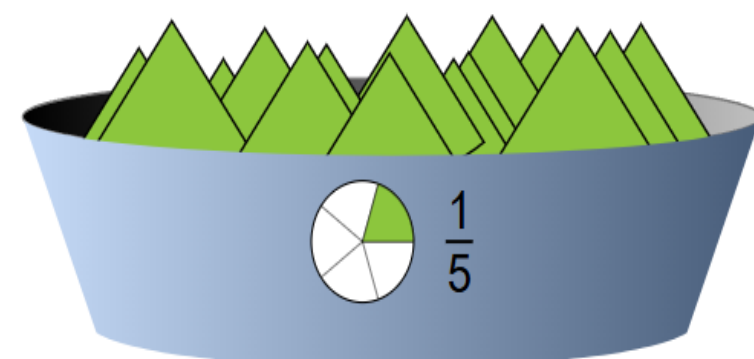
Maksimum  
1

▲  
▼



$$\frac{4}{5}$$

▲  
▼  
▲  
▼



**Khan Academy:** <https://khanacademy.org> (AI Tutor)



Khan Academy

(<https://uz.khanacademy.org/>) —

matematikani vizual tarzda o‘rganish  
uchun interaktiv mashqlar va darslar

taqdim etadi. Turli matematik

mavzularda videolarni ko‘rib, mashqlarni

yechishlari mumkin. Har bir mavzu

uchun sinovlar va baholar mavjud.

Khan Academy hozir Russianda (русский) mavjud! Qiziqasizmi?

Sayt tilini o'zgartirish X

Kashf et ▲

Izlash



sgafforova46 ▼

Matematika >

Tabiiy fanlar >

MATEMATIKA

Boshlang'ich matematika 2%

Arifmetika 2%

Boshlang'ich algebra 1%

Algebra I

Algebra II

Geometriya asoslari 1%

Geometriya

Trigonometriya

Matematik analiz asoslari

Chiziqli algebra

gi boshlang.

0

Daraja 6 ⓘ



1 / 6 ko'nikmalar

Profilni tahrirlash

2,804

0 0 0 0 0 0 1

m Batafsil.

inishi mumkin.

