Odvodi

$f(x)$	$f'(x)$
x^n	nx^{n-1}
a^x	$a^x\ln(x)$
e^x	e^x
$\ln x$	$\frac{1}{x}$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\frac{1}{\cos^2 x}$
$\cot x$	$-\frac{1}{\sin^2 x}$
$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$
$\arccos x$	$-\frac{1}{\sqrt{1-x^2}}$
$\arctan x$	$\frac{1}{1+x^2}$
$\operatorname{sh} x$	$\operatorname{ch} x$
$\operatorname{ch} x$	$-\operatorname{sh} x$
$\operatorname{th} x$	$\frac{1}{\operatorname{ch}^2 x}$
$\operatorname{cth} x$	$-\frac{1}{\operatorname{sh}^2 x}$
$\operatorname{arsh} x$	$\frac{1}{\sqrt{x^2+1}}$
$\operatorname{arth} x$	$\frac{1}{1-x^2}$

Integrali

$f(x)$	$\int f(x)dx$
x^n	$\frac{x^{n+1}}{n+1}(n \neq 1)$
$\frac{1}{x}$	$\ln\lvert x\rvert$
e^x	e^x
$\sin x$	$-\cos x$
$\cos x$	$\sin x$
$\frac{1}{\cos^2 x}$	$\tan x$
$\frac{1}{\sin^2 x}$	$-\cot x$
$\frac{1}{\sqrt{1-x^2}}$	$\arcsin x$
$\frac{1}{\sqrt{1+x^2}}$	$\operatorname{arsh} x = \ln\left\lvert x+\sqrt{x^2+1}\right\rvert$
$\frac{1}{1+x^2}$	$\arctan x$

Per Partes

$$\int f(x)g'(x)dx = f(x)g(x) - \int g(x)f'(x)dx$$

$$\int udv = uv - \int vdu$$

Racionalne funkcije

$\int \frac{p(x)}{q(x)}dx,\qquad p(x),\ q(x)$ sta polinoma

1. Če je $st(p(x)) <= st(p(x))$ polinoma delimo
2. $q(x)$ razdelimo na linearne in kvadratne faktorje
3. Izraz pod integralom razcepimo na parcialne ulomke
$\frac{p(x)}{q(x)} = \left[\frac{A_1}{x-a_1} + \cdots + \frac{A_{n_1}}{(x-a_1)^{n_1}}\right] + \cdots + \left[\frac{Z_1}{x-a_k} + \cdots + \frac{Z_{n_k}}{(x-a_k)^{n_k}}\right] +$
$\left[\frac{\alpha_1 x+\beta_1}{x^2+b_1x+c_1} + \cdots + \frac{\alpha_{m_1}x+\beta_{m_1}}{(x^2+b_1x+c_1)^{m_1}}\right] + \cdots + \left[\frac{\varphi_1 x+\omega_1}{x^2+b_lx+c_l} + \cdots + \frac{\varphi_{m_l}x+\omega_{m_l}}{(x^2+b_lx+c_l)^{m_l}}\right]$
4. Integriramo vsakega zase

$$k \geq 2 \qquad st(p(x)) \leq 2k-1$$

$$st(q(x)) \leq 2k-3 \qquad (ax^2+bx+c) \qquad \text{nerazcepen v } \mathbb{R}$$

$$I = \int \frac{p(x)}{(ax^2+bx+c)^k} = \int \frac{Ax+B}{ax^2+bx+c} + \frac{q(x)}{(ax^2+bx+c)^{k-1}}$$

A,B, $q(x)$ poiščemo tako da enačbo odvajamo.

