

PREGUNTA 1

Javier Ceballos 2ºE

$$y = \text{sen}(\ln x) + \cos(\ln x) \rightarrow ' \rightarrow y' =$$

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

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

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

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

$$y'' = \frac{-2\cos(\ln x)}{x^2} \quad \left| \quad \frac{d^2y}{dx^2} \cdot x^2 + \frac{dy}{dx} \cdot x + y = 0 \right.$$

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

PREGUNTA 2

Jaime Cabezas 2ºE

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

$$\ln y = \text{Ty}(x^3+x) \cdot \ln(3) \rightarrow \cancel{\text{Ty}} \cdot \cancel{\frac{1}{y}} = \text{Sec}$$

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

→ derivamos la multiplicación

→ derivada de 3=0

$$\frac{y'}{y} = (\text{Sec}^2(x^3+x) \cdot (3x^2+1) \cdot \ln 3) + (\cancel{\text{Ty}(x^3+x)} \cdot \cancel{\frac{1}{3} \cdot 3})$$

$$\boxed{dy/dx = 3^{\text{Ty}(x^3+x)} (\text{Sec}^2(x^3+x) \cdot (3x^2+1) \cdot \ln 3)}$$

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

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

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

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

$$\frac{1}{\sqrt{6+\sqrt{x}}} \cdot \frac{1}{2\sqrt{6+\sqrt{x}}} \cdot 1 + \frac{1}{2\sqrt{x}} \cdot 1$$

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

$$c) \quad y = \frac{\sin x \cdot (x^2 + x)^{3x}}{110} \quad / \ln$$

$$\ln y = \frac{\ln(\sin x) \cdot \ln(x^2 + x)^{3x}}{\ln 110} = \frac{\ln(\sin x) \cdot 3x \ln(x^2 + x)}{\ln(110)}$$

$$\ln y = [\ln(\sin x) + 3x \ln(x^2 + x)] - \ln(110)$$

PREGUNTA 3a

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

$$\frac{dy}{dx} + \frac{d}{dx} (x \sqrt{1+2y}) = \frac{d}{dx} x^2$$

$$\frac{dy}{dx} + \sqrt{1+2y} + x \cdot \frac{1}{\sqrt{1+2y}} \cdot \frac{dy}{dx} = 2x$$

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

$$\frac{dy}{dx} \left(\frac{1+x}{\sqrt{1+2y}} \right) = 2x - \sqrt{1+2y} \quad / \cdot \sqrt{1+2y}$$

$$\frac{dy}{dx} (\sqrt{1+2y} + x) = 2x \cdot \sqrt{1+2y} - 1 - 2y$$

$$\frac{dy}{dx} = \frac{2x \sqrt{1+2y} - 2y - 1}{x + \sqrt{1+2y}} \quad \rightarrow \text{en } P_0(1, 0)$$

$$\frac{2\sqrt{1+0} - 0 - 1}{1 + \sqrt{1+0}} = \frac{2\sqrt{1} - 1}{1+1} = \boxed{\frac{1}{2}}$$