ar ▼

Barcha harakatlar ▼

0 mashq daqiqalari

0 jami ta'lim daqiqalarda

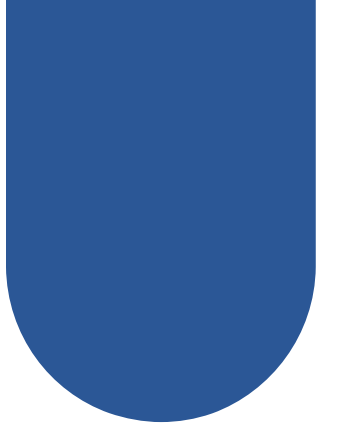
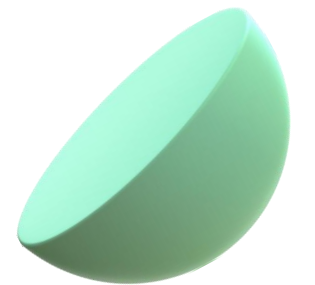
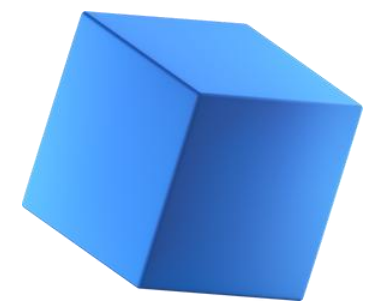
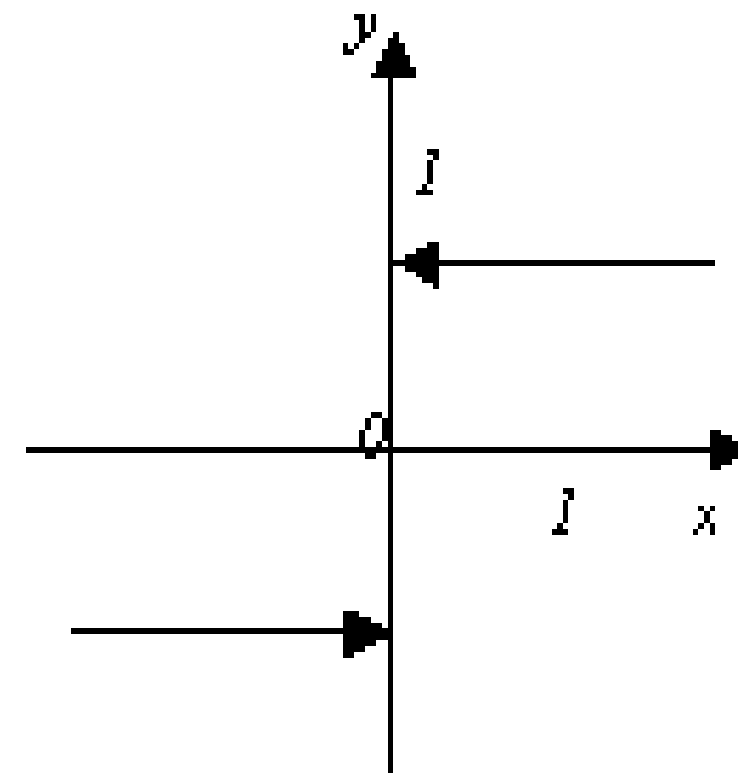
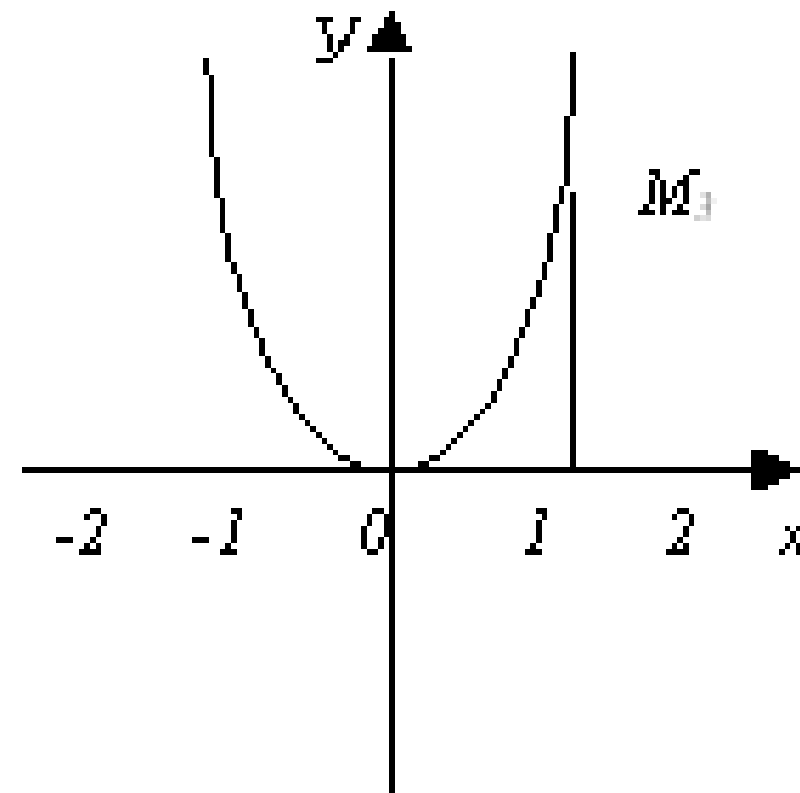
lozircha o'sish yo'q!

hda o'sish bo'lsa, shu yerda ko'rsatiladi.

## TA'RIF

Agar  $x$  miqdorning  $X$  sohadagi har bir qiymatiga biror  $f$  qonuniyatga ko'ra  $y$  miqdorning  $Y$ -sohadan aniq bir qiymati mos keltirilsa,  $y$  miqdor  $x$  miqdorning  $X$ -sohadagi funksiyasi deyiladi va  $y=f(x)$  kabi yoziladi.

$y=x^2$  ning grafigi chizilsin.



# Desmos va uning imkoniyatlari

<https://www.desmos.com/?lang=ru>




- Bepul va onlayn – Desmos brauzer orqali ishlaydi va mutlaqo bepul. Hech qanday o‘rnatish shart emas
- 2009-yilda yaratilgan – Platforma 2009-yilda ishga tushirilgan va tezda butun dunyo o‘qituvchilari orasida mashhur bo‘lgan.
- Faqat grafik emas – Tenglamalar tizimi, statistik hisob-kitoblar, regressiya, jadval bilan ishlash imkoniyati mavjud.
- Ijodiy loyihalar uchun ham ishlatiladi – Ba’zi foydalanuvchilar Desmos yordamida mashhur rasmlar, yurak shakli yoki hatto portretlar ham chizishgan!

