

Masalalar yechimlari

1-masala yechimi

$$2^{x+2} = 8 \cdot 4^{x-1}$$

$8 = 2^3$, $4 = 2^2$, demak:

$$2^{x+2} = 2^3 \cdot (2^2)^{x-1} = 2^3 \cdot 2^{2x-2} = 2^{2x+1}$$

Asoslar teng ($2 > 1$), shuning uchun:

$$x + 2 = 2x + 1$$

$$x = 1$$

Javob: $x = 1$

2-masala yechimi

$$3^{2x} - 4 \cdot 3^x + 3 = 0$$

$t = 3^x$ ($t > 0$) deb olamiz.

$$t^2 - 4t + 3 = 0$$

$$(t - 1)(t - 3) = 0$$

$t = 1$ yoki $t = 3$

$$3^x = 1 \rightarrow x = 0$$

$$3^x = 3 \rightarrow x = 1$$

Javob: $x = 0, 1$

3-masala yechimi

$$5^{x-1} \geq 25$$

$25 = 5^2$, asos $5 > 1$, demak:

$$x - 1 \geq 2$$

$$x \geq 3$$

Javob: $x \geq 3$

4-masala yechimi

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

Bu yerda $0 < 1/3 < 1$, funksiya kamayuvchi, shuning uchun:

$$x + 1 > 2x - 3$$

$$4 > x$$

Javob: $x < 4$

5-masala yechimi

$$4^x + 4^{-x} = 5/2$$

$t = 4^x$ ($t > 0$) deb olamiz, $4^{-x} = 1/t$.

$$t + 1/t = 5/2$$

$$2t^2 - 5t + 2 = 0$$

$$D = 25 - 16 = 9$$

$$t = (5 + 3)/4 = 2$$

$$t = (5 - 3)/4 = 1/2$$

$$4^x = 2 = 2^1, 4 = 2^2 \rightarrow 2^{2x} = 2^1 \rightarrow 2x = 1 \rightarrow x = 1/2$$

$$4^x = 1/2 = 2^{-1} \rightarrow 2^{2x} = 2^{-1} \rightarrow 2x = -1 \rightarrow x = -1/2$$

Javob: $x = -1/2, 1/2$