

## Namunaviy misollar

(Ko'rsatkichli tenglama va tengsizliklar)

### 1-misol

Tenglamani yeching:

$$2^x = 4^{x-1}$$

**Yechish:**

$4 = 2^2$ , shuning uchun:

$$2^x = (2^2)^{x-1} = 2^{2x-2}$$

Asoslar teng ( $2 > 1$ ), demak:

$$x = 2x - 2$$

$$x = 2$$

**Javob:**  $x = 2$

### 2-misol

Tenglamani yeching:

$$3^{x+1} + 3^x = 36$$

**Yechish:**

$3^{x+1} = 3 \cdot 3^x$ , demak:

$$3 \cdot 3^x + 3^x = 36$$

$$4 \cdot 3^x = 36$$

$$3^x = 9 = 3^2$$

$$x = 2$$

**Javob:**  $x = 2$

### 3-misol

Tenglamani yeching:

$$5^{2x-1} = 25$$

**Yechish:**

$25 = 5^2$ , demak:

$$5^{2x-1} = 5^2$$

$$2x - 1 = 2$$

$$2x = 3$$

$$x = 3/2$$

**Javob:**  $x = 3/2$

#### 4-misol

**Tenglamani yeching:**

$$2^x + 2^{x+1} = 12$$

**Yechish:**

$2^{x+1} = 2 \cdot 2^x$ , shuning uchun:

$$2^x + 2 \cdot 2^x = 12$$

$$3 \cdot 2^x = 12$$

$$2^x = 4 = 2^2$$

$$x = 2$$

**Javob:**  $x = 2$

#### 5-misol

**Tenglamani yeching:**

$$3^x + 3^{-x} = 10/3$$

**Yechish:**

$t = 3^x$  ( $t > 0$ ) deb olamiz. U holda  $3^{-x} = 1/t$ .

$$t + 1/t = 10/3$$

$$3t^2 - 10t + 3 = 0$$

$$D = 100 - 36 = 64$$

$$t = (10 \pm 8)/6$$

$$t_1 = 3, t_2 = 1/3$$

Agar  $3^x = 3$  bo'lsa,  $x = 1$ .

Agar  $3^x = 1/3$  bo'lsa,  $x = -1$ .

**Javob:**  $x = -1, 1$

#### 6-misol

**Tengsizlikni yeching:**

$$4^x \geq 2^{x+1}$$

**Yechish:**

$4 = 2^2$ , demak:

$$(2^2)^x \geq 2^{x+1}$$

$$2^{2x} \geq 2^{x+1}$$

Asos  $2 > 1$ , shuning uchun:

$$\begin{aligned}2x &\geq x + 1 \\ x &\geq 1\end{aligned}$$

**Javob:**  $x \geq 1$

### 7-misol

**Tengsizlikni yeching:**

$$(1/2)^{x-1} > (1/2)^3$$

**Yechish:**

$0 < 1/2 < 1$ , funksiya kamayuvchi, shuning uchun:

$$\begin{aligned}x - 1 &< 3 \\ x &< 4\end{aligned}$$

**Javob:**  $x < 4$

### 8-misol

**Tenglamani yeching:**

$$9^x - 3^x = 0$$

**Yechish:**

$9 = 3^2$ , shuning uchun:

$$\begin{aligned}(3^2)^x - 3^x &= 0 \\ 3^{2x} - 3^x &= 0 \\ 3^x(3^x - 1) &= 0\end{aligned}$$

$3^x > 0$ , demak:

$$\begin{aligned}3^x - 1 &= 0 \\ 3^x &= 1 \\ x &= 0\end{aligned}$$

**Javob:**  $x = 0$

### 9-misol

**Tenglamani yeching:**

$$2^{2x} - 5 \cdot 2^x + 4 = 0$$

**Yechish:**

$t = 2^x$  ( $t > 0$ ) deb olamiz. U holda  $2^{2x} = t^2$ .

$$\begin{aligned}t^2 - 5t + 4 &= 0 \\ (t - 1)(t - 4) &= 0\end{aligned}$$

$t = 1$  yoki  $t = 4$

Agar  $2^x = 1$  bo'lsa,  $x = 0$ .

Agar  $2^x = 4 = 2^2$  bo'lsa,  $x = 2$ .

**Javob:**  $x = 0, 2$

### 10-misol

**Tengsizlikni yeching:**

$$3^{x+2} \leq 9^x$$

**Yechish:**

$9 = 3^2$ , shuning uchun:

$$3^{x+2} \leq (3^2)^x = 3^{2x}$$

Asos  $3 > 1$ , demak:

$$x + 2 \leq 2x$$

$$x \geq 2$$

**Javob:**  $x \geq 2$