

Übungen

Bestimme die Wendepunkte, soweit sie vorhanden sind.

1. $f(x) = 3x^4 - 16x^3 + 6x^2 - 48x$

$$f'(x) = 12x^3 - 48x^2 + 12x - 48$$

$$f''(x) = 36x^2 - 96x + 12$$

$$f'''(x) = 72x - 96$$

2. $f(x) = x^3 - 9x^2 + 27x - 25$

$$f'(x) = 3x^2 - 18x + 27$$

$$f''(x) = 6x - 18$$

$$f'''(x) = 6$$

3. $f(x) = x^5 - x^3$

$$f'(x) = 5x^4 - 3x^2$$

$$f''(x) = 20x^3 - 6x$$

$$f'''(x) = 60x^2 - 6$$

4. $f(x) = \frac{2}{3}x^3 + x^2 - 7,5x - 12$

$$f'(x) = 2x^2 + 2x - 7,5$$

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

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

5. $f(x) = 0,25x^4 - 4,5x^2 + 5$

$$f'(x) = x^3 - 9x$$

$$f''(x) = 3x^2 - 9$$

$$f'''(x) = 6x$$

6. $f(x) = \frac{1}{6}x^3 + x^2 + x$

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

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

$$f'''(x) = 1$$

7. $f(x) = x + \frac{1}{x^2}$

$$f'(x) = 1 - x^{-2}$$

$$f''(x) = 2x^{-3}$$

$$f'''(x) = -6x^{-4}$$

8. $f(x) = a \cdot x^3 - 4x^2$

$$f'(x) = 3a \cdot x^2 - 8x$$

$$f''(x) = 6a \cdot x - 8$$

$$f'''(x) = 6a$$