Ableitungsfunktionen

$$f(x) = x^n$$

$$f'(x) = n \cdot x^{n-1}$$

Summenregel

Bilde die Ableitung der folgenden Funktionen.

a)

$f(x) = 2x^3 + 7x + 1$

$f(x) = 4x^5 + 3x^2 + 4x^3$

$f(x) = 4x^3 + 10x^2 + 2x$

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

b)

$f(x) = 4x^{-7} + 5x^3 + 4x^2$

$f(x) = x^{-3} + 2x + 4$

$f(x) = 5x^{-2} + 2x^2 + 3x$

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

c)

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

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

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

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

d)

$f(x) = sin(x) + cos(x)$

$f(x) = x^{-7} + sin(x) + 3$

$f(x) = -sin(x) + x$

$f(x) = cos(x) + 7x^2 + x$

e)

$f(x) = e^x + x$

$f(x) = e^x + x^{-2}$

$f(x) = 2e^x - sin(x)$

$f(x) = sin(x) + e^x + e^{2k}$

f)

$f(x) = \sqrt{x} - 2x$

$f(x) = \sqrt{x} - e^x$

$f(x) = 3 \cdot \sqrt{x} - cosx$

$f(x) = \sqrt{x} + 2 \cdot \sqrt{x}$

Summenregel Lösungen

a)

$f'(x) = 6x^2 + 7$

$f'(x) = 20x^4 + 6x + 12x^2$

$f'(x) = 12x^2 + 20x + 2$

$f'(x) = 6x - 4x^3$

b)

$f'(x) = -28x^{-8} + 15x^2 + 8x$

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

$f'(x) = -10x^{-3} + 4x + 3$

$f'(x) = -x^{-3} + x^2 + 5$

c)

$f'(x) = 4x^3 - 2x^{-3} - \frac{1}{x^2}$

$f'(x) = -3\frac{1}{x^4} + 2x + 6$

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

$f'(x) = -\frac{6}{x^5} + \frac{4}{x^3} - \frac{1}{x^2}$

d)

$f'(x) = cos(x) - sin(x)$

$f'(x) = -7x^{-8} + cos(x)$

$f'(x) = -cos(x) + 1$

$f'(x) = -sin(x) + 12x + 1$

e)

$f'(x) = e^x + 1$

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

$f'(x) = 2e^x - cos(x)$

$f'(x) = cos(x) + e^x$

f)

$f'(x) = \frac{1}{2\sqrt{x}} - 2$

$f'(x) = \frac{1}{2\sqrt{x}} - e^x$

$f'(x) = \frac{3}{2\sqrt{x}} + sin(x)$

$f'(x) = \frac{3}{2\sqrt{x}}$