

## Rješenja zadatka 4.2

**Zadatak 1.** Odredi derivacije sljedećih funkcija:

$$1) f(x) = 3x^3;$$

$$2) f(x) = \frac{1}{x^4};$$

$$3) f(x) = -2x^{-2};$$

$$4) f(x) = \frac{1}{\sqrt{x}};$$

$$5) f(x) = \frac{1}{2} \cdot \sqrt[3]{x^2};$$

$$6) f(x) = \frac{1}{\sqrt[4]{x^3}}.$$

**Rješenje.**

$$1) f'(x) = (3x^3)' = 3 \cdot 3x^2 = 9x^2;$$

$$2) f'(x) = \left(\frac{1}{x^4}\right)' = (x^{-4})' = -4 \cdot x^{-4-1} = -4x^{-5} = -\frac{4}{x^5};$$

$$3) f'(x) = (-2x^{-2})' = -2 \cdot (-2x^{-2-1}) = 4x^{-3};$$

$$4) f'(x) = \left(\frac{1}{x^{\frac{1}{2}}}\right)' = (x^{-\frac{1}{2}})' = -\frac{1}{2}x^{-\frac{1}{2}-1} = -\frac{1}{2}x^{-\frac{3}{2}} = -\frac{1}{2x^{\frac{3}{2}}} = -\frac{1}{2x\sqrt{x}};$$

$$5) f'(x) = \left(\frac{1}{2}\sqrt[3]{x^2}\right)' = \left(\frac{1}{2}x^{\frac{2}{3}}\right)' = \frac{2}{3} \cdot \frac{1}{2}x^{\frac{2}{3}-1} = \frac{1}{3}x^{-\frac{1}{3}} = \frac{1}{3x^{\frac{1}{3}}} = \frac{1}{3x\sqrt[3]{x}};$$

$$6) f'(x) = \left(\frac{1}{\sqrt[4]{x^3}}\right)' = \left(\frac{1}{x^{\frac{3}{4}}}\right)' = (x^{-\frac{3}{4}})' = -\frac{3}{4} \cdot x^{-\frac{3}{4}-1} = -\frac{3}{4}x^{-\frac{7}{4}} = -\frac{3}{4x^{\frac{7}{4}}} = -\frac{3}{4x\sqrt[4]{x^3}}.$$