

# Hastvány-gyök

$$\begin{aligned} \textcircled{1} \quad a) \quad \left(\frac{4}{9}\right)^{-3} \cdot \left(\frac{3}{2}\right)^{12} : \left(\frac{6}{9}\right)^4 \cdot \left(\frac{12}{27}\right)^{-4} &= \frac{9^3}{4^3} \cdot \frac{3^{12}}{2^{12}} \cdot \frac{9^4}{6^4} \cdot \frac{27^4}{12^4} = \\ &= \frac{(3^2)^3}{(2^2)^3} \cdot \frac{3^{12}}{2^{12}} \cdot \frac{(3^2)^4}{2^4 \cdot 3^4} \cdot \frac{(3^3)^4}{2^4 \cdot 2^4 \cdot 3^4} = \frac{3^6 \cdot 3^{12} \cdot 3^8 \cdot 3^{12}}{2^6 \cdot 2^{12} \cdot 2^4 \cdot 3^4 \cdot 2^8 \cdot 3^4} = \\ &= \frac{3^{6+12+8+12}}{2^{6+12+4+8} \cdot 3^{4+4}} = \frac{3^{38}}{2^{30} \cdot 3^8} = \frac{3^{30}}{2^{30}} = \left(\frac{3}{2}\right)^{30} \end{aligned}$$

$$\begin{aligned} b) \quad (\sqrt{18} + \sqrt{50} + 9\sqrt{2}) \cdot \sqrt{2} &= \sqrt{18} \cdot \sqrt{2} + \sqrt{50} \cdot \sqrt{2} + 9\sqrt{2} \cdot \sqrt{2} = \\ &= \sqrt{36} + \sqrt{100} + 9\sqrt{4} = 6 + 10 + 9 \cdot 2 = 34 \end{aligned}$$

$$c) \quad (3a^{-3} \cdot b^4 \cdot a^5 \cdot b^{-8}) / (a^2 \cdot b^{-4}) = \frac{3 \cdot a^2 \cdot b^{-4}}{a^2 \cdot b^{-4}} = 3$$

$$\begin{aligned} \textcircled{2} \quad \begin{array}{l} \text{a} \\ \text{b} \end{array} \quad \begin{array}{l} a = 5 \cdot 10^{-14} \\ b = 4 \cdot 10^{-12} \end{array} \quad \begin{aligned} T &= a \cdot b = 5 \cdot 10^{-14} \cdot 4 \cdot 10^{-12} = 20 \cdot 10^{-26} \text{ cm}^2 \\ K &= 2a + 2b = 2 \cdot 5 \cdot 10^{-14} + 2 \cdot 4 \cdot 10^{-12} = \\ &= 10 \cdot 10^{-14} + 8 \cdot 10^{-12} = 10 \cdot 10^{-2} \cdot 10^{-12} + 8 \cdot 10^{-12} = \\ &= 0,1 \cdot 10^{-12} + 8 \cdot 10^{-12} = 8,1 \cdot 10^{-12} \text{ cm} \end{aligned} \end{aligned}$$

$$\textcircled{3} \quad \sqrt{(9 - \sqrt{25}) \cdot (9 + \sqrt{25})} =$$

felhasználjuk ismeret:  $(a+b)(a-b) = a^2 - b^2$

$$= \sqrt{9^2 - (\sqrt{25})^2} = \sqrt{81 - 25} = \sqrt{56}$$

$$\textcircled{4} \quad 25^2 \cdot (5^{-2})^3 : 125^{-2} = (5^2)^2 \cdot (5^{-2})^3 \cdot \frac{1}{(5^3)^{-2}} = 5^4 \cdot 5^{-6} \cdot 5^6 = 5^4$$