

DERIVACE

$$(cf(x))' = cf'(x)$$

$$(f(x) \pm g(x))' = f'(x) \pm g'(x)$$

$$(f(x)g(x))' = f'(x)g(x) + f(x)g'(x)$$

$$\left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x)g(x) - f(x)g'(x)}{g^2(x)}$$

$$(f(g(x)))' = f'(g(x))g'(x)$$

$$(c)' = 0$$

$$(x^n)' = nx^{n-1}$$

$$(e^x)' = e^x$$

$$(a^x)' = a^x \ln a$$

$$(\ln x)' = \frac{1}{x}$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(\sin x)' = \cos x$$

$$(\cos x)' = -\sin x$$

$$(\operatorname{tg} x)' = \frac{1}{\cos^2 x}$$

$$(\operatorname{cotg} x)' = -\frac{1}{\sin^2 x}$$

$$(\arcsin x)' = \frac{1}{\sqrt{1-x^2}}$$

$$(\arccos x)' = -\frac{1}{\sqrt{1-x^2}}$$

$$(\operatorname{arctg} x)' = \frac{1}{1+x^2}$$

$$(\operatorname{arccotg} x)' = -\frac{1}{1+x^2}$$

INTEGRÁLY

$$\int cf(x) dx = c \int f(x) dx$$

$$\int (f(x) \pm g(x)) dx = \int f(x) dx \pm \int g(x) dx$$

$$\int u'(x)v(x) dx = u(x)v(x) - \int u(x)v'(x) dx$$

$$\int k dx = kx + c$$

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

$$\int \frac{1}{x} dx = \ln|x| + c$$

$$\int e^x dx = e^x + c$$

$$\int a^x dx = \frac{a^x}{\ln a} + c$$

$$\int \sin x dx = -\cos x + c$$

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

$$\int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + c$$

$$\int \frac{1}{\sin^2 x} dx = -\operatorname{cotg} x + c$$

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

$$\int \frac{1}{1+x^2} dx = \operatorname{arctg} x + c$$

TRANSFORMACE SOUŘADNIC

Polární souřadnice

$$x = r \cos \varphi$$

$$y = r \sin \varphi$$

$$|J| = r$$

Válcové souřadnice

$$x = r \cos \varphi$$

$$y = r \sin \varphi$$

$$z = z$$

$$|J| = r$$

Sférické souřadnice

$$x = r \cos \varphi \sin \psi$$

$$y = r \sin \varphi \sin \psi$$

$$z = r \cos \psi$$

$$|J| = r^2 \sin \psi$$