Zadatak 22. Za funkcije $f(x) = 2^{-x} + 1$, $g(x) = 2x - 1$, riješi nejednadžbu $(f \circ g)(x) < (g \circ f)(x)$.

Rješenje. $f(x) = 2^{-x} + 1$, $g(x) = 2x - 1$

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

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

$$2 \cdot 2^{-2x} + 1 < 2 \cdot 2^{-x} + 1 \qquad 2^{2x} > 2^x$$

$$2 \cdot 2^{-2x} < 2 \cdot 2^{-x} \qquad 2^{2x} - 2^x > 0$$

$$2^{-2x} < 2^{-x} \qquad \underbrace{2^x}_{>0}(2^x - 1) > 0$$

$$\frac{1}{2^{2x}} < \frac{1}{2^x} \qquad 2^x > 1 \implies x > 0.$$