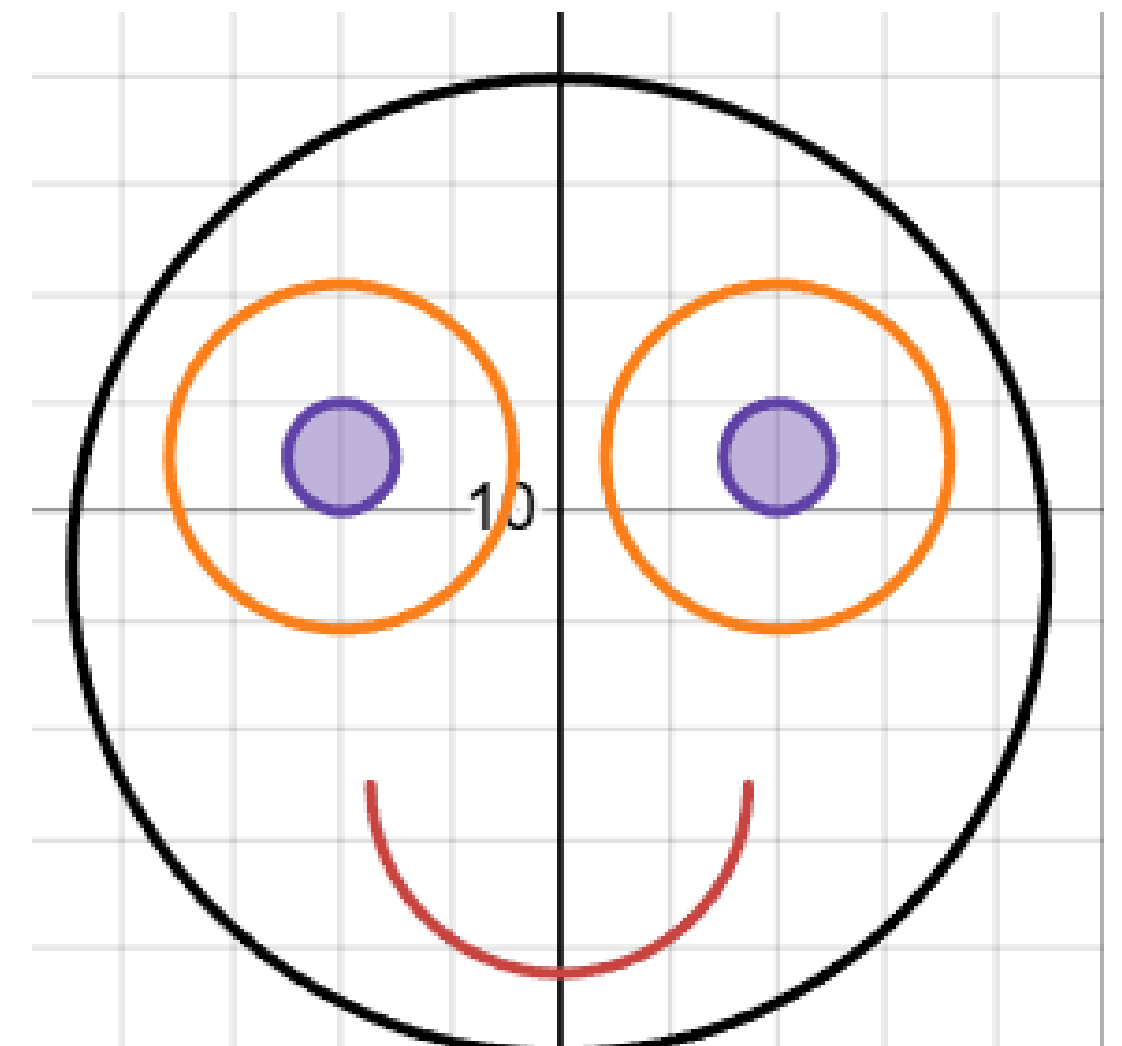
# KELING DESMOSDA TABBASSUM QILAYOTGAN INSON FUNKSIYASINI CHIZAMIZ

Bolalarda darsga bo'lgan qiziqishni oshirish maqsadida aylana formulalarini tushuntirmasdan oldin desmosda quydagi rasmni chizamiz .

