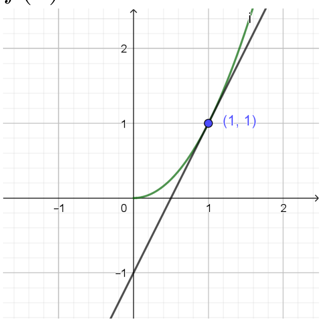
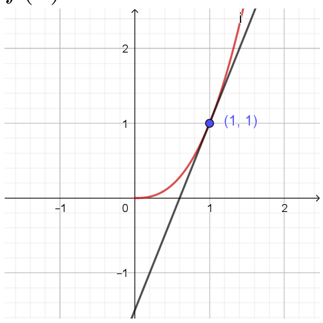
Gesucht war die Tangente durch den jeweils gegebenen Punkt.

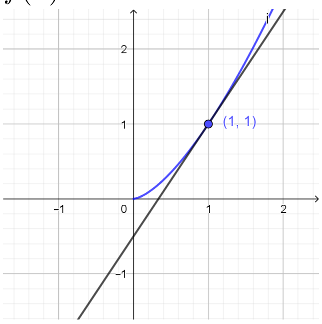
$f(x) = x^2$



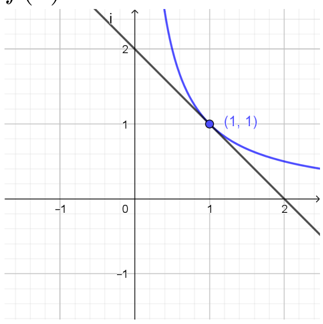
$f(x) = x^{\frac{5}{2}}$



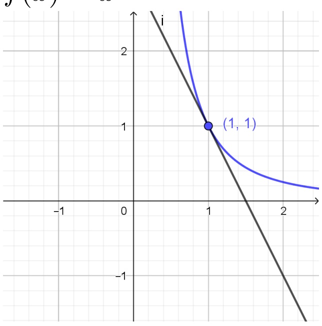
$f(x) = x^{\frac{3}{2}}$



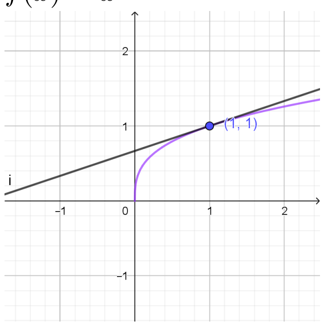
$f(x) = x^{-1}$



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



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



Gesucht war die Steigung der Funktion an einer gegebenen Stelle.

Hierfür bildet man zunächst die Ableitung $f'(x)$. Anschließend bestimmt man den Funktionswert der Ableitungsfunktion an gegebener Stelle $f'(x_0)$

(1) $f(x) = 3x^3 - 6$ $\quad x_0 = 2$
$\mathbf{f'(x) = 9x^2}$ $\quad \mathbf{f'(x2) = 36}$

(2) $f(x) = 4x^2 + 4x + 1$ $\quad x_0 = 0$
$\mathbf{f'(x) = 8x + 4}$ $\quad \mathbf{f'(x0) = 4}$

(3) $f(x) = 2x^3 - x^2 + 3x - 1$ $\quad x_0 = 4$
$\mathbf{f'(x) = 6x^2 + 2x + 3}$ $\quad \mathbf{f'(x4) = 107}$

(4) $f(x) = x^4 - 9x^2 + 2$ $\quad x_0 = -3$
$\mathbf{f'(x) = 4x^3 - 18x}$ $\quad \mathbf{f'(x - 3) = -54}$

(5) $f(x) = -2x^3 + 9x^2 - 2$ $\quad x_0 = -1$
$\mathbf{f'(x) = -6x^2 + 18x}$ $\quad \mathbf{f'(x - 1) = 24}$

(6) $f(x) = \frac{2}{3}x^3 - 2x^2 + 7x - 15$ $\quad x_0 = -2$
$\mathbf{f'(x) = 2x^2 - 4x + 7}$ $\quad \mathbf{f'(x - 2) = 23}$

Gesucht war die Ableitungsfunktion.

(1) $f(x) = -2x^4 + 5x^2 - 3$
$\mathbf{f'(x) = -8x^3 + 10x}$

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

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

(4) $f(x) = x^2 + 4x + 1$
$\mathbf{f'(x) = 2x + 4}$

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

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