Formeln

Funktion	Differentiationsformel	Grundintegral
		(Die Integrationskonstante wurde überall weggelassen.)
Konstante	$(a)' = 0$	$\int a \, dx = a\,x$
Potenzfkt.	$(x^n)' = n \cdot x^{n-1}$	$\int x^n \, dx = \frac{x^{n+1}}{n+1} \quad (n \neq -1)$
	$\left(\frac{1}{x^n}\right)' = -\frac{n}{x^{n+1}} \quad (x \neq 0)$	$\int \frac{1}{x^n} \, dx = -\frac{1}{(n-1) \cdot x^{n-1}} \quad \binom{n > 1}{x \neq 0}$
	$\left(\sqrt[n]{x}\right)' = \frac{\sqrt[n]{x}}{n\,x}$	$\int \sqrt{x} \, dx = \frac{2}{3} \sqrt{x^3}$
	$\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$	$\int \frac{dx}{\sqrt{x}} = 2\sqrt{x}$
	$\left(\sqrt[n]{x^m}\right)' = \frac{m}{n} \cdot \sqrt[n]{x^{m-n}}$	$\int \sqrt[n]{x^m} \, dx = \frac{n}{m+n} \cdot \sqrt[n]{x^{m+n}}$
	$(x^x)' = x^x (\ln x + 1)$	
Exponentialfkt.	$(e^x)' = e^x$	$\int e^x \, dx = e^x$
	$(a^x)' = a^x \ln a \quad a > 0 \quad a \neq 1$	$\int a^x \, dx = \frac{a^x}{\ln a} \quad a > 0 \quad a \neq 1$
logarithm. Fkt.	$(\ln x)' = \frac{1}{x}$	$\int \frac{dx}{x} = \ln \lvert x \rvert \quad (x \neq 0)$
	$({}^a\log x)' = \frac{1}{\ln a} \cdot \frac{1}{x} = ({}^a\log e) \cdot \frac{1}{x}$	
	$(\lg x)' = \frac{1}{\ln 10} \cdot \frac{1}{x} = \frac{\lg e}{x} = \frac{M}{x}$	$(M = 0{,}4343)$
trigonom. Fkt.	$(\sin x)' = \cos x$	$\int \cos x \, dx = \sin x$
	$(\cos x)' = -\sin x$	$\int \sin x \, dx = -\cos x$
	$(\tan x)' = \frac{1}{\cos^2 x} = 1 + \tan^2 x$	$\int \frac{dx}{\cos^2 x} = \tan x \quad \left(x \neq \frac{(2k+1)\pi}{2}\right)$
	$(\cot x)' = -\frac{1}{\sin^2 x} = -1 - \cot^2 x$	$\int \frac{dx}{\sin^2 x} = -\cot x \quad (x \neq k\pi)$
zyklometr. Fkt.	$(\arcsin x)' = \frac{1}{\sqrt{1-x^2}}$	$\int \frac{dx}{\sqrt{1-x^2}} = \begin{cases} \arcsin x \\ -\arccos x \end{cases} \quad \lvert x \rvert < 1$
	$(\arccos x)' = -\frac{1}{\sqrt{1-x^2}} \quad \lvert x \rvert < 1$	
	$(\arctan x)' = \frac{1}{1+x^2}$	$\int \frac{dx}{1+x^2} = \begin{cases} \arctan x \\ -\operatorname{arccot} x \end{cases}$
	$(\operatorname{arccot} x)' = -\frac{1}{1+x^2}$	

Funktion	Differentiationsformel	Grundintegral
hyperbol. Fkt.	$(\sinh x)' = \cosh x$	$\int \cosh x \, dx = \sinh x$
	$(\cosh x)' = \sinh x$	$\int \sinh x \, dx = \cosh x$
	$(\tanh x)' = \frac{1}{\cosh^2 x} = 1 - \tanh^2 x$	$\int \frac{dx}{\cosh^2 x} = \tanh x$
	$(\coth x)' = -\frac{1}{\sinh^2 x} = 1 - \coth^2 x$	$\int \frac{dx}{\sinh^2 x} = -\coth x \quad (x \neq 0)$
Areafkt.	$(\operatorname{arsinh} x)' = \frac{1}{\sqrt{1+x^2}}$	$\int \frac{dx}{\sqrt{1+x^2}} = \operatorname{arsinh} x = \ln\left(x + \sqrt{1+x^2}\right)$
	$(\pm \operatorname{arcosh} x)' = \frac{1}{\pm\sqrt{x^2-1}} \quad \lvert x \rvert > 1$	$\int \frac{dx}{\sqrt{x^2-1}} = \begin{cases} \operatorname{arcosh} x & x > 1 \\ -\operatorname{arcosh}(-x) & x < -1 \end{cases} = \begin{cases} \ln\left(x + \sqrt{x^2-1}\right) & x > 1 \\ -\ln\left(-x + \sqrt{x^2-1}\right) & x < -1 \end{cases}$
	$(\operatorname{artanh} x)' = \frac{1}{1-x^2} \quad \lvert x \rvert < 1$	$\int \frac{dx}{1-x^2} = \operatorname{artanh} x = \ln\sqrt{\frac{1+x}{1-x}} \quad \lvert x \rvert < 1$
	$(\operatorname{arcoth} x)' = \frac{1}{1-x^2} = -\frac{1}{x^2-1} \quad \lvert x \rvert > 1$	$= \operatorname{arcoth} x = \ln\sqrt{\frac{x+1}{x-1}} \quad \lvert x \rvert > 1$

Regeln

	Differentiation	Integration
konst. Faktor	$[C \cdot f(x)]' = C \cdot f'(x)$	$\int C \cdot f(x) \, dx = C \int f(x) \, dx$
algebr. Summe	$[f(x) \pm g(x)]' = f'(x) \pm g'(x)$	$\int [f(x) \pm g(x)] \, dx = \int f(x) \, dx \pm \int g(x) \, dx$
Produktregel	$[u(x) \cdot v(x)]' = u'\,v + u\,v'$	$\int u\,v' \, dx = u \cdot v - \int u'\,v \, dx$ *(partielle Integration)*
Quotientenreg.	$\left[\frac{u(x)}{v(x)}\right]' = \frac{v\,u' - u\,v'}{v^2} \quad (v \neq 0)$	
Reziprokfkt.	$\left[\frac{1}{v(x)}\right]' = -\frac{v'}{v^2}$	
Kettenregel	$\frac{d}{dx} f\{v[u(x)]\} = \frac{df}{dv} \cdot \frac{dv}{du} \cdot \frac{du}{dx}$	
logarithm. Ableitung	$y' = y \cdot [\ln y(x)]' \quad y = f(x)$	$\int \frac{f'(x)}{f(x)} \, dx = \ln [f(x)]$
Abl. d. Umkehrfunktion	$f'(x) = \frac{1}{\varphi'(y)} \quad y = f(x),\ x = \varphi(y)$	