Opora paměti pro MECHcv

Derivace

Polynomy	
$f(x) = c$, c je konstanta	$f'(x) = 0$
$f(x) = x^c$, c je konstanta	$f'(x) = cx^{c-1}$
speciálně $f(x) = x$	$f'(x) = 1$

Mocniny, logaritmy	
$f(x) = c^x$, $c > 0$	$f'(x) = c^x \ln c$
speciálně $f(x) = e^x$	$f'(x) = e^x$
$f(x) = \log_a x$, $a > 0, a \neq 1$	$f'(x) = \frac{1}{x \ln a}$
speciálně $f(x) = \ln x$	$f'(x) = \frac{1}{x}$

Goniometrické funkce	
$f(x) = \sin x$	$f'(x) = \cos x$
$f(x) = \cos x$	$f'(x) = -\sin x$
$f(x) = \tan x$	$f'(x) = \frac{1}{\cos^2 x}$
$f(x) = \mathrm{cotan} x$	$f'(x) = -\frac{1}{\sin^2 x}$

Cyklometrické funkce	
$f(x) = \arcsin x$	$f'(x) = \frac{1}{\sqrt{1-x^2}}$
$f(x) = \arccos x$	$f'(x) = \frac{-1}{\sqrt{1-x^2}}$
$f(x) = \arctan x$	$f'(x) = \frac{1}{1+x^2}$
$f(x) = \mathrm{arccotan} x$	$f'(x) = \frac{-1}{1+x^2}$

Hyperbolické funkce	
$f(x) = \sinh x$	$f'(x) = \cosh x$
$f(x) = \cosh x$	$f'(x) = \sinh x$
$f(x) = \tanh x$	$f'(x) = \frac{1}{\cosh^2 x}$
$f(x) = \coth x$, $x \neq 0$	$f'(x) = \frac{-1}{\sinh^2 x}$

Hyperbolometrické funkce	
$f(x) = \mathrm{argsinh} x$	$f'(x) = \frac{1}{\sqrt{1+x^2}}$
$f(x) = \mathrm{argcosh} x$, $x > 1$	$f'(x) = \frac{1}{\sqrt{x^2-1}}$
$f(x) = \mathrm{argthg} x$, $\lvert x\rvert < 1$	$f'(x) = \frac{1}{1-x^2}$
$f(x) = \mathrm{argcoth} x$, $\lvert x\rvert > 1$	$f'(x) = \frac{1}{1-x^2}$

Některé primitivní funkce

$$\int x^n \mathrm{d}x = \frac{x^{n+1}}{n+1} + C,\ n \neq -1$$
$$\int \frac{1}{\mathrm{x}} \mathrm{d}x = \ln|x| + C,\ x \neq 0$$
$$\int \mathrm{a}^{\mathrm{x}} \mathrm{d}x = \frac{a^x}{\ln a} + C,\ a > 0$$
$$\text{speciálně} \int \mathrm{e}^{\mathrm{x}} \mathrm{d}x = e^x + C$$
$$\int \sin x \mathrm{d}x = -\cos x + C,\ \int \cos \mathrm{x} \mathrm{d}x = \sin x + C$$
$$\int \frac{1}{\sin^2 x} \mathrm{d}x = -\mathrm{cotan} x + C,\ x \neq n\pi$$
$$\int \frac{1}{\cos^2 x} \mathrm{d}x = \tan x + C,\ x \neq n\pi + \frac{\pi}{2}$$
$$\int \frac{1}{1+x^2} \mathrm{d}x = \arctan x + C = -\mathrm{arccotan} x + K$$
$$\int \frac{1}{\sqrt{1-\mathrm{x}^2}} \mathrm{d}x = \arcsin x + C = -\arccos x + K$$
$$\int \sinh \mathrm{x} \mathrm{d}x = \cosh x + C$$