

Ableitungsregeln (Differentiationsregeln)

Funktion	Ableitung	Beispiel
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Faktorregel

$y = c \cdot u$	$y' = c \cdot u'$	$y = 2x^2$ $y' = 2 \cdot 2x = 4x$
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Summenregel

$y = u \pm v$	$y' = u' \pm v'$	$y = x^3 + 2x^2$ $y' = 3x^2 + 4x$
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Produktregel

$y = u \cdot v$	$y' = u'v + uv'$	$y = x^3 \cdot \sin(x)$ $y' = 3x^2 \sin(x) + x^3 \cos(x)$
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Quotientenregel

$y = \frac{u}{v}$	$y' = \frac{u'v - uv'}{v^2}$	$y = \frac{x^3}{\sin(x)}$ $y' = \frac{3x^2 \cdot \sin(x) - x^3 \cdot \cos(x)}{\sin^2(x)}$
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Kettenregel

$y = u(v(x))$	$y' = v'(x) \cdot u'(v(x))$	$y = \sin(x^3)$ $y' = 3x^2 \cdot \cos(x^3)$
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Ableitung der Umkehrfunktion

$y = u(x)$ mit Umkehrfunktion $x = v(y)$	$y' = u'(x) = \frac{1}{v'(y)}$ $y' = u'(x) = \frac{1}{v'(u(x))}$	$y = \ln(x), \quad x = e^y, \quad (e^y)' = e^y$ $y' = \ln'(x) = \frac{1}{e^y}$ $y' = \ln'(x) = \frac{1}{e^{\ln(x)}} = \frac{1}{x}$
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