

16. Stepen sa racionalnim izložiocem – vežbe

ZADATAK 1. Izračunaj $\left(\frac{36}{169}\right)^{\frac{3}{10}} : \left(\frac{13}{6}\right)^{\frac{2}{3}}$.

Rešenje:

$$\left(\frac{36}{169}\right)^{\frac{3}{10}} : \left(\frac{13}{6}\right)^{\frac{2}{3}} = \left(\frac{169}{36}\right)^{\frac{3}{10}} : \left(\frac{13}{6}\right)^{\frac{2}{3}} = \left(\left(\frac{13}{6}\right)^2\right)^{\frac{3}{10}} : \left(\frac{13}{6}\right)^{\frac{2}{3}} = \left(\frac{13}{6}\right)^{\frac{6 \cdot 2}{10 \cdot 3}} = \left(\frac{13}{6}\right)^{\frac{1}{5}} = \sqrt[5]{\frac{6}{13}}$$

ZADATAK 2. Uporedi $9^{\frac{1}{2}}$ i $25^{\frac{1}{3}}$.

Rešenje:

Pošto važi:

$$9^{\frac{1}{2}} = 9^{\frac{3}{6}} = (9^3)^{\frac{1}{6}} = 729^{\frac{1}{6}} \quad \text{i}$$

$$25^{\frac{1}{3}} = 25^{\frac{2}{6}} = (25^2)^{\frac{1}{6}} = 625^{\frac{1}{6}},$$

onda zaključujemo da je

$$9^{\frac{1}{2}} = 729^{\frac{1}{6}} > 625^{\frac{1}{6}} = 25^{\frac{1}{3}}.$$

ZADATAK 3. Odredi vrednost izraza $0,125^{-\frac{2}{3}}$.

Rešenje:

$$0,125^{-\frac{2}{3}} = \left(\frac{1}{8}\right)^{-\frac{2}{3}} = 8^{\frac{2}{3}} = \left(8^{\frac{1}{3}}\right)^2 = 2^2 = 4.$$

· **(Lagranžov identitet)** Ako je $a \geq 0, b \geq 0$ i $a^2 - b^2 \geq 0$, onda važi

$$\sqrt{a \pm \sqrt{b}} = \sqrt{\frac{a + \sqrt{a^2 - b}}{2}} \pm \sqrt{\frac{a - \sqrt{a^2 - b}}{2}}.$$

ZADATAK 4. Izračunaj $\sqrt{6-4\sqrt{2}}$.

Rešenje:

$$\begin{aligned}\sqrt{6-4\sqrt{2}} &= \sqrt{6-\sqrt{16}\cdot 2} = \sqrt{6-\sqrt{32}} = \sqrt{\frac{6+\sqrt{6^2-32}}{2}} + \sqrt{\frac{6-\sqrt{6^2-32}}{2}} = \\ &= \sqrt{\frac{6+\sqrt{4}}{2}} + \sqrt{\frac{6-\sqrt{4}}{2}} = \sqrt{4} - \sqrt{2} = 2 - \sqrt{2}.\end{aligned}$$