Doira bilan bosh, ko'z va og'iz uchun funksiyalar yaratamiz.

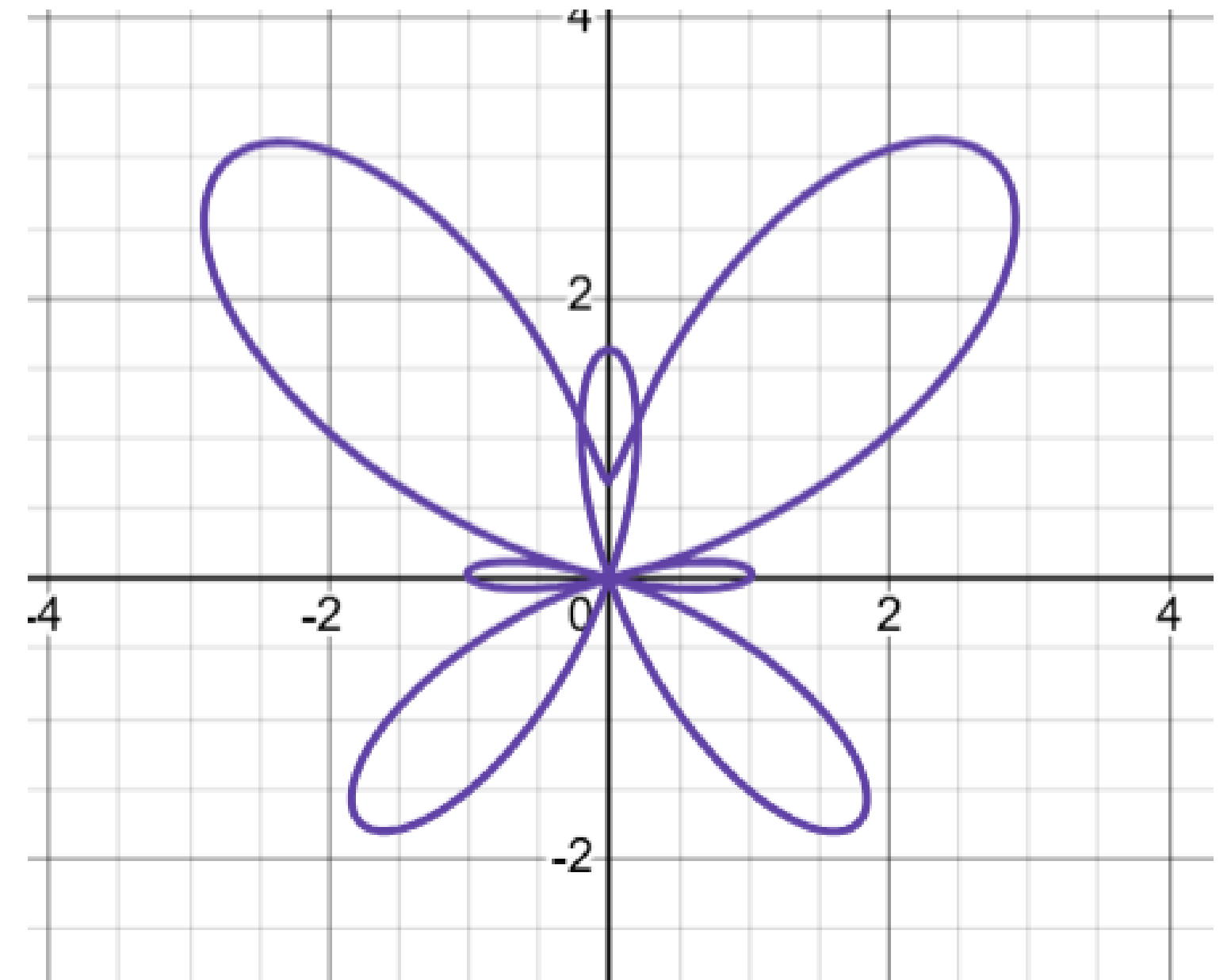
