Pregunta N°1.

$$y = sen(\ln(x)) + \cos(\ln(x)) \quad / \frac{d}{dx}$$

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

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

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

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

$$\frac{d^2y}{dx^2} \cdot x^2 + \frac{dy}{dx} \cdot x + y = 0$$

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

$$-2\cos(\cancel{\ln}(x)) + \cos(\cancel{\ln}(x)) - sen(\cancel{\ln}(x)) + \cancel{sen}(\ln(x)) + \cancel{\cos}(\ln(x))$$

$$(_s = 0 \,//$$

Sebastian Perez 2°G

Pregunta 2

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

$\ln(y) = \ln(3^{tg(x^3+x)})$

$\ln(y) = tg(x^3+x) \cdot \ln(3)$ / $\frac{d}{dx}$

$\frac{1}{y} \cdot y' = [\sec^2(x^3+x) \cdot (3x^2+1)] \cdot \ln(3) + \cancel{tg(x^3+x)} \cdot [\frac{1}{3} \cdot 0$

$y' = y[\sec^2(x^3+x) \cdot (3x^2+1)] \cdot \ln(3) + 0$

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

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

Pregunta 7.

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

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

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

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

$\ln(y) = [10 \cdot \ln(e^x - x) + 2\ln(8+x^3)] - [\frac{1}{2}\ln(6) + \frac{1}{4}\ln(x)]$

$\frac{1}{y} \cdot y' = [10 \cdot \frac{1}{e^x - x} \cdot (e^x - 1) + 2 \cdot \frac{1}{8+x^3} \cdot 3x^2] - [0 + \frac{1}{4} \cdot \frac{1}{x}]$

$y' = [\frac{10}{e^x - x} \cdot (e^x - 1) + \frac{6x^2}{8+x^3} - \frac{1}{4x}] \cdot \left(\frac{(e^x - x)^{10} \cdot (8+x^3)^2}{\sqrt{6+\sqrt{x}}}\right)$

Pregunta 2

c) $y = \dfrac{\operatorname{sen}(x) \cdot (x^2+x)^{3x}}{110}$

$\ln(y) = \ln(\operatorname{sen}(x)) + 3x \cdot \ln(x^2+x) - \ln(10)$

$\dfrac{1}{y} \cdot y' = \dfrac{1}{\operatorname{sen}(x)} \cdot \cos(x) + 3\ln(2x+1) + 3x \cdot \dfrac{1}{x^2+x}(2x-1) - 0$

$y' = y\left[\operatorname{cotg}(x) + 3\ln(x^2+x) + \dfrac{6x^2+3x}{x^2+x}\right]$

$y' = \left[\dfrac{\operatorname{sen}(x) \cdot (x^2+x)^{3x}}{110}\right]\left[\operatorname{cotg}(x) + 3\ln(x^2+x) + \dfrac{6x^2+3x}{x^2+x}\right]$

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Pregunta 3

A) $y^2 = x^3 + (\operatorname{sen}(xy)) - x\ln(y)$; $\frac{dy}{dx}$

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

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

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

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

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

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

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

$\cancel{y' = \frac{2x - \sqrt{1-2y}}{}}$

$y'(1 + \frac{x}{\sqrt{1+2y}}) \quad 2x - \sqrt{1-2y}$

$$y' = \frac{2x - \sqrt{1-2y}}{1 + \frac{x}{\sqrt{1+2y}}} = \frac{2(1) - \sqrt{1-2(0)}}{1 + \frac{1}{\sqrt{1+2(0)}}} = \frac{1}{2}$$

Pregunta 4.

a) Ec recta tg pto (1, -4)

$3x^2y + y^2 = 3x = 1$

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

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

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

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

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

$Lt = y - y_1 = m(x - x_1)$

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

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

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

Pregunta 4

6) Det L. Normal $f(x) = x^3 - 8x + 2$ $M_{t_g} = 4$

$y = x^3 - 8x + 2$ Si $M_t = 4$

$y' = 3x^2 - 8$ $M_{normal} = -\frac{1}{4}$

$3x^2 - 8 = 4$

$3x^2 = 12$

$\cancel{3}x^2 = \cancel{12}$

$x^2 = 4$

$x = 2$

Pto: $(2, -6)$

$y = 8 - 16 + 2$

$y = -6$

l_n : $y - y_1 = m_n (x - x_1)$

$y + 6 = -\frac{1}{4}(x - 2)$

$y = -\frac{1}{4}x + \frac{1}{2} - 6$

$y = -\frac{1}{4}x + \frac{11}{2}$ $= l_n$