MB202 cheatsheet

Goniometrické funkce

Limity

$$x^a << \beta^x << x! << x^x$$

$$\lim_{x\to\infty} (1+\frac{a}{x})^x = e^a$$

$$\lim_{x\to 0} \frac{\sin(x)}{x} = 1$$

L'Hospitalovo pravidlo

TODO: přidat tvary, pro které to platí (a hezky vycentrovat)

$$\lim_{x\to n} \frac{f(x)'}{g(x)'}$$

Taylorův polynom

$$T_n(x) = \sum_{i=0}^{n} \frac{f^{(i)}(x_0)}{i!} \cdot (x-x_0)^i$$

$$R_n(x) = \frac{f^{(n+1)}(c)}{(n+1)!} \cdot (x-x_0)^{n+1}$$

$$f(x) = T_n(x) + R_n(x)$$

Derivace

$$(x^r)' = rx^{r-1}$$

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

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

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

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

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

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

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

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

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

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

$$\cosh(x) := \frac{e^x + e^{-x}}{2} = (\sinh(x))'$$

$$\tanh(x) := \frac{\sinh(x)}{\cosh(x)}$$

$$\tanh(x) := \frac{\cosh(x)}{\sinh(x)}$$

Integrály

$$\int (f(x) = y)$$