

Differentiationsformeln

weitere Formeln

x^n	$nx^{n-1}, \quad n \neq 1$
e^x	e^x
a^x	$a^x \ln a, \quad a > 0$
$\ln x $	$\frac{1}{x}, \quad x \neq 0$
$\ln_a x$	$\frac{1}{x \ln a}, \quad x > 0, a > 0$

$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\operatorname{tg} x$	$\frac{1}{\cos^2 x}, \quad x \neq (2k+1)\frac{\pi}{2}$
$\operatorname{ctg} x$	$-\frac{1}{\sin^2 x}, \quad x \neq k\pi$
$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}, \quad x < 1$
$\arccos x$	$-\frac{1}{\sqrt{1-x^2}}, \quad x < 1$
$\operatorname{arctg} x$	$\frac{1}{1+x^2}$
$\operatorname{arctg} x$	$-\frac{1}{1+x^2}$

$\operatorname{sh} x$	$\operatorname{ch} x$
$\operatorname{ch} x$	$\operatorname{sh} x$
$\operatorname{th} x$	$\frac{1}{\operatorname{ch}^2 x}$
$\operatorname{cth} x$	$-\frac{1}{\operatorname{sh}^2 x}$
$\operatorname{arsh} x$	$\frac{1}{\sqrt{x^2+1}}$
$\operatorname{arch} x$	$\frac{1}{\sqrt{x^2-1}}, \quad x > 1$
$\operatorname{arth} x$	$\frac{1}{1-x^2}, \quad x < 1$
$\operatorname{arcth} x$	$\frac{1}{1-x^2}, \quad x > 1$

$\cos^2 x = \frac{1 + \cos 2x}{2}$
$\sin^2 x = \frac{1 - \cos 2x}{2}$
$\sin x \sin y = \frac{1}{2}(\cos(x-y) - \cos(x+y))$
$\sin x \cos y = \frac{1}{2}(\sin(x+y) + \sin(x-y))$
$\cos x \cos y = \frac{1}{2}(\cos(x+y) + \cos(x-y))$
$\operatorname{tg}(x \pm y) = \frac{\operatorname{tg} x \pm \operatorname{tg} y}{1 \mp \operatorname{tg} x \operatorname{tg} y}$

$\operatorname{ch}^2 x - \operatorname{sh}^2 x = 1$
$\operatorname{arsh} x = \ln(x + \sqrt{x^2+1})$
$\operatorname{arch} x = \ln(x + \sqrt{x^2-1}), \quad x \geq 1$
$\operatorname{arth} x = \frac{1}{2} \ln \frac{1+x}{1-x}, \quad x < 1$
$\operatorname{arcth} x = \frac{1}{2} \ln \frac{x+1}{x-1}, \quad x > 1$