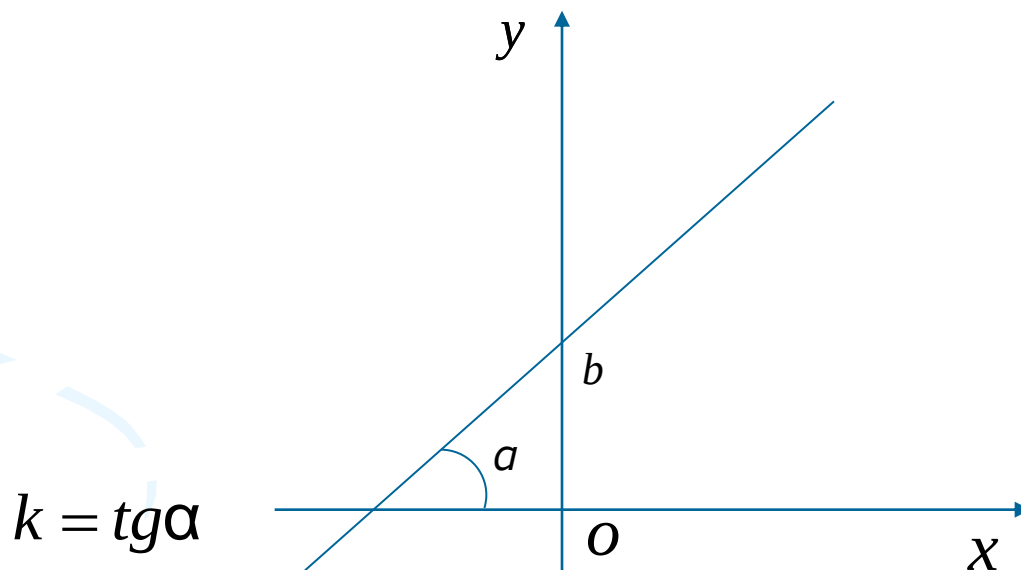
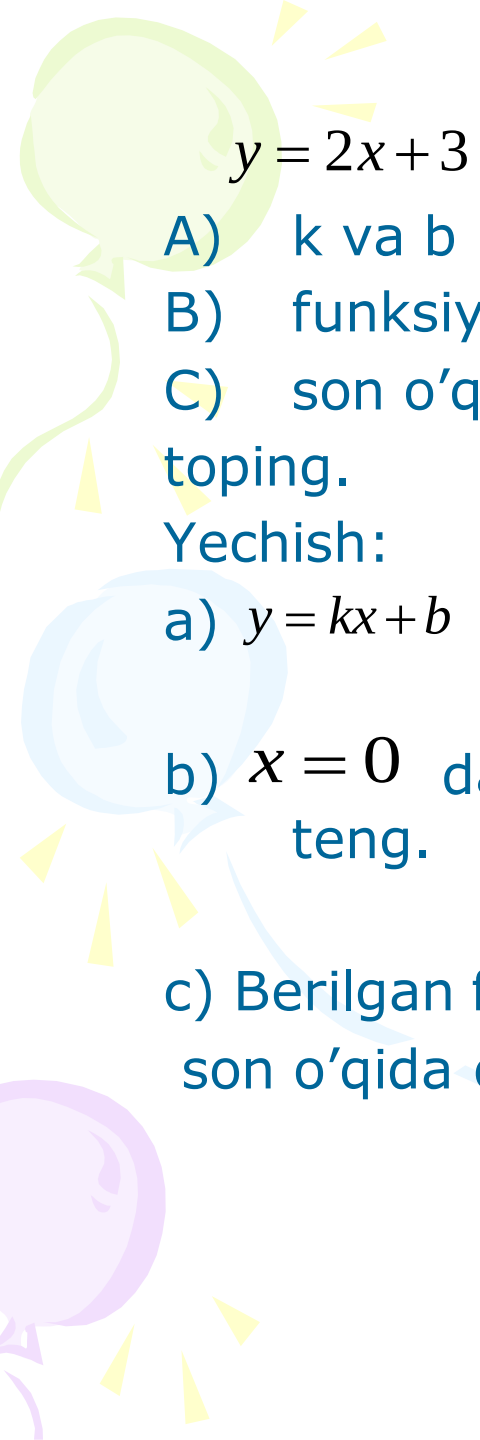


$y = kx + b$ ----- **chiziqli funksiya**

1. Aniqlanish sohasi: $D(y) = R$;
2. Qiymatlar sohasi : $E(y) = R$;
3. $k > 0$ bo'lsa, son o'qida o'suvchi;
 $k < 0$ bo'lsa, son o'qida kamayuvchi;

Bu yerda k to'g'ri chiziqning o'qi bilan hosil qilgan burchak tangensi.





