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2°E

Pregunta 1

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

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

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

Pregunta N° 2

$$a) \lim_{x \rightarrow \frac{3\pi}{4}} \left(\frac{1 + \tan(x)}{\sec(x) + \cos(x)} \right) \quad \frac{0}{0} \text{ indeterminado}$$

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

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

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

Pregunta 2

$$b) \lim_{x \rightarrow 0} \left(\frac{4x + \sin(3x)}{x - \sec(x)} \right) = \frac{0}{0} \text{ indeterminado}$$

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

$$\lim_{x \rightarrow 0} \left(\frac{4x + \sin(3x)}{x / \cos(x)} \right) \begin{matrix} \div : x \\ \div : x \end{matrix}$$

$$\lim_{x \rightarrow 0} \left(\frac{4 + \frac{\sin(3x)}{3x}}{\frac{x}{x \cdot \cos(x)}} \right) = \frac{4 + 3}{\frac{1}{\cos(x)}} = 7 //$$

Pregunta 3

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

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

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

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

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

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

Pregunta 4

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

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

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

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

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

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

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

Pregunta 2

$$c) \lim_{x \rightarrow \infty} \left(\frac{x^2 - 4}{x(x^2 + 1)} \right)$$

$$\lim_{x \rightarrow \infty} \left(\frac{x^2 - 4}{x^3 + x} \right)$$

$$\lim_{x \rightarrow \infty} \left(\frac{x^3 \cdot \left(\frac{1}{x} - \frac{4}{x^3} \right)}{x^3 \cdot \left(1 + \frac{1}{x^2} \right)} \right)$$

$$\lim_{x \rightarrow \infty} \left(\frac{\frac{1}{x} - \frac{4}{x^3}}{1 + \frac{1}{x^2}} \right) = \frac{0}{1} = 0 //$$