# ECUAȚII EXPONENȚIALE CE SE REZOLVĂ PRIN NOTAȚII

Rezolvați:

1) $1+5^x-2\cdot 25^x=0$

2) $2^{2x}-6\cdot 2^x+8=0$

3) $\left(\frac{1}{16}\right)^x+15\cdot\left(\frac{1}{4}\right)^x-16=0$

4) $9^x-3^{x+1}+2=0$

5) $9^x-3^x-6=0$

6) $20\cdot 25^x-5^x-1=0$

7) $4^x+2^x=4$

8) $12\cdot 4^x+7\cdot 2^x-12=0$

9) $16^x-5\cdot 4^x+4=0$

10) $49^x-2\cdot 7^x+1=0$

11) $2\cdot 3^x+3^{1-x}=7$

12) $8^x+4\cdot 4^x-20\cdot 2^x-48=0$

Prof. Ovidiu Bădescu

Rezolvați:

$$1+5^x-2\cdot 25^x=0$$

---

E1) not $5^x=t>0 \Rightarrow 25^x=t^2 \Rightarrow$ ec. devine

$$1+t-2t^2=0 \mid \cdot(-1) \Rightarrow 2t^2-t-1=0$$

E2) $t_{1,2}=\frac{1\pm\sqrt{1+4\cdot 2}}{2\cdot 2}=\frac{1\pm 3}{4}<\begin{matrix}1\\ -\frac{1}{2}\end{matrix}$

E3) $t_1=1 \Rightarrow 5^x=1 \Rightarrow 5^x=5^0 \Rightarrow x=0$
cum $5^x$ inj

$t_2=-\frac{1}{2} \Rightarrow 5^x=-\frac{1}{2} \Rightarrow x\in\emptyset$

Prof. Ovidiu Badescu

Rezolvați: $2^{2x} - 6 \cdot 2^x + 8 = 0$

---

$E_1$) not $2^x = t > 0 \Rightarrow 2^{2x} = t^2$

$E_2$) ec.: $t^2 - 6t + 8 = 0$

$$t_{1,2} = \frac{6 \pm \sqrt{36-32}}{2 \cdot 1} = \frac{6 \pm 2}{2} \begin{matrix} \nearrow 4 \\ \searrow 2 \end{matrix}$$

$E_3$) $t_1 = 4 \Rightarrow 2^x = 4 \Rightarrow 2^x = 2^2 \Rightarrow x = 2$
$f(x) = 2^x$ inj

$t_2 = 2 \Rightarrow 2^x = 2 \Rightarrow 2^x = 2^1 \Rightarrow x = 1$
$f(x) = 2^x$ inj

$E_4$) $S_f : x \in \{1, 2\}$

Prof. Ovidiu Badescu

Rezolvați în $\mathbb{R}$ ecuația:

$$2 \cdot 3^x + 3^{1-x} = 7$$

---

E1) $2 \cdot 3^x + \frac{3^1}{3^x} = 7$

E2) notăm $3^x = t \Rightarrow 2t + \frac{3}{t} = 7 \mid \cdot t$

$$2t^2 + 3 = 7t \Rightarrow 2t^2 - 7t + 3 = 0$$

E3) $t_{1,2} = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{7 \pm \sqrt{49 - 4 \cdot 2 \cdot 3}}{4} = \frac{7 \pm 5}{4}$

$$\begin{cases} t_1 = 3 \\ t_2 = \frac{1}{2} \end{cases}$$

E4) Caz I: $t_1 = 3 \Rightarrow 3^x = 3 \Rightarrow x = 1$

Caz II: $t_2 = \frac{1}{2} \Rightarrow 3^x = \frac{1}{2} \mid \log_3(\dots)$

$$\log_3 3^x = \log_3 \frac{1}{2} \Rightarrow x \log_3 3 = \log_3 \frac{1}{2}$$

$$\Rightarrow x = \log_3 \frac{1}{2} = \frac{\lg \frac{1}{2}}{\lg 3}$$

E5) $S_f : x \in \{1; \log_3 \frac{1}{2}\}$

Prof Ovidiu Bădescu

Rezolvați $8^x + 4 \cdot 4^x - 20 \cdot 2^x - 48 = 0$ (12)

---

$E_1)$ $(2^x)^3 + 4 \cdot (2^x)^2 - 20 \cdot 2^x - 48 = 0$

$E_2)$ notăm $2^x = t \Rightarrow t^3 + 4t^2 - 20t - 48 = 0$

$E_3)$

| | $t^3$ | $t^2$ | $t$ | $t^0$ |
|---|---|---|---|---|
| | 1 | 4 | −20 | −48 |
| 1 | 1 | 5 | −15 | −63 ≠ 0 |
| 2 | 1 | 6 | −8 | −64 ≠ 0 |
| 4 | 1 | 8 | 12 | 0 |

$E_4)$ $(t-4)(t^2 + 8t + 12) = 0$

$\Rightarrow \begin{cases} t - 4 = 0 \Rightarrow t_1 = 4 \\ t^2 + 8t + 12 = 0 \end{cases}$

$t_{1,2} = \dfrac{-8 \pm \sqrt{64 - 48}}{2} \begin{cases} t_1 = -2 \\ t_2 = -6 \end{cases}$

$E_5)$ $t_1 = 4 \Rightarrow 2^x = 4 \Rightarrow x = 2$

$t_2 = -2 \Rightarrow 2^x = -2$ fals

$t_3 = -6 \Rightarrow 2^x = -6$ fals

Prof. Ovidiu Pădesu