Zadatak 2. Koje su od sljedećih funkcija ograničene na području definicije:

1) $f(x) = \dfrac{1}{1+x^2}$;

2) $f(x) = \dfrac{x^3}{1+x^2}$;

3) $f(x) = \dfrac{x^2}{1+x^2}$;

4) $f(x) = \dfrac{1}{x^2+6x+8}$;

5) $f(x) = \dfrac{1}{x^2+6x+10}$;

6) $f(x) = 2^{-x^2}$?

Rješenje. **1)** $f(x) = \dfrac{1}{1+x^2}$

$\Longrightarrow f : \mathbf{R} \to \langle 0, 1] \Longrightarrow 0 < f(x) \leqslant 1, \forall x \in \mathbf{R} \Longrightarrow$ ograničena;

2) $f(x) = \dfrac{x^3}{1+x^2}$

$\Longrightarrow f : \mathbf{R} \to \mathbf{R} \Longrightarrow$ neograničena;

3) $f(x) = \dfrac{x^2}{1+x^2}$

$f : \mathbf{R} \to \langle 0, 1\rangle \Longrightarrow 0 < f(x) < 1, \forall x \in \mathbf{R} \Longrightarrow$ ograničena;

4) $f(x) = \dfrac{1}{x^2+6x+8} = \dfrac{1}{(x+2)(x+4)}$, $x^2+6x+8 = (x+3)^2 - 1$

$f : \mathbf{R} \setminus \{-2, -4\} \to [-1, +\infty\rangle \Longrightarrow$ neograničena;

5) $f(x) = \dfrac{1}{x^2+6x+10} = \dfrac{1}{(x+3)^2+1}$

$f : \mathbf{R} \to \langle 0, 1] \Longrightarrow 0 < f(x) \leqslant 1 \Longrightarrow$ ograničena;

6) $f(x) = 2^{-x^2}$

$f : \mathbf{R} \to \langle 0, 1] \Longrightarrow 0 < f(x) \leqslant 1 \Longrightarrow$ ograničena.