

Rješenja od Zadataka za vježbu pred 1. kolokvij

1. a) $x \in \{\pm 2\sqrt{2}, \pm i\}$
b) $x \in \{-3, -1, 2\}$
c) $x \in \{-2, -1, 2\}$
d) $x \in \{\pm 1\}$
e) $x \in \{-17/3, 19\}$

2. a) $x \in \langle -\infty, 0 \rangle \cup \langle 1/3, +\infty \rangle$
b) $x \in \langle -7, 1 \rangle$
c) $x \in \langle -\infty, 5/3 \rangle \cup [3, +\infty)$
d) $x \in \langle -\infty, 0 \rangle \setminus \{-1\}$
e) $x \in \mathbb{R}$

3. A : izvan kružnice,
 B : unutar elipse,
 C : unutar parabole,
 D : između 'krakova' hiperbole,
 E : ispod V-a,
 F : iznad krivulje,
i G : ispod krivulje,

5. a) $(f \circ g)(x) = 2x^2 - x + 3$, $(g \circ f)(x) = 2x^2 + 3x + 3$ te $(f \circ g)(\frac{2}{3}) = 29/9$ i $(g \circ f)(-\sqrt{2}) = 7 - 3\sqrt{2}$

b) $(f \circ g)(x) = \log^2 x - 2 \log x + 3$, $(g \circ f)(x) = \log(x^2 - 2x + 3)$ te $(f \circ g)(\frac{2}{3}) = 3.383$ i $(g \circ f)(-\sqrt{2}) = 0.894$

c) $(f \circ g)(x) = \sin(5x^2 - x + 1)$, $(g \circ f)(x) = 5 \sin^2 x - \sin x + 1$ te $(f \circ g)(\frac{2}{3}) = \sin(23/9) = 0.553$ i $(g \circ f)(-\sqrt{2}) = 6.866$

d) $(f \circ g)(x) = \frac{-x+5}{6}$, $(g \circ f)(x) = \frac{7x-5}{2x-1}$ te $(f \circ g)(\frac{2}{3}) = 13/18$ i $(g \circ f)(-\sqrt{2}) = \frac{23+3\sqrt{2}}{7}$

6. a) $D_f = \mathbb{R} \setminus \{0\}$

b) $D_f = \langle -\infty, -2 \rangle \cup [1, 2)$

c) $D_f = \langle -\infty, 5/3 \rangle \setminus \{4/3\}$

d) $D_f = \langle -\infty, 3/5]$

e) $D_f = \emptyset$

f) $D_f = \mathbb{R} \setminus \{0\}$

g) $D_f = [1, 2) \setminus \{3/2\}$

e) $D_f = [-2, 4]$

7. a) $f^{-1}(x) = -\frac{x^2}{2} + 3$

b) $f^{-1}(x) = \frac{x}{1-x}$

c) $f^{-1}(x) = \frac{2-x}{3}$

d) $f^{-1}(x) = \frac{3x+1}{1-2x}$

8. a) $D_f = \mathbb{R} \setminus \{x \in \mathbb{R} : x \neq \frac{\pi}{2} + 2k\pi, k \in \mathbb{Z}\}, f^{-1}(x) = \arcsin\left(\frac{2-x}{x-1}\right)$ i $D_{f^{-1}} = [3/2, +\infty)$

b) $D_f = \mathbb{R}, f^{-1}(x) = -\ln(5+x) + 3$ i $D_{f^{-1}} = \langle -5, \infty)$

c) $D_f = \langle -\infty, 1), f^{-1}(x) = -10^{\frac{x-3}{2}} + 1$ i $D_{f^{-1}} = \mathbb{R}$

d) $D_f = \langle 0, \infty), f^{-1}(x) = \frac{\sin(e^x)}{1 - \sin(e^x)}$ i $D_{f^{-1}} = \mathbb{R} \setminus \{x \in \mathbb{R} : x \neq \ln(\frac{\pi}{2} + 2k\pi), k \in \mathbb{Z}\}$

e) $D_f = \langle -\infty, -1 \rangle \cup \langle 0, \infty), f^{-1}(x) = \sqrt{x^2 + \frac{1}{4}} - \frac{1}{2}$ i $D_{f^{-1}} = \mathbb{R}$