

S 79 Nr. 3

$$\begin{aligned} a) \quad (7^{2x-1})^2 = 36 &\Rightarrow 7^{4x-2} = 36 \Rightarrow (4x-2) \log(7) = \log(36) \\ &\Rightarrow 4x-2 = \frac{\log(36)}{\log(7)} \Rightarrow 4x = \frac{\log(36)}{\log(7)} + 2 \Rightarrow x = \frac{\log(36)}{4 \log(7)} + \frac{2}{4} \end{aligned}$$

$$x \approx 0,960$$

oder

$$\begin{aligned} \sqrt{(7^{2x-1})^2} = \sqrt{36} &\Rightarrow 7^{2x-1} = 6 \Rightarrow (2x-1) \cdot \log(7) = \log(6) \\ \Rightarrow 2x-1 = \frac{\log(6)}{\log(7)} &\Rightarrow 2x = \frac{\log(6)}{\log(7)} + 1 \Rightarrow x = \frac{\log(6)}{2 \log(7)} + \frac{1}{2} \approx 0,960 \end{aligned}$$

oder

$$\begin{aligned} (7^{2x-1})^2 = 7^{4x-2} = 7^{4x} \cdot \frac{1}{7^2} = 36 &\Rightarrow 7^{4x} = 36 \cdot 7^2 \\ \Rightarrow 4x \log(7) = \log(36 \cdot 7^2) &\Rightarrow 4x = \frac{\log(36 \cdot 7^2)}{\log(7)} \Rightarrow x = \frac{\log(36 \cdot 7^2)}{4 \cdot \log(7)} \end{aligned}$$

$$x \approx 0,960$$

$$\begin{aligned} b) \quad 5 \cdot 2^{-3x+4} = 1 &\Rightarrow 2^{-3x+4} = \frac{1}{5} \Rightarrow (-3x+4) \log(2) = \log\left(\frac{1}{5}\right) \\ \Rightarrow -3x+4 = \frac{\log\left(\frac{1}{5}\right)}{\log(2)} &\Rightarrow -3x = \frac{\log\left(\frac{1}{5}\right)}{\log(2)} - 4 \Rightarrow x = \frac{\log\left(\frac{1}{5}\right)}{-3 \cdot \log(2)} + \frac{4}{3} \end{aligned}$$

$$x \approx 2,107$$

$$\begin{aligned} c) \quad 4 - 2^x = 4100 - 5 \cdot 2^x &\Rightarrow 4 - 2^x + 5 \cdot 2^x = 4100 \Rightarrow 4 \cdot 2^x = 4096 \\ \Rightarrow 2^x = \frac{4096}{4} &\Rightarrow x \log(2) = \log\left(\frac{4096}{4}\right) \Rightarrow x = \frac{\log\left(\frac{4096}{4}\right)}{\log(2)} = 10 \end{aligned}$$

$$\begin{aligned} d) \quad 2 \cdot 4^x + 3044 = 14 \cdot 4^x - 28 &\Rightarrow 3044 + 28 = 14 \cdot 4^x - 2 \cdot 4^x \\ \Rightarrow 3072 = 14 \cdot 4^x - 2 \cdot 4^x &\Rightarrow 3072 = 12 \cdot 4^x \Rightarrow 4^x = \frac{3072}{12} \end{aligned}$$

$$\Rightarrow x \cdot \log(4) = \log\left(\frac{3072}{12}\right) \Rightarrow x = \frac{\log\left(\frac{3072}{12}\right)}{\log(4)} = 4$$