

# Namunaviy misollar

(Parametr qatnashgan tenglama va tengsizliklar)

## 1-misol

Parametr  $a$  ning qaysi qiymatlarida tenglama **ikkita turli yechimga ega?**

$$x^2 - 2x + a = 0$$

**Yechish:**

$$D = (-2)^2 - 4a = 4 - 4a.$$

Ikki yechim uchun  $D > 0$ :

$$4 - 4a > 0 \rightarrow a < 1.$$

**Javob:**  $a < 1$

## 2-misol

Parametr  $a$  ning qaysi qiymatlarida tenglama **bitta yechimga ega?**

$$x^2 + ax + 1 = 0$$

**Yechish:**

$$D = a^2 - 4.$$

Bitta yechim uchun  $D = 0 \rightarrow a^2 = 4 \rightarrow a = \pm 2$ .

**Javob:**  $a = -2$  yoki  $a = 2$

## 3-misol

Parametr  $a$  ning qaysi qiymatlarida tenglama **yechimga ega emas?**

$$x^2 + 2ax + (a^2 + 1) = 0$$

**Yechish:**

$$D = (2a)^2 - 4(a^2 + 1) = -4 < 0.$$

Diskriminant doim manfiy.

**Javob:** barcha  $a$  uchun (yechim yo'q)

## 4-misol

Parametr  $a$  ning qaysi qiymatlarida tenglama **kamida bitta musbat yechimga ega?**

$$x^2 - ax - 1 = 0$$

**Yechish:**

$$D = a^2 + 4 > 0 \text{ — har doim ikki yechim bor.}$$

Yechimlar ko'paytmasi:  $x_1x_2 = -1 < 0$ .

Demak, ildizlardan biri musbat, biri manfiy — **har qanday  $a$**  uchun.

**Javob:** barcha  $a$  uchun

## 5-misol

Parametr  $a$  ning qaysi qiymatlarida tenglama **ikkita manfiy yechimga ega?**

$$x^2 + ax + 1 = 0$$

### Yechish:

Ikki manfiy yechim uchun shartlar:

$$D > 0, x_1 + x_2 < 0, x_1x_2 > 0.$$

Bu yerda:

$$\begin{aligned}x_1 + x_2 &= -a < 0 \rightarrow a > 0 \\x_1x_2 &= 1 > 0 \text{ — doim bajariladi} \\D &= a^2 - 4 > 0 \rightarrow |a| > 2\end{aligned}$$

Ikkalasini birlashtiramiz:  $a > 2$ .

**Javob:**  $a > 2$

## 6-misol

Parametr  $a$  ning qaysi qiymatlarida tengsizlik **barcha  $x$  lar uchun bajariladi?**

$$x^2 + (a - 2)x + 1 \geq 0$$

### Yechish:

Parabola yuqoriga ochilgan.

Barcha  $x$  lar uchun  $\geq 0$  bo'lishi uchun  $D \leq 0$ :

$$\begin{aligned}D &= (a - 2)^2 - 4 \leq 0 \\(a - 2)^2 &\leq 4 \\0 &\leq a \leq 4\end{aligned}$$

**Javob:**  $0 \leq a \leq 4$

## 7-misol

Parametr  $a$  ning qaysi qiymatlarida tenglama **aniq bitta yechimga ega?**

$$|x - a| = x - 1$$

### Yechish:

O'ng tomon  $\geq 0 \rightarrow x \geq 1$ .

Holatlar:

1.  $x \geq a$ :  $|x - a| = x - a$

$$x - a = x - 1 \rightarrow a = 1$$

Bu holda  $x \geq \max(1, a) = 1$  — barcha  $x \geq 1$  yechim bo'ladi (bitta emas).

2.  $x < a$ :  $|x - a| = a - x$

$$a - x = x - 1 \rightarrow 2x = a + 1 \rightarrow x = (a + 1)/2$$

Bu yechim  $x \geq 1$  va  $x < a$  bo'lishi kerak:

$$(a + 1)/2 \geq 1 \rightarrow a \geq 1$$

$$(a + 1)/2 < a \rightarrow a > 1$$

Demak, aniq bitta yechim faqat  $a > 1$  da.

**Javob:**  $a > 1$

### 8-misol

Parametr  $a$  ning qaysi qiymatlarida tenglama **yechimga ega?**

$$\sqrt{x - a} = 2 - x$$

**Yechish:**

Aniqlanish sohasi:  $x - a \geq 0$  va  $2 - x \geq 0 \rightarrow a \leq x \leq 2$ .

Kvadratlaymiz:

$$\begin{aligned}x - a &= (2 - x)^2 = x^2 - 4x + 4 \\x^2 - 5x + (4 + a) &= 0\end{aligned}$$

Bu tenglama  $[a, 2]$  oraliqda kamida bitta ildizga ega bo'lishi kerak.

Tekshiruv natijasida shart:  $a \leq 1$ .

**Javob:**  $a \leq 1$

### 9-misol

Parametr  $a$  ning qaysi qiymatlarida tengsizlik **kamida bitta yechimga ega?**

$$x^2 - 2ax + a^2 - 3 < 0$$

**Yechish:**

Parabola yuqoriga ochilgan.

Kamida bitta yechim bo'lishi uchun  $D > 0$ :

$$D = (-2a)^2 - 4(a^2 - 3) = 12 > 0$$

Doim musbat.

**Javob:** barcha  $a$  uchun

### 10-misol

Parametr  $a$  ning qaysi qiymatlarida tenglama **ikki xil yechimga ega?**

$$|x| = ax + 1$$

**Yechish:**

Holatlar:

- $x \geq 0: x = ax + 1 \rightarrow (1 - a)x = 1$   
 $x = 1/(1 - a), x \geq 0 \rightarrow a < 1$
- $x < 0: -x = ax + 1 \rightarrow (a + 1)x = -1$   
 $x = -1/(a + 1), x < 0 \rightarrow a > -1$

Ikkala holatda bittadan yechim bo'lishi uchun:

$$a < 1 \text{ va } a > -1 \rightarrow -1 < a < 1.$$

**Javob:**  $-1 < a < 1$