Korenske funkcije

1. $\int f(\sqrt{ax+b})dx \qquad t=\sqrt{ax+b}$

2. $\int f(\sqrt{ax^2+bx+c})dx$

   a $\int \frac{dx}{\sqrt{ax^2+bx+c}}$ ga prevedemo na oblike:
   - Če je $a<0: \int \frac{dx}{\sqrt{1-x^2}} = \arcsin x$
   - Če je $a>0: \int \frac{dx}{\sqrt{x^2+c}} = \ln\left\lvert x+\sqrt{x^2+c}\right\rvert$

   b $\int \frac{p(x)}{\sqrt{ax^2+bx+c}} = q(x)\sqrt{ax^2+bx+c} + A\int \frac{dx}{\sqrt{ax^2+bx+c}}$
   $st(p(x))-1 = st(q(x))$ A, q(x) poiščemo z odvanjanjem

Kotne funkcije

1.

$$\int \sin(ax)\sin(bx)dx = \int -\frac{1}{2}\left[\cos(a+b)x - \cos(a-b)x\right]d$$

$$= -\frac{1}{2}\left[\frac{sin(a-b)x}{(a-b)} - \frac{sin(a+b)x}{(a+b)}\right]$$

$$\int \cos(ax)\cos(bx)dx = \int \frac{1}{2}\left[\cos(a+b)x + \cos(a-b)x\right]dx$$

$$\int \sin(ax)\cos(bx)dx = \int \frac{1}{2}\left[\sin(a+b)x + \sin(a-b)x\right]dx$$

2. $\int \cos^m x \sin^n x dx$

   (a) Eno od stevil m,n je liho (npr. $m=2k+1$)

$$\int \cos^{2k} x\cos x\sin^n x dx = \int t^n(1-t^2)^k dt$$

$$t=\sin x \quad dt=\cos x dx$$

$$cos^{2k}x = (cos^2x)^k = (1-t^2)^k$$

   (b) m, n sta oba soda, $m=2m_1$,$n=2n_1$

$$\int \cos^{2m_1} x\sin^{2n_1} x dx = \int (\cos^2 x)^{m_1}(\sin^2 x)^{n_1}dx =$$

$$= \int \left(\frac{1+\cos 2x}{2}\right)^{m_1}\left(\frac{1-\cos 2x}{2}\right)^{n_1} =$$

$$= \text{vsota integralov oblike} \int \cos^k 2x dx$$

   kjer je $k \leq m_1+n_1 = \frac{1}{2}(m+n) < m+1$
   Ce je k lih gremo po 1 tocki
   Ce je k sod ponovimo postopek

   (c) $\int R(\cos x, \sin x)dx$ ($R\ldots$ racinonalni izraz)

$$t=\tan\frac{x}{2} \quad \cos x = \frac{1-t^2}{t^2+1}$$

$$\sin x = \frac{2t}{t^2+1} \quad dx = \frac{2}{t^2+1}dt$$

$$t=\tan x \quad \cos x = \frac{1}{\sqrt{t^2+1}}$$

$$\sin x = \frac{t}{\sqrt{t^2+1}} \quad dx = \frac{dt}{t^2+1}$$

Kotne funkcije

Adicijski izreki

$$\sin x \pm y = \sin x \cos y \pm \sin y \cos x$$
$$\cos x \mp y = \cos x \cos y \mp \sin x \sin y$$
$$\tan x \pm y = \frac{\tan x + \tan y}{1 - \tan x \tan y}$$

Faktorizacija

$$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}$$
$$\sin x - \sin y = 2 \sin \frac{x-y}{2} \cos \frac{x+y}{2}$$
$$\cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2}$$
$$\cos x - \cos y = 2 \sin \frac{x-y}{2} \sin \frac{x+y}{2}$$

Razclenevanje

$$\sin x \sin y = -\frac{1}{2} \left(\cos (x+y) - \cos (x-y)\right)$$
$$\cos x \cos y = \frac{1}{2} \left(\cos (x+y) + \cos (x-y)\right)$$
$$\sin x \cos y = \frac{1}{2} \left(\sin (x+y) + \sin (x-y)\right)$$

$$\cos^2 x = \frac{\cos 2x + 1}{2} \qquad \sin^2 x = \frac{1 - \cos 2x}{2}$$