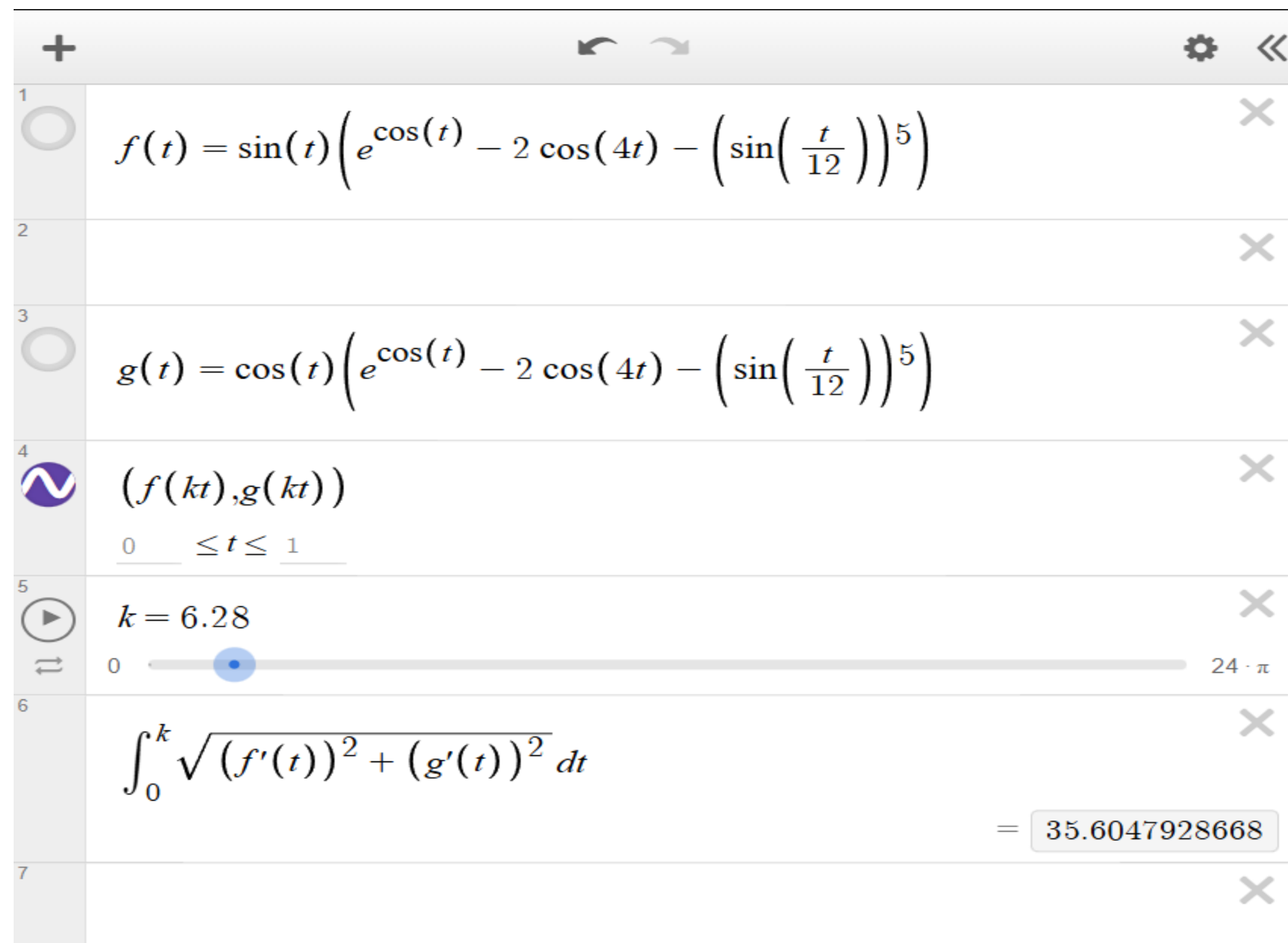
<https://www.desmos.com/calculator/viara5fnvv>

