Zadatak 25. Za dane funkcije $f(x)=\log_{\frac{1}{2}} x$ i $g(x)=\frac{2^x-2^{-x}}{2^x+2^{-x}}$ riješi nejednadžbu $(g\circ f)(x)<0.6$.

Rješenje. $f(x)=\log_{\frac{1}{2}} x,\ g(x)=\frac{2^x-2^{-x}}{2^x+2^{-x}},\ x>0$

$$(g\circ f)(x)=\frac{2^{\log_{\frac{1}{2}} x}-2^{-\log_{\frac{1}{2}} x}}{2^{\log_{\frac{1}{2}} x}+2^{-\log_{\frac{1}{2}} x}}=\frac{2^{-\log_2 x}-2^{\log_2 x}}{2^{-\log_2 x}+2^{\log_2 x}}=\frac{\frac{1}{x}-x}{\frac{1}{x}+x}$$

$$=\frac{\frac{1-x^2}{x}}{\frac{1+x^2}{x}}=\frac{1-x^2}{1+x^2},\quad 0.6=\frac{3}{5}$$

$$\frac{1-x^2}{1+x^2}<\frac{3}{5}\implies 5-5x^2<3+3x^2\implies 2<8x^2\implies x^2>\frac{1}{4}\implies |x|>\frac{1}{2}$$

$$\implies x>\frac{1}{2}.$$