Rješenja zadataka 4.4

Zadatak 1. Odredi derivaciju inverzne funkcije $f^{-1}(x)$ ako je:

1) $f(x) = \frac{1}{2}x - 3$; **2)** $f(x) = -2x + 5$;

3) $f(x) = \frac{1}{1-x}$; **4)** $f(x) = \frac{1}{e^x}$.

Rješenje. **1)** $(f^{-1})'(x) = \dfrac{1}{\left[\frac{1}{2}f(x) - 3\right]'} = \dfrac{1}{\frac{1}{2}} = 2$;

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

3) $x = \dfrac{1}{1-y} \implies 1 - y = \dfrac{1}{x} \implies f^{-1}(x) = 1 - \dfrac{1}{x} \implies (f^{-1})'(x) = \dfrac{1}{x^2}$;

4) $x = \dfrac{1}{e^y} \implies e^y = \dfrac{1}{x} \implies f^{-1}(x) = \ln\dfrac{1}{x} = -\ln x \implies (f^{-1})'(x) = -\dfrac{1}{x}$.