

Exponenciální rovnice řešené substitucí

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

$$\frac{3^{2x}}{3} + 3^x - 1 = \frac{1}{3} \quad / *3$$

$$3^{2x} + 3 * 3^x - 3 = 1$$

$$3^x = t$$

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

$$t_1 = -4 \quad t_2 = 1$$

$$3^x = -4 \quad \Rightarrow P = \emptyset$$

$$3^x = 1 \quad \Rightarrow 3^x = 3^0 \quad \Rightarrow x = 0$$

$$\text{NSolve}[3^{2x-1} + 3^x - 3^0 == 3^{-1}, x]$$

$$\{x \rightarrow 0.\}$$

$$25^{2x} - 3 * 25^x = 10$$

$$25^{2x} - 3 * 25^x = 10$$

$$25^x = t$$

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

$$t_1 = 5 \quad t_2 = -2$$

$$25^x = 5 \Rightarrow 5^{2x} = 5 \Rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}$$

$$25^x = -2 \Rightarrow P = \emptyset$$

$$\text{NSolve}[25^{2x} - 3 * 25^x == 10, x]$$

$$\{x \rightarrow 0.5\}$$

Řešte v \mathbb{R} , zkoušku proveďte v programu Math.

a) $4^x - 10 * 2^{x-1} = 24$

b) $\sqrt[x]{81} + \frac{27}{\sqrt[x]{81}} = 12$

c) $9^{\sqrt{x+2}} = 27 * 3^{\sqrt{x+2}}$

Výsledky:

a) $\text{NSolve}[2^{2x} - 10 * 2^{x-1} == 24, x]$ $\{x \rightarrow 3.\}$

b) $\text{NSolve}\left[\sqrt[x]{81} + \frac{27}{\sqrt[x]{81}} == 12, x\right]$ $\{x \rightarrow 2.\}, \{x \rightarrow 4.\}$

c) $\text{NSolve}[9^{\sqrt{x+2}} == 27 * 3^{\sqrt{x+2}}, x]$ $\{\{x \rightarrow 7.\}\}$

Různé úlohy:

$$2^{3x-1} * 4 = 8^{x+1} * 0.5^x$$

{(x → 2.)}

$$\frac{81}{16} = \left(\frac{2}{3}\right)^x * \left(\frac{9}{4}\right)^{x+1}$$

{(x → 2.)}

$$3^x + 3^{x+1} = 108$$

{(x → 3.)}

$$6 * 7^{x+3} - 7^{x+2} = 41$$

{(x → -2.)}

$$9 * 3^x + 3^{-x} = 10$$

{(x → -2.), (x → 0.)}

$$16^x = 8 * 4^x + 2 * 8^x$$

{(x → 2.)}

$$2^{x-1} - 2^{x-2} = 5^{x-3} + 2^{x-3}$$

{(x → 3.)}

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

{(x → -1.), (x → 0.63093)}

$$2^x * 3^{x-1} = 12$$

{(x → 2.)}