

edoceralph

Wendepunkte:

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

$$f'''(x) \neq 0$$

Aufgabe 1

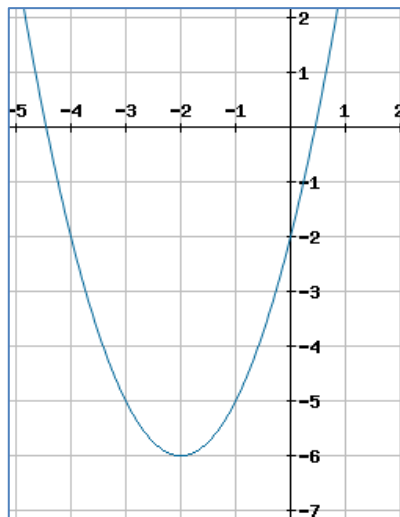
$$f(x) = x^2 + 4x - 2$$

$$f'(x) = 2x + 4$$

$$f''(x) = 2 = 0$$



Kein Wendepunkt



Aufgabe 2

$$f(x) = \frac{1}{30}x^3 - \frac{1}{10}x^2 + \frac{2}{5}x - \frac{1}{5}$$

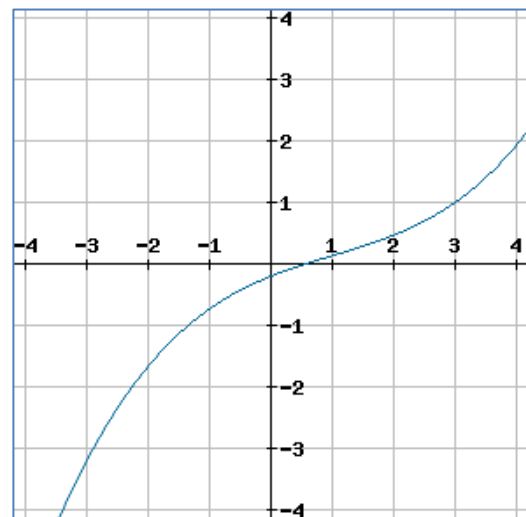
$$f'(x) = \frac{1}{10}x^2 - \frac{1}{5}x + \frac{2}{5}$$

$$f''(x) = \frac{1}{5}x - \frac{1}{5} = 0 \quad \Rightarrow \quad x_1 = 1$$

$$f'''(x) = \frac{1}{5} \neq 0$$

$$f(1) = \frac{2}{15}$$

WP $(1 | \frac{2}{15})$



Aufgabe 3

$$f(x) = x^2 \cdot e^x$$

$$f'(x) = (x^2 + 2x) \cdot e^x$$

$$f''(x) = (x^2 + 4x + 2) \cdot e^x = 0$$

$$\text{pq-Formel: } x_1 = -\sqrt{2}-2, \quad x_2 = \sqrt{2}-2$$

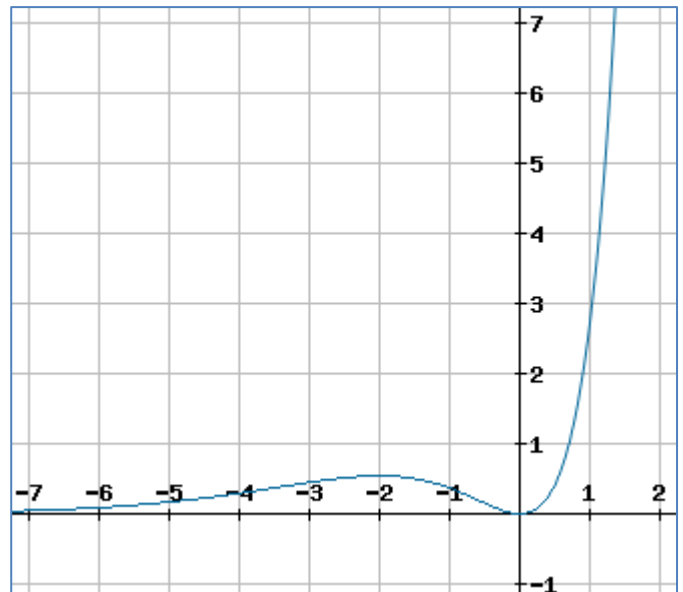
$$f'''(x) = (x^2 + 6x + 6) \cdot e^x$$

$$f'''(-\sqrt{2}-2) \approx -0,09 \neq 0$$

$$f'''(\sqrt{2}-2) \approx 1,57 \neq 0$$

$$f(-\sqrt{2}-2) \approx 0,38$$

$$f(\sqrt{2}-2) \approx 0,19$$



$$\text{WP}_1(-\sqrt{2}-2 | 0,38) = \text{WP}_1(-3,41 | 0,38)$$

$$\text{WP}_2(\sqrt{2}-2 | 0,19) = \text{WP}_2(-0,59 | 0,19)$$

Aufgabe 4

$$f(x) = x^3 - 2x^2$$

$$f'(x) = 3x^2 - 4x$$

$$f''(x) = 6x - 4 = 0 \quad \Rightarrow \quad x_1 = \frac{2}{3}$$

$$f'''(x) = 6 \neq 0$$

$$f'''(\frac{2}{3}) = -\frac{16}{27}$$

$$f(\frac{2}{3}) = -\frac{16}{27}$$

$$\text{WP}(\frac{2}{3} | -\frac{16}{27})$$

