



Ex:1

$$3^{\frac{x}{2}} \cdot 5^{\frac{x}{2}} = 225$$

$$(3 \cdot 5)^{\frac{x}{2}} = 15^2$$

$$15^{\frac{x}{2}} = 15^2$$

$$\frac{x}{2} = 2$$

$$x = 4$$



Ex:2

$$5^x = \frac{1}{\sqrt[3]{25}}$$

$$5^x = \frac{1}{5^{\frac{2}{3}}}$$

$$5^x = 5^{-\frac{2}{3}}$$

$$x = -\frac{2}{3}$$

$$\sqrt[n]{a^m} = a^{\frac{m}{n}}$$

$$a^{-n} = \frac{1}{a^n}$$



Ex:3

$$3 \cdot 16^x + 37 \cdot 36^x = 26 \cdot 81^x$$

$$3 \cdot \left(\frac{16}{81}\right)^x + 37 \cdot \left(\frac{36}{81}\right)^x = 26$$

$$3 \cdot \left(\frac{4}{9}\right)^{2x} + 37 \cdot \left(\frac{4}{9}\right)^x = 26$$

$$\text{fie: } \left(\frac{4}{9}\right)^x = t > 0$$

$$3t^2 + 37t - 26 = 0$$

$$\Delta = 37^2 + 12 \cdot 16 = 1369 + 312 = 1681$$

$$t_{1,2} = \frac{-37 \pm 41}{6}$$

$$t_1 = \frac{2}{3}$$

$$t_2 = -\frac{78}{6} = -13 \quad \text{nu este soluție}$$

$$\left(\frac{4}{9}\right)^x = \frac{2}{3}$$

$$\left(\frac{2}{3}\right)^{2x} = \left(\frac{2}{3}\right)^1$$

$$2x = 1$$

$$x = \frac{1}{2}$$



Ex:4

$$9(9^x + 9^{-x}) - 3(3^x + 3^{-x}) - 72 = 0$$

$$9\left(3^{2x} + \frac{1}{3^{2x}}\right) - 3\left(3^x + \frac{1}{3^x}\right) - 72 = 0$$

$$\text{fie: } 3^x + \frac{1}{3^x} = t \Rightarrow 3^{2x} + \frac{1}{3^{2x}} = t^2 - 2$$

$$9(t^2 - 2) - 3t - 72 = 0$$

$$9t^2 - 18 - 3t - 72 = 0$$

$$9t^2 - 3t - 90 = 0$$

$$3t^2 - t - 30 = 0$$

$$\Delta = 1 + 360 = 361$$

$$t_{1,2} = \frac{1 \pm 19}{6}$$

$$t_1 = \frac{20}{6} = \frac{10}{3}$$

$$t_2 = -3 \text{ nu este soluție}$$

$$3^x + \frac{1}{3^x} = \frac{10}{3}$$

$$3 \cdot 3^{2x} - 10 \cdot 3^x + 3 = 0$$

$$\Delta = 100 - 36 = 64$$

$$3^x = \frac{10 \pm 8}{6}$$

$$3^x = 3^1$$

$$x = 1$$

$$3^x = \frac{1}{3}$$

$$3^x = 3^{-1}$$

$$x = -1$$