

8. minitest, 011, 25.11.2025

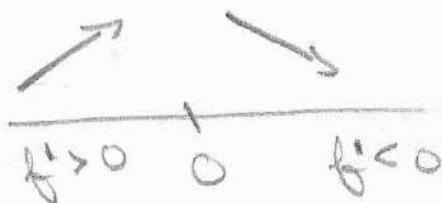
Vyšetřete průběh funkce  $f(x) = \frac{1}{x^2+1}$

$$\forall x \in \mathbb{R}: x^2+1 \neq 0 \Rightarrow D_f = \mathbb{R}$$

$$\lim_{x \rightarrow \pm\infty} \frac{1}{x^2+1} = 0$$

$$f'(x) = 2x \cdot (-1) \cdot (x^2+1)^{-2} = -\frac{2x}{(x^2+1)^2}$$

$$f'(x) = 0 \iff x = 0$$



$f(0) = 1 \Rightarrow$  globální maximum je  $[0, 1]$

$$f''(x) = -\frac{2 \cdot (x^2+1)^2 - 2x \cdot 2x \cdot 2(x^2+1)^1}{(x^2+1)^4} =$$

DERIVACE  
PODÍLU

$$\left(\frac{u}{v}\right)' = \frac{u' \cdot v - u \cdot v'}{v^2}$$

$$= -\frac{(x^2+1) \cdot 2 \cdot (x^2+1 - 4x^2)}{(x^2+1)^4 \cdot 3} =$$

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

$$f''(x) = 0 \iff 1 - 3x^2 = 0$$

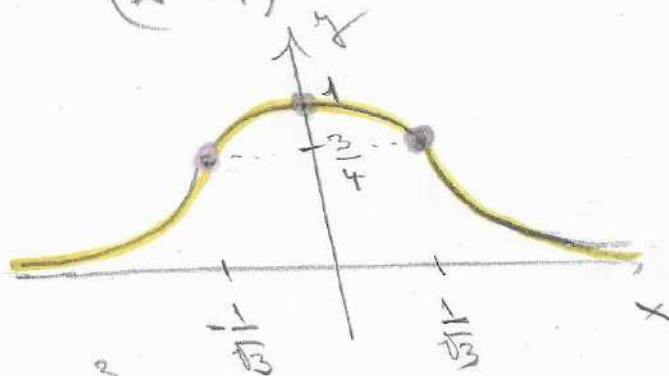
$$x^2 = \frac{1}{3}$$

$$x = \pm \frac{1}{\sqrt{3}}$$



$$f'' > 0 \quad \frac{1}{\sqrt{3}} \quad f'' < 0 \quad \frac{1}{\sqrt{3}} \quad f'' > 0$$

$$f\left(\pm \frac{1}{\sqrt{3}}\right) = \frac{1}{\frac{1}{3}+1} = \frac{3}{4}$$



$$H = (0, 1)$$