KATEDRA PRÍRODNÝCH A HUMANITNÝCH VIED

FAKULTA VÝROBNÝCH TECHNOLÓGIÍ TU KOŠICE

SO SÍDLOM V PREŠOVE

PREHĽAD DERIVAČNÝCH A INTEGRAČNÝCH VZORCOV

Študijná pomôcka

2019

Derivačné vzorce:

$[c]' = 0,$ kde c je konštanta

$[x^\alpha]' = \alpha \cdot x^{\alpha-1}$

$[e^x]' = e^x$

$[a^x]' = a^x \ln a$

$[\ln x]' = \dfrac{1}{x}$

$[\log_a x]' = \dfrac{1}{x \ln a}$

$[\sin x]' = \cos x$

$[\cos x]' = -\sin x$

$[\operatorname{tg} x]' = \dfrac{1}{\cos^2 x}$

$[\operatorname{cotg} x]' = -\dfrac{1}{\sin^2 x}$

$[\arcsin x]' = \dfrac{1}{\sqrt{1-x^2}}$

$[\arccos x]' = \dfrac{-1}{\sqrt{1-x^2}}$

$[\operatorname{arctg} x]' = \dfrac{1}{1+x^2}$

$[\operatorname{arccotg} x]' = \dfrac{-1}{1+x^2}$

$[c \cdot f(x)]' = c \cdot f'(x)$

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

$[f(x) \cdot g(x)]' = f'(x) \cdot g(x) + f(x) \cdot g'(x)$

$\left[\dfrac{f(x)}{g(x)}\right]' = \dfrac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{g^2(x)}$

$[f(g(x))]' = f'(g(x)) \cdot g'(x)$

Integračné vzorce:

$\int \mathrm{d}x = x + c$

$\int x^\alpha \, \mathrm{d}x = \dfrac{x^{\alpha+1}}{\alpha+1} + c$ pre $\alpha \neq -1$

$\int e^x \, \mathrm{d}x = e^x + c$

$\int a^x \, \mathrm{d}x = \dfrac{a^x}{\ln a} + c$ pre $a \neq 1$

$\int \dfrac{1}{x} \, \mathrm{d}x = \ln|x| + c$

$\int \cos x \, \mathrm{d}x = \sin x + c$

$\int \sin x \, \mathrm{d}x = -\cos x + c$

$\int \dfrac{1}{\cos^2 x} \, \mathrm{d}x = \operatorname{tg} x + c$

$\int \dfrac{1}{\sin^2 x} \, \mathrm{d}x = -\operatorname{cotg} x + c$

$\int \dfrac{\mathrm{d}x}{\sqrt{a^2 - x^2}} = \begin{cases} \arcsin \dfrac{x}{a} + c, \\ -\arccos \dfrac{x}{a} + c \end{cases}$

$\int \dfrac{\mathrm{d}x}{a^2 - x^2} = \dfrac{1}{2a} \ln \left| \dfrac{a+x}{a-x} \right| + c$

$\int \dfrac{\mathrm{d}x}{a^2 + x^2} = \begin{cases} \dfrac{1}{a} \operatorname{arctg} \dfrac{x}{a} + c, \\ -\dfrac{1}{a} \operatorname{arccotg} \dfrac{x}{a} + c \end{cases}$

$\int \dfrac{\mathrm{d}x}{\sqrt{x^2 + k}} = \ln \left| x + \sqrt{x^2 + k} \right| + c$

$\int c \cdot f(x) \, \mathrm{d}x = c \cdot \int f(x) \, \mathrm{d}x,$ kde $c \neq 0$

$\int [f(x) \pm g(x)] \, \mathrm{d}x = \int f(x) \, \mathrm{d}x \pm \int g(x) \, \mathrm{d}x$

$\int \dfrac{f'(x)}{f(x)} \, \mathrm{d}x = \ln|f(x)| + c$

$\int f'(x) \cdot g(x) \, \mathrm{d}x = f(x) \cdot g(x) - \int f(x) \cdot g'(x) \, \mathrm{d}x$