$y = 2x + 3$ chiziqli funksiyada:

- A) k va b larni
- B) funksiyaning nollarini;
- C) son o'qida o'suvchimi yoki kamayuvchimi toping.

Yechish:

a) $y = kx + b$ formulaga ko'ra $k=2$ va $b=3$ ga teng.

b) $x = 0$ da $y = 3$ va $y = 0$ da $x = -\frac{3}{2}$ ga teng.

c) Berilgan funksiyada $k > 0$ bo'lgani uchun son o'qida o'suvchi.

Kvadrat funksiya

$$y = ax^2 + bx + c \quad (a \neq 0)$$

1. Aniqlanish sohasi:

$$D(y) = \left(-\infty; +\infty \right)$$

2. Qiymatlar sohasi:

$$\begin{aligned} a > 0 \quad \text{bo'lsa,} \quad E(y) &= \left[y_0; +\infty \right) \\ a < 0 \quad \text{bo'lsa,} \quad E(y) &= \left(-\infty; y_0 \right] \end{aligned}$$

3. Parabola uchining koordinatalari:

$$x_0 = -\frac{b}{2a}, \quad y_0 = \frac{4ac - b^2}{4a} \Rightarrow y = ax^2 + bx + c = a(x - x_0)^2 + y_0$$

Simmetriya o'qi:

$$x = -\frac{b}{2a}$$

$$a > 0 \quad \text{bo'lsa,} \quad \left[y_0; +\infty \right)$$

oraliqda o'suvchi

$$\left(-\infty; x_0 \right]$$

oraliqda kamayuvchi

$$a < 0 \quad \text{bo'lsa,} \quad \left(-\infty; x_0 \right]$$

oraliqda o'suvchi

$$\left[y_0; +\infty \right)$$

oraliqda kamayuvchi

Misollar:

1. Parabola uchining koordinatalarini toping.

$$y = 2x^2 - x - 3$$

Yechish: Parabola uchining abssissasi: $x_0 = -\frac{b}{2a} = \frac{1}{4}$

Parabola uchining ordinatasi: $y_0 = ax_0^2 + bx_0 + c = 2 \cdot \frac{1}{16} - \frac{1}{4} - 3 = -3\frac{1}{8}$

Javob: $\left(\frac{1}{4}; -3\frac{1}{8}\right)$

2. $y = (x + 4)^2 + 3$ funksiyani o'sish va kamayish oralig'ini toping.

$y = ax^2 + bx + c = a(x - x_0)^2 + y_0$ formulaga ko'ra $x_0 = -4$ va $a = 1 > 0$

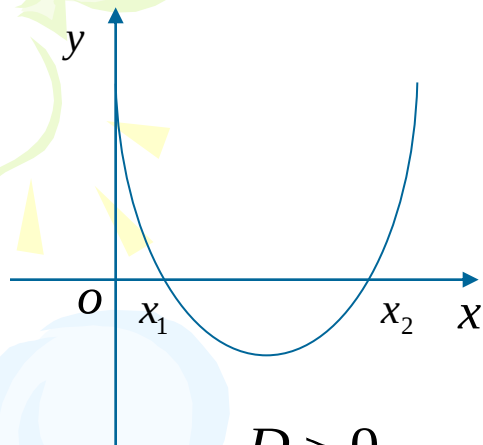
Demak, berilgan funksiya

$\leftarrow \infty; -4 \right]$ oraliqda kamayuvchi

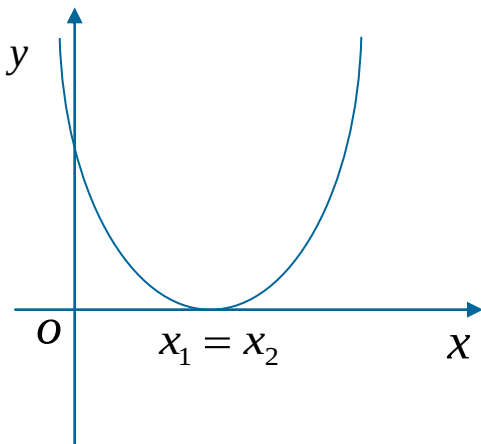
$[4; +\infty \rightarrow$ oraliqda o'suvchi