+		⚙️ ⏪
1		$(x - 4)^2 + (y - 11)^2 = 10$ ✕
2		$(x - 4)^2 + (y - 11)^2 \leq 1$ ✕
3		$(x + 4)^2 + (y - 11)^2 = 10$ ✕
4		$(x + 4)^2 + (y - 11)^2 \leq 1$ ✕
5		$(x - 0)^2 + (y - 9)^2 = 80$ ✕
6		$(x - 0)^2 + (y - 5)^2 = 12 \{y \leq 5\}$ ✕



# Qanday qilib kapalak rasmini chizish mumkin?

<https://www.desmos.com/calculator/igjkczipmw>





# Keling desmosda gullarni rasmini chizamiz

**Polar gul — klassik gul shakli**

<https://www.desmos.com/calculator/wehovfv5f1>

**Oddiy, lekin chiroyli polar gul (ko'p bargli gul):**

<https://www.desmos.com/calculator/vvvqdapvyt>

**Aylanib turgan chiroyli gul rangli va harakatli!**

<https://www.desmos.com/calculator/uwqhs1j8pm>

**Yana bir gul misoli (6-8 bargli, oson):**

<https://www.desmos.com/calculator/vz8po6xmww>

## Desmosda insonning rasmini chizish

**Eng yaxshi odamcha— juda kulgili va sodda!**

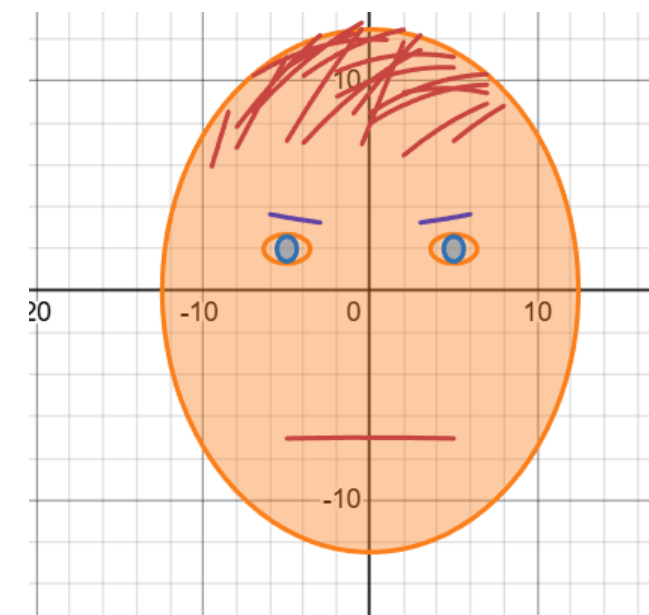
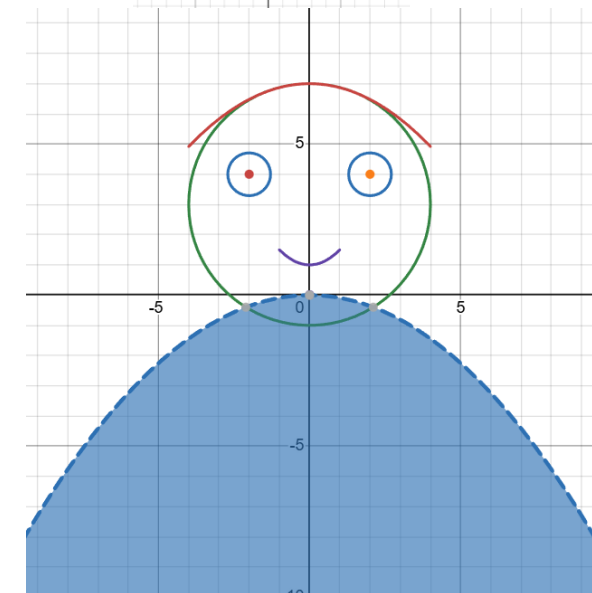
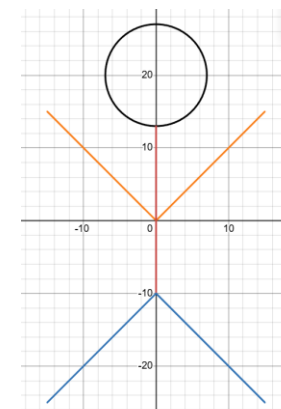
<https://www.desmos.com/calculator/dg3hhevezt>

**To'liq odam shakli— yuz va tanasi bor.**

<https://www.desmos.com/calculator/nbqfh91p0g>

**Odam yuzini chizish**

<https://www.desmos.com/calculator/i1f9mtea7u>



# XULOSA

Ta'limda zamonaviy ta'lim metodikalari Phet Colorado, Khan academy, Desmosdan foydalaning!

O'quvchilaringizga nafaqat hisoblashni, balki matematikani hayotiy misollar orqali o'rgating. Chunki haqiqiy o'qituvchi texnologiyani o'rniga qo'ymaydi — uni qurol qilib oladi.



**E'tiboringiz uchun rahmat!**

