ŠTVRTOK 14:00 - 15:50
K. LACKOVÁ SK. 1

Zadanie 1

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1.

$$f(x) = 5 \cdot \operatorname{arctg}(x) \cdot \left(\frac{x-a}{x-a} + \frac{x-b}{x-b} + \frac{x-c}{x-c} + \frac{x-d}{x-d} \right)$$

$D(f) = R - \{a, b, c, d\}$ $\quad x-a \neq 0 \Rightarrow x \neq a$ $\quad x-b \neq 0 \Rightarrow x \neq b$ $\quad x-c \neq 0 \Rightarrow x \neq c$ $\quad x-d \neq 0 \Rightarrow x \neq d$

$$f(-x) = 5 \cdot \operatorname{arctg}(-x) \cdot \left(\frac{-x-a}{-x-a} + \frac{-x-b}{-x-b} + \frac{-x-c}{-x-c} + \frac{-x-d}{-x-d} \right) \qquad D_{f(-x)} = R - \{-a, -b, -c, -d\}$$

$= -f(x)$ NEPÁRNA lebo $\operatorname{arctg}(-x) = -\operatorname{arctg}(x)$

2.

$$g(x) = \cos[\sin(x^2)] \cdot \lg x + \sin[\cos^2(x^2+1)]$$

$$g'(x) = -\sin[\sin(x^2)] \cdot \cos(x^2) \cdot 2x \cdot \lg x + \cos[\sin(x^2)] \cdot \frac{1}{\cos^2 x} + \cos[\cos^2(x^2+1)] \cdot 2 \cdot \cos(x^2+1) \cdot [-\sin(x^2+1)] \cdot 2x$$

$$= -\sin[\sin(x^2)] \cdot \cos(x^2) \cdot 2x \cdot \lg x + \frac{\cos[\sin(x^2)]}{\cos^2 x} - 4\cos[\cos^2(x^2+1)] \cdot \cos(x^2+1) \cdot \sin(x^2+1) \cdot x$$

3.

$q: -5x + 2y + 1 = 0$

$y = \frac{5x-1}{2} = \frac{5x}{2} - \frac{1}{2}$

$k_q = \frac{5}{2}$

$k_t \cdot k_q = -1$

$k_t = -\frac{2}{5}$

$t \perp q$

$k_t = h'(x_0) = -\frac{2}{5}$

$x_0 = 1$

$\frac{1}{x_0} - \frac{7}{5} \cdot x_0 = -\frac{2}{5}$

$1 - \frac{7}{5} = -\frac{2}{5}$

$\Rightarrow \boxed{h(x) = \ln x - \frac{7}{10}x^2}$

$h(x_0) = \ln 1 - \frac{7}{10} \cdot 1^2 = -\frac{7}{10}$

$t: y - 0{,}7 = -\frac{2}{5}(x-1)$

$n: y - 0{,}7 = \frac{5}{2}(x-1)$