Deriváltak

$\mathbf{f(x)}$	$\mathbf{f'(x)}$
C(állandó)	0
x	1
x^α	$\alpha x^{\alpha-1}$
$\frac{1}{x}$	$-\frac{1}{x^2}$
$\sqrt{x}$	$\dfrac{1}{2\sqrt{x}}$
e^x	e^x
a^x	$a^x \ln a$
$\ln x$	$\dfrac{1}{x}$
$\log_a x$	$\dfrac{1}{x \ln a}$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\operatorname{tg} x$	$\frac{1}{\cos^2 x}$
$\operatorname{ctg} x$	$-\frac{1}{\sin^2 x}$
$\operatorname{sh} x = \frac{e^x - e^{-x}}{2}$	$\operatorname{ch} x$
$\operatorname{ch} x = \frac{e^x + e^{-x}}{2}$	$\operatorname{sh} x$
$\operatorname{th} x = \frac{\operatorname{sh} x}{\operatorname{ch} x}$	$\frac{1}{\operatorname{ch}^2 x}$
$\operatorname{cth} x = \frac{\operatorname{ch} x}{\operatorname{sh} x}$	$-\frac{1}{\operatorname{sh}^2 x}$
$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$
$\arccos x$	$-\frac{1}{\sqrt{1-x^2}}$
$\operatorname{arctg} x$	$\frac{1}{1+x^2}$
$\operatorname{arcctg} x$	$-\frac{1}{1+x^2}$
$\operatorname{arsh} x$	$\frac{1}{\sqrt{x^2+1}}$
$\operatorname{arch} x$	$\pm\frac{1}{\sqrt{x^2-1}}$
$\operatorname{arth} x$	$\frac{1}{1-x^2}$
$\operatorname{arcth} x$	$\frac{1}{1-x^2}$

Deriválási szabályok

$\mathbf{f(x)}$	$\mathbf{f'(x)}$
$af + bg$	$af' + bg'$
$f \cdot g$	$f'g + fg'$
$\frac{f}{g}$	$\frac{f'g - fg'}{g^2}$
$f(g(x))$	$f'(g(x))g'(x)$
$(\bar{f}(x))'$	$\frac{1}{f'(\bar{f}(x))}$

Integrálok

$\int k\,dx = kx + C$ $\qquad$ $\int x^\alpha dx = \frac{x^{\alpha+1}}{\alpha+1} + C \ \alpha \neq -1$

$\int e^x dx = e^x + C$ $\qquad$ $\int \frac{1}{x} dx = \ln|x| + C$

$\int \sin x\,dx = -\cos x + C$ $\qquad$ $\int \cos x\,dx = \sin x + C$

$\int \frac{dx}{\cos^2 x} = \operatorname{tg} x + C$ $\qquad$ $\int \frac{dx}{\sin^2 x} = -\operatorname{ctg} x + C$

$\int \frac{dx}{\sqrt{1-x^2}} = \arcsin x + C$ $\qquad$ $\int \frac{dx}{1+x^2} = \operatorname{arctg} x + C$

$\int \operatorname{ch} x\,dx = \operatorname{sh} x + C$ $\qquad$ $\int \operatorname{sh} x\,dx = \operatorname{ch} x + C$

$\int \frac{dx}{\operatorname{ch}^2 x} = \operatorname{th} x + C$ $\qquad$ $\int \frac{dx}{\sqrt{x^2+1}} = \operatorname{arsh} x + C$

$\int \frac{dx}{\sqrt{x^2-1}} = \operatorname{arch} x + C$ $\qquad$ $\int a^x dx = \dfrac{a^x}{\ln a} + C$

$\int \frac{dx}{1-x^2} = \frac{1}{2} \ln\left|\frac{1+x}{1-x}\right| + C$

Integrálási szabályok

$\int f^\alpha f' = \frac{f^{\alpha+1}}{\alpha+1} + C$ $\qquad$ $\int f(ax+b) = \frac{F(ax+b)}{a} + C$

$\int \frac{f'}{f} = \ln|f| + C$ $\qquad$ $\int f(g(x))g'(x) = F(g(x)) + C$

$\int uv' = uv - \int u'v$ parciális integrálás

u	v'
P	e^L
P	a^L
P	$\sin L$
P	$\cos L$
$\log_a x$	1
ar és arc	1

u	v'
$\sin L$	e^L
$\sin L$	a^L
$\cos L$	e^L
$\cos L$	a^L

P polinom,
$L = ax + b$
lineáris függvény

$t = \operatorname{tg}\frac{x}{2}$ hely.: $\sin x = \frac{2t}{1+t}$; $\quad \cos x = \frac{1-t^2}{1+t^2}$; $\quad \mathrm{d}x = \frac{2\mathrm{d}t}{1+t^2}$

Fourier-sor	Fourier-transzformáció
$x(t) = \sum_{n=-\infty}^{+\infty} X_n \exp(jn\omega t)$	$x(t) = \int_{-\infty}^{+\infty} X(\omega) \exp(j\omega t)\,\mathrm{d}\omega$
$X_n = \frac{1}{T}\int_0^T x(t) \exp(-jn\omega t)\,\mathrm{d}t$	$X(\omega) = \int_{-\infty}^{+\infty} x(t) \exp(-j\omega t)\,\mathrm{d}t$

$$x(t) = a_0 + \sum_{n=1}^{\infty} a_n \cos(n\omega t) + \sum_{n=1}^{\infty} b_n \sin(n\omega t) \quad \text{F-sor trig. alak}$$

Trigonometria

$\sin^2 x = \frac{1-\cos 2x}{2}$ $\qquad$ $\operatorname{sh}^2 x = \frac{\operatorname{ch} 2x - 1}{2}$ $\qquad$ $\sin x = \frac{j}{2}\exp(-jx) - \frac{j}{2}\exp(jx)$

$\cos^2 x = \frac{1+\cos 2x}{2}$ $\qquad$ $\operatorname{ch}^2 x = \frac{\operatorname{ch} 2x + 1}{2}$ $\qquad$ $\cos x = \frac{1}{2}\exp(-jx) + \frac{1}{2}\exp(jx)$

$2\sin\alpha\sin\beta = \cos(\alpha-\beta) - \cos(\alpha-\beta)$ $\qquad$ $e^{jx} = \exp(jx) = \cos x + j\sin x$

$2\cos\alpha\cos\beta = \cos(\alpha-\beta) + \cos(\alpha-\beta)$

$2\sin\alpha\cos\beta = \sin(\alpha-\beta) - \sin(\alpha-\beta)$

Óbudai Egyetem, Alba Regia Oktatási Központ, Szfvár, 2011. január 5.