Esercizi derivate

18 dic 2020

ex $y = \frac{\ln(1-x^2)}{x} = x^{-1} \cdot \ln(1-x^2)$

$y' = \ln(1-x^2) \cdot (-1x^{-2}) + (x^{-1}) \cdot D[\ln(1-x^2)] =$

$= -\frac{\ln(1-x^2)}{x^2} + \frac{1}{x(1-x^2)} \cdot (-2x) = \frac{-(1-x^2)\ln(1-x^2) - 2x^2}{x^2(1-x^2)}$

ex $y = \ln \frac{3x^2-1}{x}$

$y' = \frac{x}{3x^2-1} \cdot D\left\{\frac{3x^2-1}{x}\right\} = \frac{x}{3x^2-1} \cdot \frac{D(3x^2-1)\cdot x - D(x)(3x^2-1)}{x^2} =$

$= \frac{\cancel{x}}{3x^2-1} \cdot \frac{6x^2 - 3x^2 + 1}{x^{\cancel{2}}} = \frac{3x^2+1}{(3x^2-1)x}$

ex $y = e^{\sqrt{x}} + \ln\sqrt{x}$

$y' = e^{\sqrt{x}} \cdot D\sqrt{x} + \frac{1}{\sqrt{x}} \cdot D\sqrt{x} = \frac{e^{\sqrt{x}}\sqrt{x}+1}{\sqrt{x}} \cdot \frac{1}{2}x^{-\frac{1}{2}} = \frac{e^{\sqrt{x}} \cdot \sqrt{x}+1}{2x}$

ex $y = \frac{x \ln x}{\sqrt{x}} = \sqrt{x} \cdot \ln x$

$y' = \sqrt{x} \cdot \frac{1}{x} + \frac{1}{2\sqrt{x}} \ln x = \frac{1}{\sqrt{x}} \cdot \left[\ln\sqrt{x} + 1\right] = \frac{\ln\sqrt{x}+1}{\sqrt{x}}$

ex $y = \operatorname{sen}^2 x - \tan(x^2-1)$

$y' = 2\operatorname{sen} x \cos x - \frac{2x}{\cos^2(x^2-1)} = \operatorname{sen} 2x - \frac{2x}{\cos^2(x^2-1)}$

ex $y = \ln \operatorname{sen}^2 x$

$y' = \frac{1}{\operatorname{sen}^2 x} \cdot 2\operatorname{sen} x \cdot \cos x = 2\cot x$