Funktionen

- konstant
- linearen
- quadratischen
- ganz-rational

Potenz

- gebrochen-rational (Wurzel)

$x \longrightarrow y$

$f(x) = a x^0 = 2$

$f(x) = a \cdot x + b = \frac{1}{2}x + 2$

$f(x) = ax^2 + bx + c = 2x^2 - 3x + 1$

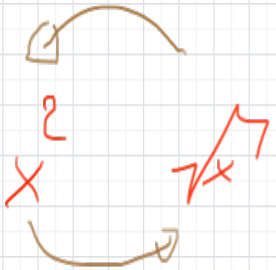
$f(x) = ax^n + bx^{n-1} + \ldots + wx^0$ n = Grad!

$f(x) = ax^z$

$f(x) = x^{\frac{3}{4}}$

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

$= \left(x^{\frac{1}{2}}\right)^2 = x^{\frac{1}{2} \cdot 2} = x^1$



- Exp./Log-Funktion
- Trigonometrisch

$f(x) = a^x$

$f(x) = \underline{e^x}$ $\quad f'(x) = \underline{e^x}$

$f(x) = \sin / \cos / \tan \ldots x$

Funktionen verbinden / ableiten

$u(x) = x^2$

$v(x) = 3e^x$

$u + v$	$x^2 + 3e^x$	$2x + 3e^x$
$u - v$	$x^2 - 3e^x$	$2x - 3e^x$
$u \cdot v$	$x^2 \cdot 3e^x$	
$u : v = \frac{u}{v}$	$\frac{x^2}{3e^x}$	
$u(v)$	$(3e^x)^2$	
$v(u)$	$3e^{(x^2)}$	

Produktregel

$f(x) = u \cdot v$

$f'(x) = u'v + u \cdot v'$

Quotientenregel

$f(x) = \frac{u}{v}$

$f'(x) = \frac{u'v - uv'}{v^2}$

Kettenregel

$f(x) = u(v(x))$

$f'(x) = v'(x) \cdot u'(v)$

f	u'/v	f'
$u \quad v$	$u' = 2x$	$f'(x) = 2x \cdot 3e^x + x^2 \cdot 3e^x$
$x^2 \cdot 3e^x$	$v' = 3e^x$	$= (6x + 3x^2) \cdot e^x$
$\frac{x^2}{3e^x}$		$f'(x) = \frac{2x \cdot 3e^x - x^2 \cdot 3e^x}{(3e^x)^2} = \frac{(2x - x^2) \cdot (3e^x)'}{(3e^x)^2}$
$(3e^x)^2$		$f'(x) = (3e^x) \cdot 2 \cdot (3e^x)' = 2 \cdot (3e^x)^2 = 18e^{x^2}$
$3e^{(x^2)}$		$f'(x) = 2x \cdot 3e^{x^2} = 6x \cdot e^{x^2}$

Integrale / Integrieren

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

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

$F(x) = \frac{1}{3} \cdot \frac{1}{4}x^3 + x^2$