Parabolaning joylashishi:

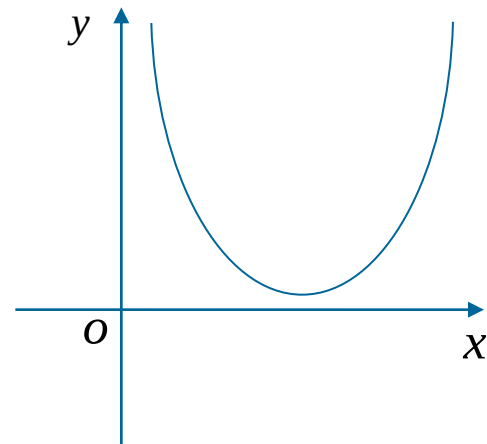
Agar $a > 0$ bo'lsa:



$$D > 0$$

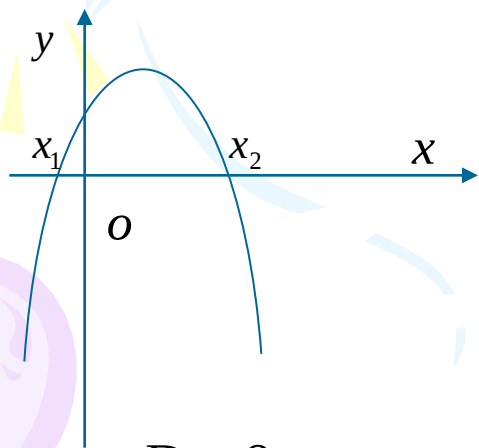


$$D = 0$$

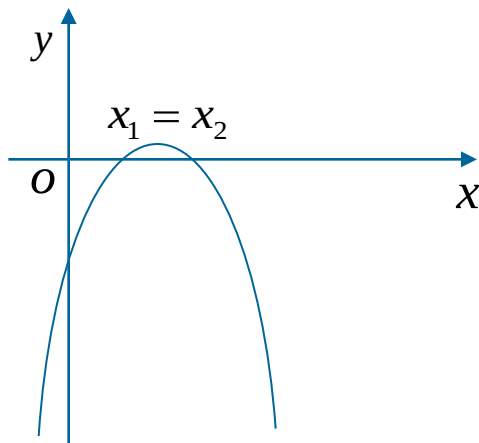


$$D < 0$$

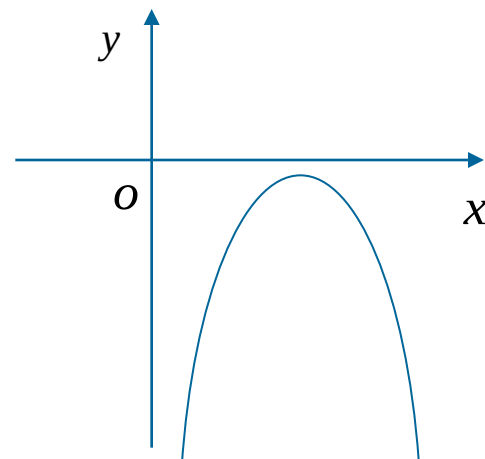
Agar $a < 0$ bo'lsa:



