Zadatak 2.

1) $f(x) = \dfrac{x}{\sqrt{x}}$; **2)** $f(x) = -\sqrt{x\sqrt{x}}$;

3) $f(x) = \dfrac{\sqrt{x}}{\sqrt[3]{x}}$; **4)** $f(x) = \sqrt{x} \cdot \sqrt[3]{x}$;

5) $f(x) = \sqrt[3]{x \cdot \sqrt{x}}$.

Rješenje.

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

2) $f'(x) = (-\sqrt{x\sqrt{x}})' = (-\sqrt[4]{x^3})' = (-x^{\frac{3}{4}})' = -\dfrac{3}{4} \cdot x^{\frac{3}{4}-1} = -\dfrac{3}{4}x^{-\frac{1}{4}} = \dfrac{3}{4x^{\frac{1}{4}}} = -\dfrac{3}{4}\dfrac{3}{4 \cdot \sqrt[4]{x}}$;

3) $f'(x) = \left(\dfrac{\sqrt{x}}{\sqrt[3]{x}}\right)' = \left(\dfrac{x^{\frac{1}{2}}}{x^{\frac{1}{3}}}\right)' = (x^{\frac{1}{2}-\frac{1}{3}})' = (x^{\frac{1}{6}})' = \dfrac{1}{6} \cdot x^{\frac{1}{6}-1} = \dfrac{1}{6}x^{-\frac{5}{6}} = \dfrac{1}{6x^{\frac{5}{6}}} = \dfrac{1}{6 \cdot \sqrt[6]{x^5}}$;

4) $f'(x) = (\sqrt{x} \cdot \sqrt[3]{x})' = (x^{\frac{1}{2}} \cdot x^{\frac{1}{3}})' = (x^{\frac{5}{6}})' = \dfrac{5}{6} \cdot x^{\frac{5}{6}-1} = \dfrac{5}{6}x^{-\frac{1}{6}} = \dfrac{5}{6x^{\frac{1}{6}}} = \dfrac{5}{6 \cdot \sqrt[6]{x}}$;

5) $f'(x) = (\sqrt[6]{x^2 \cdot x})' = (\sqrt[6]{x^3})' = (x^{\frac{3}{6}})' = (x^{\frac{1}{2}})' = \dfrac{1}{2} \cdot x^{\frac{1}{2}-1} = \dfrac{1}{2}x^{-\frac{1}{2}} = \dfrac{1}{2x^{\frac{1}{2}}} = \dfrac{1}{2\sqrt{x}}$.