

Pregunta N°1

a) $\{-4, 0, 4\}$

b) $\{-3, 2, 10\}$

c) $R - \{-4, -3, 0, 2, 4, 10\}$

Pregunta N° 2

$$a) \lim_{x \rightarrow \frac{3\pi}{4}} \left(\frac{1 + \tan(x)}{\sin(x) + \cos(x)} \right) = \frac{0}{0} \text{ indet!}$$

$$\lim_{x \rightarrow \frac{3\pi}{4}} \left(\frac{1 + \frac{\sin(x)}{\cos(x)}}{\sin(x) + \cos(x)} \right)$$

$$\lim_{x \rightarrow \frac{3\pi}{4}} \left(\frac{\cancel{\cos(x)} + \sin(x)}{\cos(x)} \cdot \frac{1}{\cancel{\sin(x)} + \cos(x)} \right) = \frac{1}{\cos(x)} \cdot \frac{\sin(x) + \cos(x)}{\cos(x)}$$

$$\lim_{x \rightarrow \frac{3\pi}{4}} \frac{1}{\cos(x)} = \frac{1}{\cos \frac{3\pi}{4}} = \frac{1}{-\frac{\sqrt{2}}{2}} = \boxed{\frac{-2}{\sqrt{2}}}$$

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

$$\frac{(x^2 \sin(x) + x^2)}{(x^2 \cos(x) - x)} \cdot \frac{\cos(x)}{\cos(x)}$$

5th at

$$b) \lim_{x \rightarrow \infty} \frac{4x + \ln(3x)}{x \cdot \ln(x)} = \frac{0}{0}$$

$$\lim_{x \rightarrow \infty} \frac{4x + \ln(3x)}{x \cdot \frac{1}{\ln(x)}}$$

$$\lim_{x \rightarrow \infty} \frac{4x + \ln(3x)}{\ln(x)}$$

$$\lim_{x \rightarrow \infty} \frac{4x + \ln(3x)}{\ln(x)} = 4 + 3 = \boxed{7}$$

$$c) \lim_{x \rightarrow \infty} \frac{x^2 - 9}{x(x^2 + 1)} = \frac{\infty}{\infty} \text{ indet}$$

$$\lim_{x \rightarrow \infty} \frac{x^2 - 9}{x^3 + x} = \frac{0}{\infty} = \boxed{0}$$

$$= \frac{(x^2) \text{ not } + 1}{(x^3) \text{ not } + x}$$

Pregunta 3

a) $y = \ln(x) - \sin(x) + \frac{e^x}{4} - \ln(4)$

$$y' = \frac{1}{x} - \cos(x) + \left(\frac{e^x \cdot 4 - e^x \cdot 0}{4^2} \right) - 0$$

$$y' = \frac{1}{x} - \cos(x) + \frac{e^x}{4}$$

b) $y = (x^4 + x)(\sqrt{x} + \cos(x))$

$$y' = ((4x^3 + 1) \cdot (\sqrt{x} + \cos(x))) + ((x^4 + x) \cdot \frac{1}{2\sqrt{x}} - \sin(x))$$

c) $y = \frac{\tan(x)}{e^x}$

$$y' = \frac{(\sec^2(x) \cdot e^x) - (\tan(x) \cdot e^x)}{(e^x)^2}$$

5 atinges?

4:

$$(u) \ln \frac{x^2}{u} + (x \ln u - (x) \ln) = y \quad (6)$$

$$a) y = \sqrt{x^2 + \ln(x^3)}$$

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

$$b) y = (x+1)^4 \cdot \ln^3(2 + \ln(x))$$

$$y' = (4(x+1)^3 \cdot \ln^3(2 + \ln(x))) + (x+1)^4 \cdot 3\ln^2(2 + \ln(x))$$

$$y' = (4(x+1)^3 \cdot \ln^3(2 + \ln(x))) + ((x+1)^4 \cdot (3\ln^2(2 + \ln(x)) \cdot \cos(2 + \ln(x)) \cdot (10 + \frac{1}{x})))$$

$$c) y = \frac{e^x}{x^{5+x^3}}$$

$$\frac{(x) \ln u}{x^3} = y \quad (7)$$

$$y' = \frac{(e^{x^5} \cdot 5x^4) \cdot (x^5 + x^3) - (e^{x^5}) \cdot (5x^4 + 3x^2)}{(x^5 + x^3)^2}$$