

5. minitest RMF

Varianta A

1. 11. 2024

Vypočtěte druhou derivaci funkce f v \mathcal{D}'

$$f(x) = |x| + |x^2 + 5x|$$

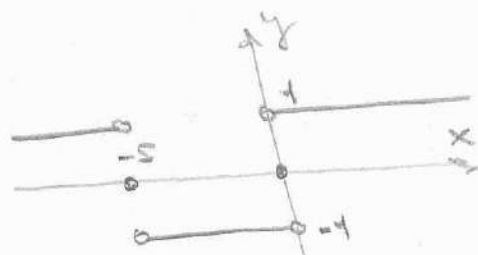
$$f'(x) = \text{sgn}(x) + (2x+5) \cdot \text{sgn}(x^2+5x)$$

$$f''(x) = 0 + 2 \text{sgn}(x^2+5x) + (2x+5) \cdot 0$$

$$+ \delta(x) \cdot \left(\underbrace{\lim_{x \rightarrow 0^+} f'(x)}_6 - \underbrace{\lim_{x \rightarrow 0^-} f'(x)}_{-6} \right)$$

$$+ \delta(x+5) \cdot \left(\underbrace{\lim_{x \rightarrow -5^+} f'(x)}_{-1+5} - \underbrace{\lim_{x \rightarrow -5^-} f'(x)}_{-1-5} \right)$$

$$= \underline{2 \text{sgn}(x^2+5x) + 12 \delta(x) + 10 \delta(x+5)}$$



$$\text{sgn}(x^2+5x) = \text{sgn}(x(x+5))$$

5. minitest RMF

Varianta B

1. 11. 2024

Vypočítejte druhou derivaci funkce f v D'

$$f(x) = |x| + \sin|3x|$$

$$f'(x) = \operatorname{sgn} x + \underbrace{3 \cos|3x|}_{\cos(3x)} \cdot \operatorname{sgn}(3x)$$

$$f''(x) = -9 \sin(3x) \cdot \operatorname{sgn}(3x) + \delta(x) \cdot \left(\underbrace{\lim_{x \rightarrow 0_+} f'(x)}_{4} - \underbrace{\lim_{x \rightarrow 0_-} f'(x)}_{-4} \right)$$

$$= \underline{\underline{-9 \sin(3x) \cdot \operatorname{sgn}(3x) + 8 \cdot \delta(x)}}$$