



Koreni višjih stopenj – vaje

Naloga 1. Poenostavi spodnje izraze:

a) $\sqrt[5]{\sqrt{x^3}} \cdot \sqrt[3]{\sqrt[5]{x^4}},$

b) $\sqrt[4]{a^2b} \cdot \sqrt[3]{ab^{-2}} : \sqrt[6]{a^2b^{-3}},$

c) $\sqrt[4]{\sqrt[3]{x^2}} : \sqrt[3]{x^2\sqrt{x}},$

d) $\frac{2\sqrt{a\sqrt[3]{a^2}}}{\sqrt[4]{a}\sqrt[3]{a}},$

e) $\frac{\sqrt{xy}\sqrt[3]{y}\sqrt[4]{x^3}}{\sqrt[3]{xy^2}}.$

Naloga 2. Izračunaj vrednosti spodnjih izrazov:

a) $\sqrt[4]{a\sqrt[3]{a}} + \sqrt[3]{8a},$ ko je $a = 27,$

b) $\left(\sqrt{(\sqrt{x^{-1}} \cdot \sqrt[3]{y^2})^{-3}} : (\sqrt[3]{\sqrt{x^3}} \cdot y^{-1}) \right)^{-3},$ ko je $x = \frac{1}{16}$ in $y = 8.$

Naloga 3. Odpravi večkratne korene v spodnjih izrazih, in če je mogoče, korene med seboj seštej:

a) $\sqrt[3]{a^2 \cdot \sqrt[4]{a^2}} + \sqrt[4]{a^3 \cdot \sqrt[3]{a}} - \sqrt[6]{a^3 \cdot \sqrt{a^4}},$

b) $3\sqrt[3]{x^2 \cdot \sqrt[4]{x}} + \sqrt{x \cdot \sqrt[6]{x^3}} - 2\sqrt[6]{x^3 \cdot \sqrt{x^3}}.$

Naloga 4. Izračunaj natančno vrednost spodnjih izrazov brez uporabe kalkulatorja:

a) $\sqrt[3]{\left(\frac{8}{27}\right)^{-2}} \cdot \sqrt[2]{\left(2\frac{1}{4}\right)^{-3}} - \sqrt[4]{16^3},$

b) $(\sqrt[4]{9^{-1}} - \sqrt[3]{(2\sqrt{2})^{-1}})(\sqrt[4]{9^{-1}} + \sqrt[3]{\sqrt{8^{-1}}}).$

Naloga 5. Racionaliziraj spodnja izraza:

a) $\frac{1}{\sqrt[3]{\sqrt{3}-\sqrt{2}}},$

b) $\frac{\sqrt{2}-1}{\sqrt{2}-\sqrt[4]{2}}.$



Naloga 1. a) $\sqrt[30]{x^{17}}$ b) $\sqrt[12]{a^6b}$ c) $\sqrt[3]{\frac{1}{x^2}}$ d) $2\sqrt{a}$ e) $x\sqrt[12]{xy^4}$

Naloga 2. a) $= \sqrt[3]{a} + \sqrt[3]{8a} = 3 + 2 \cdot 3 = 9$

b) $= \left(\sqrt{\sqrt{x^3} \cdot y^{-2}} : (\sqrt{x} \cdot y^{-1}) \right)^{-3} = \left(\sqrt[4]{x^3 y^{-4}} : \sqrt{x} \cdot y^{-1} \right)^{-3} =$
 $= \left(\sqrt[4]{x^3 y^{-4}} : (x^2 y^{-4}) \right)^{-3} = (\sqrt[4]{x})^{-3} = \sqrt[4]{x^{-3}} = \sqrt[4]{\left(\frac{1}{16}\right)^{-3}} = \sqrt[4]{16^3} = 2^3 = 8$

Naloga 3. a) $\sqrt[6]{a^5}$ b) $2\sqrt[4]{x^3}$

Naloga 4. a) $= \left(\frac{3}{2}\right)^2 \cdot \left(\frac{3}{2}\right)^{-3} - 2^3 = \frac{9}{4} \cdot \frac{8}{27} - 8 = \frac{2}{3} - 8 = -7\frac{1}{3}$

b) $= \sqrt[4]{9^{-2}} - \sqrt[3]{(2\sqrt{2})^{-4}} = \sqrt[4]{3^{-4}} - \sqrt[3]{2^{-6}} = \frac{1}{3} - \frac{1}{4} = \frac{1}{12}$

Naloga 5. a) $\sqrt[3]{\sqrt{3} + \sqrt{2}}$

b) $= \frac{(\sqrt[4]{2}-1)(\sqrt[4]{2}+1)}{\sqrt[4]{2}(\sqrt[4]{2}-1)} = \frac{\sqrt[4]{8}(\sqrt[4]{2}+1)}{2}$