

Philippe Chambas Model
2.8

Prueba de Matemáticas
nº 4

Pregunta nº 1

a) ~~$\mathbb{R} \setminus \{ \}$~~ $-4; 0; 4$

b) $-3; 2; 10$

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

Pregunta nº 2

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

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

$$\lim_{x \rightarrow \frac{3\pi}{4}} \frac{1}{\cos(x)} = \frac{1}{\cos(135)} = -\sqrt{2} //$$

$$b) \lim_{x \rightarrow 0} \left(\frac{4x + \sin(3x)}{x \sec(x)} \right) \quad \frac{0}{0} \text{ indet !!!}$$

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

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

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

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

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

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

$$= \frac{0}{1} = 0 //$$

Pregunta n° 3

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

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

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

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

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

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

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

Pregunta n° 4

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

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

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

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

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