

Sebastian Jenez

2E

Pregunta 1.

- a) Discontinua Reparable: $\{-4, 0, 4\}$
- b) Discontinua irreparable: $\{-3, 2, 10\}$
- c) Continua $\alpha: \mathbb{R} \rightarrow \{-4, 0, 4, -3, 2, 10\}$

Sebastião Jr. 03

7°C

Problema N° 2

$$a) \lim_{x \rightarrow \frac{3\pi}{4}} \left(\frac{1 + \tan(x)}{\sin(x) + \cos(x)} \right) = \frac{1 + 1}{\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}} = \frac{0}{0} \text{ ind}$$

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

$$\lim_{x \rightarrow \frac{3\pi}{4}} \frac{\sin(x) + \cos(x)}{\cos(x) \cdot [\sin(x) + \cos(x)]}$$

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

$$5) \lim_{x \rightarrow 0} \frac{4x + \sin(3x)}{x \cdot \sec(x)} = \frac{0}{0} \text{ ind}$$

$$\lim_{x \rightarrow 0} = \frac{4x}{x} + \frac{3 \cdot \cancel{\sin(3x)}}{\cancel{3x}} = \frac{4+3}{1 \cdot \cos(x)}$$

$$\lim_{x \rightarrow 0} = \frac{7}{\cos(x)} = \frac{7}{1} = \boxed{7}$$

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

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

$$\lim_{x \rightarrow \infty} = \frac{\frac{x^2}{x^3} - \frac{9 \cdot 0}{x^3}}{\frac{x^3}{x^3} + \frac{x}{x^3}} = \frac{0}{1} = \boxed{0}$$

Pregunto $\rightarrow$

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

$$y' = \frac{1}{x} - \cos(x) + \frac{4e^x - e^x \cdot 0}{16} - \frac{1}{4}$$

$$y' = \frac{1}{x} - \cos(x) + \frac{4e^x}{16} - \left(\frac{1}{4} \cdot 0\right)$$

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

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

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

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

Sebastian Jerez

2.E

Pregunta 4

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

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

Más ordenado

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

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

$$y' = (4(x+1)^3 \cdot 1) \cdot \sin^2(2+\ln(x)) + (x+1)^4 \cdot 3\sin^2(2+\ln(x)) \cdot \cos(2+\ln(x)) \cdot (0 + \frac{1}{x})$$

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

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