Raimundo Urtulla 2° EGO

Pregunta 1

$y = \operatorname{sen}(\ln(x)) + \cos(\ln(x))$

$y' = \cos(\ln(x)) \cdot \frac{1}{x} + (-\operatorname{sen}(\ln(x))) \cdot \frac{1}{x}$

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

$y' = \frac{\cos(\ln(x)) - \operatorname{sen}(\ln(x))}{x}$

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

$y'' = \frac{\left(-\operatorname{sen}(\ln(x)) \cdot \frac{1}{x} - \cos(\ln(x)) \cdot \frac{1}{x}\right) \cdot x - (\cos(\ln(x)) + \operatorname{sen}(\ln(x)))}{x^2}$

$y'' = \frac{-2\cos(\ln(x))}{x^2}$

$\frac{-2\cos(\ln(x))}{x^2} \cdot x^2 + \frac{\cos(\ln(x)) - \operatorname{sen}(\ln(x))}{x} \cdot x + \operatorname{sen}(\ln(x)) + \cos(\ln(x)) = 0$

$-2\cos(\ln(x)) + \cos(\ln(x)) - \operatorname{sen}(\ln(x)) + \operatorname{sen}(\ln(x)) + \cos(\ln(x)) = 0$

$-2\cos(\ln(x)) + \cos(\ln(x)) + \cos(\ln(x)) = 0$

$-2\cos(\ln(x)) + 2\cos(\ln(x)) = 0$

$0 = 0$

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Pregunta N°2

a) $y = 3^{\tan(x^3+x)}$ / ln

$\ln(y) = \tan(x^3+x) \cdot \ln(3)$

$\frac{y'}{y} = \sec^2(x^3+x)(3x^2+1) \cdot \ln(3)$

$y' = \sec^2(x^3+x)(3x^2+1) \cdot \ln(3) \cdot 3^{\tan(x^3+x)}$

b) $y = \frac{(e^x - x)^{10} \cdot (8+x^3)^2}{\sqrt{6+\sqrt{x}}}$ / ln

$\ln(y) = \frac{10\ln(e^x - x) \cdot 2\ln(8+x^3)}{\frac{1}{2}\ln(6+\sqrt{x})}$

$\ln(y) = 10\ln(e^x - x) + 2\ln(8+x^3) - \left(\frac{1}{2}\ln(6+\sqrt{x})\right)$

$\frac{y'}{y} = 10 \cdot \frac{1}{e^x - x} \cdot (e^x - 1) + 2 \cdot \frac{1}{8+x^3} \cdot 3x^2 - \frac{1}{2} \cdot \frac{1}{6+\sqrt{x}} \cdot \left(\frac{1}{2\sqrt{x}}\right)$

$y' = \left[\frac{10(e^x-1)}{e^x - x} + \left(\frac{6x^2}{8+x^3}\right) - \left(\frac{1}{2(6+\sqrt{x})(2\sqrt{x})}\right)\right] \cdot \left[\frac{(e^x-x)^{10}(8+x^3)^2}{\sqrt{6+\sqrt{x}}}\right]$

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Pregunta N° 3

a) $y^2 \quad x^3 + (sen(xy) - x\,ln(y)$ $\frac{dy}{dx}$

$2y \cdot y = 3x^2 + cos(xy)(y + xy') - (ln(y) + x \cdot \frac{1}{y} \cdot y')$

$2y \cdot y' + \frac{x}{y} \cdot y' - cos(xy)(xy') = 3x^2 - ln(y) + cos(xy) \cdot y$

$y'(2y + \frac{x}{y} - cos(xy)(x)) = 3x^2 - ln(y)$

$$y' = \frac{(3x^2 - ln(y))}{(2y + \frac{x}{y} - cos(xy)(x))}$$

b) $y + x \cdot \sqrt{1+2y} = x^2$ Determinar $y'(1,0)$

$y' + ((\sqrt{1+2y}) + x \cdot \frac{1}{2\sqrt{1+2y}} \cdot 2y' = 2x$

$y' + \sqrt{1} + 1 \cdot \frac{1}{2\sqrt{1}} \cdot 2y' = 2$

$y' + 1 + \frac{1}{2} \cdot 2y' = 2$

$y' + y' = 2 - 1$

$2y' = 1$

$y' = \frac{1}{2}$

Resumen unidad 2° Eco

Pregunta N° 4

a) $3x^2y + y^2 - 3x = 1$ pto A $(1, -4)$

$(6xy + 3x^2 \cdot y') + (2y \cdot y') - 3 = 0$

$(6(1)(-4) + 3(1)^2 \cdot y') + (2 \cdot (-4) \cdot y') - 3 = 0$

$-24 + 3y' - 8y' - 3 = 0$

$-27 = 5y'$

$y' = \frac{-27}{5}$

$m = \frac{-27}{5}$

$L: \quad y + 4 = \frac{-27}{5}(x - 1)$

$y = \frac{-27}{5}x + \frac{27}{5} - 4$

$L: \quad y = \frac{-27}{5}x + \frac{7}{5}$