$$\int (x^n)dx = \frac{x^{n+1}}{n+1} + c$$

$$\int (e^{ax})dx = \frac{e^{ax}}{a} + c$$

$$\int (a^x)dx = \frac{a^x}{\log a} + c$$

$$\int \left(\frac{1}{x}\right)dx = \log x + c$$

$$\int \left(\frac{1}{x-a}\right)dx = \log(x-a) + c$$

$$\int \left(\frac{1}{(x-a)^m}\right)dx = -\frac{\quad}{(m-\dots}$$

$$\int \left(\frac{x}{(1+x^2)^m}\right)dx = -\frac{\quad}{2(m\dots}$$

$$\int \left(\frac{x}{(1+x^2)}\right)dx = \frac{1}{2}\,l\dots$$

$$\int (\sin x)dx = -\dots$$

$$\int (\cos x)dx = \sin x + c$$

$$\int \left(\frac{1}{\cos^2 x}\right)dx = \int (1+tg^2 x) = t\dots$$

$$\int \left(\frac{1}{\sqrt{1-x^2}}\right)dx = \arcsin x + c$$

$$\int \left(\frac{1}{1+x^2}\right)dx = \arctan x + c$$

$$\int \left(\frac{1}{\sqrt{a^2-x^2}}\right)dx = \arcsin\frac{x}{a} + c$$

$$\dots + c$$

$$\dots \sinh x + c$$

$$\int \left(\frac{1}{\sqrt{1+x^2}}\right) = \operatorname{arcsinh} x + C$$

$$= \log\left(x + \sqrt{1+x^2}\right.$$

$$\int \left(\frac{1}{x^2-1}\right) = \frac{1}{2}\log\left(\frac{x-1}{x+1}\right) + c$$

$$\int \frac{f'(x)}{f(x)}dx = \log(f(x))$$

$$\dots dx = \frac{1}{2}\sin 2x$$

$$\int_0^{\dots} \sin^2 x = \pi$$

$$\int \frac{1}{x^2+y^2}dy = \frac{1}{x}\arctan\left(\frac{y}{x}\right.$$

$$\int \frac{1}{(\dots)^3}dz = \frac{1}{2(\dots}$$

$$\sin^2 x = \frac{1}{2}(1-\cos 2x)$$

$$\sin^3 x = \sin^2 x \cdot \sin x = (1-\cos^2 x)\cdot \sin x \qquad \cos x = u$$

$$\cos^2 x = \frac{1}{2}(1+\cos 2x) \qquad -\sin x \cdot dx = du$$

$$\sin^4 x = \left(\frac{1}{2}(1+\cos 2x)\right)^2 = \frac{1}{4}(1-2\cos 2x + \cos^2 2x)$$

$$\cos^4 x = \frac{1}{4}(1+2\cos 2x + \cos^2 2x)$$

$$\cosh^2 x - \sinh^2 x = 1$$

$$\sinh x = \frac{e^x - e^{-x}}{2}$$

$$\cosh x = \frac{e^x + e^{-x}}{2}$$

$$(x^3+1) = (x+1)(x^2-x+1)$$

$$\sin 2x = 2\cdot \sin x \cdot \cos x$$

$$\cos 2x = \cos^2 x - \sin^2 x$$

$$\sin^2(\arccos x) = 1-\cos^2(\arccos x) = 1-x^2$$

$$\cos(\arccos x) = x$$

$$\cos^2(\arccos x) = [\cos(\arccos x)]^2 = x^2$$

Per-partes: $\int_a^b F(x)\cdot g(x)dx = [F(x)\cdot G(x)]_a^b - \int_a^b f(x)\cdot G(x)dx$

Nova spremenljivka: $\int_a^b F(g(x))\cdot g'(x)dx = \int f(u)\,du$

Primer $\Longrightarrow$ nova spremenljivka:

$\int R\left(x, \sqrt{x^2+a^2}\right) \Longrightarrow x = a\cdot \sin t$; $x = a\cdot \tan t$

$\int R\left(x, \sqrt{x^2-a^2}\right) \Longrightarrow x = a\cdot \cosh t$

$\int R\left(x, \sqrt{a^2-x^2}\right) \Longrightarrow x = a\cdot \sin t$; $x = a\cdot \cos t$

NOVA SPREMENLJIVKA: $\Phi(u,v) = \left(u\sqrt{uv}, v\sqrt{uv}\right) = (\Phi_1, \Phi_2)$

Jacobijeva determinanta: $J_\Phi = \begin{vmatrix} \frac{\partial\Phi_1}{\partial u} & \frac{\partial\Phi_1}{\partial v} \\ \frac{\partial\Phi_2}{\partial u} & \frac{\partial\Phi_2}{\partial v} \end{vmatrix} = \left(\frac{\partial\Phi_1}{\partial u}\cdot\frac{\partial\Phi_2}{\partial v}\right) - \left(\frac{\partial\Phi_1}{\partial v}\cdot\frac{\partial\Phi_2}{\partial u}\right)$

$$\iint_{\Phi(Q)} f(x,y)\,dxdy = \iint_Q f(x(u,v),y(u,v))\cdot|J_\varphi(u,v)|\cdot dudv$$

Površina ploskve nad funkcijo: $P = \iint_G \sqrt{1+\left(\frac{\partial F}{\partial x}\right)^2+\left(\frac{\partial F}{\partial y}\right)^2}\,dxdy$

POLARNE KOORDINATE: ko so zadeve v krogih

$\int xy\cdot dxdy = \int d\varphi \int r^2\cos\varphi\cdot\sin\varphi\cdot r\cdot dr$

$\Phi(r,\varphi) = (r\cos\varphi, r\sin\varphi)$

$x = r\cos\varphi$

$y = r\sin\varphi$

$J_\varphi = r$

krog premaknjen in zredišča:

$\Phi(r,\varphi) = (r\cos\varphi, r\sin\varphi)$

$x - 1 = r\cos\varphi$

$y - 1 = r\sin\varphi$

$J_\varphi = r$

CILINDRIČNE KOORDINATE:

$x = r\cos\varphi$

$y = r\sin\varphi$

$z = z$

$J_\varphi = r$

KROGELJNE KOORDINATE:

$x = r\cdot\sin\Theta\cdot\cos\varphi$ $\quad \Theta\in[0,\pi]$

$y = r\cdot\sin\Theta\cdot\sin\varphi$ $\quad \varphi\in[0,2\pi]$

$z = r\cdot\cos\Theta$

$J_\varphi = r^2\cdot\sin\Theta$

$x^2+y^2 = r^2\cdot\sin^2\Theta$

$x^2+y^2+z^2 = r^2$

premaknjene koordinate:

$\frac{x}{a} = r\cdot\sin\Theta\cdot\cos\varphi$ $\quad \Theta\in[0,\pi]$

$\frac{y}{b} = r\cdot\sin\Theta\cdot\sin\varphi$ $\quad \varphi\in[0,2\pi]$

$\frac{z}{c} = r\cdot\cos\Theta$

$J_\varphi = abc\cdot r^2\cdot\sin\Theta$

ENAČBE:

valj: $x^2+y^2=R^2$

krogla: $x^2+y^2+z^2=R^2$