$$D > 0$$



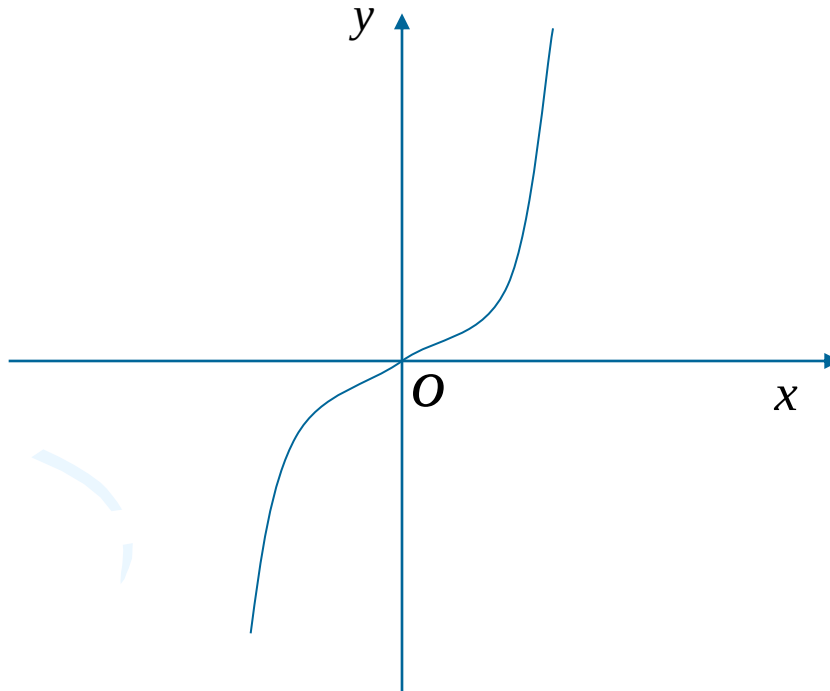
$$D = 0$$



$$D < 0$$

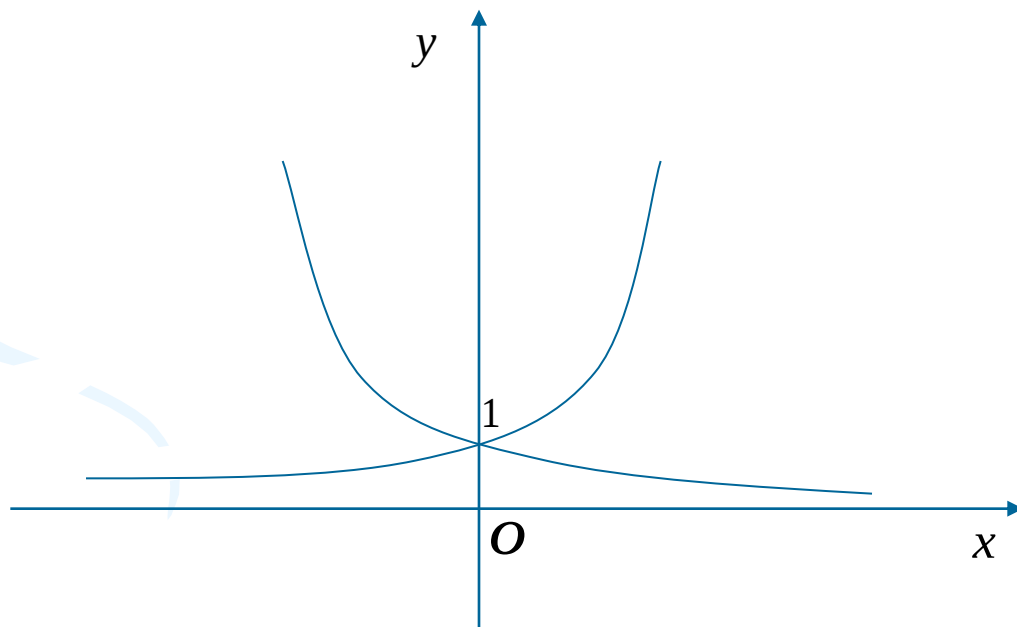
$y = x^3$ funksiya

1. Aniqlanish sohasi : $D(y) = \mathbb{R}$
2. Qiymatlar sohasi: $E(y) = \mathbb{R}$
3. $\mathbb{R}$ oraliqda o'suvchi
4. Toq funksiya.



Ko'rsatkichli funksiya : $y = a^x$ ($a > 0, a \neq 1$)

1. Aniqlanish sohasi : $D(y) = \mathbb{R}$
2. Qiymatlar sohasi: $E(y) = (0; +\infty)$
3. Grafigi $(0,1)$ nuqtadan o'tadi;
4. Assimtotasi: $y = 0$
5. $a > 1$ bo'lsa, $\mathbb{R}$ oraliqda o'suvchi
6. $0 < a < 1$ bo'lsa, $\mathbb{R}$ oraliqda kamayuvchi



Logarifmik funksiya: $y = \log_a x$ ($0 < a \neq 1$)

1. Aniqlanish sohasi : $D(y) = (0; +\infty)$
2. Qiymatlar sohasi: $E(y) = (-\infty; +\infty)$
3. Grafigi $(1,0)$ nuqtadan o'tadi;
4. Assimtotasi: $x = 0$
5. $a > 1$ bo'lsa, $(0; +\infty)$ oraliqda o'suvchi
6. $0 < a < 1$ bo'lsa, $(0; +\infty)$ oraliqda kamayuvchi

