Predmet: Mataliza 1
Ukol: 6.
Verze: 1.
Autor: David Napravnik
Prezdivka: DN

Spolecne zadani

Urcete definicni obory funkci a spoctete jejich derivace

zadani

$\sqrt{\frac{x-1}{x^2+1}}$

reseni

Definicni obor: $x \geq 1$
Pro derivaci pouzijeme pravidlo $(g(f))' = g'(f) * f'$
$= \frac{1}{2}\left(\frac{x-1}{x^2+1}\right)^{-\frac{1}{2}} * \left(\frac{x-1}{x^2+1}\right)'$
pouzijeme pravidlo $\left(\frac{f}{g}\right)' = \frac{f'g-fg'}{g^2}$
$= \frac{1}{2}\left(\frac{x-1}{x^2+1}\right)^{-\frac{1}{2}} * \frac{(x-1)'(x^2+1)-(x-1)(x^2+1)'}{(x^2+1)^2}$
pouzijeme pravidlo $(f+g)' = f' + g'$
$= \frac{1}{2}\left(\frac{x-1}{x^2+1}\right)^{-\frac{1}{2}} * \frac{(x^2+1)-2x(x-1)}{(x^2+1)^2}$
$= \frac{1}{2}\left(\frac{x^2+1}{x-1}\right)^{\frac{1}{2}} * \frac{x^2+1-2x(x-1)}{(x^2+1)^2}$
$\underline{\underline{= \frac{\sqrt{\frac{x^2+1}{x-1}}*(-x^2+2x+1)}{2(x^2+1)^2}}}$

zadani

$ln(sin(e^x))$

reseni

Definicni obor: $x \in \mathbb{R}$
Pro derivaci pouzijeme pravidlo $(g(f))' = g'(f) * f'$
$(\log(s))' = \frac{1}{s} * s'$
$s = \sin(t)$; $s' = \cos(t) * t'$
$t = e^x$; $t' = e^x$
$\underline{\underline{= \frac{cos(e^x)*e^x}{sin(e^x)}}}$

zadani

$x \cos x + \sin(2x^2)$

reseni

Definicni obor: $x \in \mathbb{R}$
Pro derivaci pouzijeme pravidlo $(f+g)' = f' + g'$
$(x\cos(x))' = -x * \sin(x) + \cos x$
$(\sin(2x^2))' = 4x * \cos(2x^2)$
$x \cos x + \sin(2x^2) = \underline{\underline{4x\cos(2x^2) - x\sin(x) + cos(x)}}$

zadani

$2^x + 3^x$

reseni

Definicni obor: $x \in \mathbb{R}$
Pro derivaci pouzijeme pravidlo $(f+g)' = f' + g'$
$= \underline{\underline{2^x \log(2) + 3^x \log(3)}}$

zadani

e^{-x^2}

reseni

Definicni obor: $x \in \mathbb{R}$
Derivace:
$= e^{-x^2} * (-x^2)' = \underline{\underline{e^{-x^2} * (-2x)}}$

zadani

$\arctan(\frac{1}{x})$

reseni

Definicni obor: $x \in \mathbb{R} \backslash 0$
Pro derivaci pouzijeme pravidlo $(g(f))' = g'(f) * f'$
$\arctan(y)' = \frac{1}{1+y^2} * y'$
$y = \frac{1}{x}; y' = -\frac{1}{x^2}$
$\arctan(\frac{1}{x}) = \underline{\underline{-\frac{1}{x^2+1}}}$