

Prueba Matemática

Nombre: Rodrigo Herrera
Curso: 2^{DO} Eco
Fecha: 12 agosto 2020

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

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

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

2. a) $\lim_{x \rightarrow \frac{3\pi}{4}} \left(\frac{1 + \operatorname{tg}(x)}{\operatorname{sen}(x) + \cos(x)} \right) = \frac{1 + \operatorname{tg}(135^\circ)}{\operatorname{sen}(135^\circ) + \cos(135^\circ)} = \frac{0}{0} \text{ IND.!!}$

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

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

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

$$\lim_{x \rightarrow \frac{3\pi}{4}} \frac{1}{\cos(x)} \quad \text{EVALUAMOS:} \quad \frac{1}{-\frac{\sqrt{2}}{\sqrt{2}}} = \frac{-2}{\sqrt{2}}$$

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

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

$$\lim_{x \rightarrow 0} \frac{4x + \sin(3x) \cdot 3}{x \cdot \frac{1}{\cos(x)}} \quad \lim_{x \rightarrow 0} \frac{4x + 3\sin(3x)}{x \cdot \frac{1}{\cos(x)}} \quad \begin{matrix} 1 \\ 3x \end{matrix}$$

$$\lim_{x \rightarrow 0} \frac{4+3}{\frac{1}{\cos(x)}} \quad \text{EVALUO :} \quad \Rightarrow \frac{7}{1} = \boxed{7} //$$

$$c) \lim_{x \rightarrow \infty} \left(\frac{x^2 - 9}{x(x^2 - 1)} \right) \quad \frac{\infty}{\infty} = \text{INT} //$$

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

$$\lim_{x \rightarrow \infty} \frac{\cancel{x^2}^0}{\cancel{x^3}^0} - \frac{\cancel{9}^0}{\cancel{x^3}^0}$$

EVALUAMOS: $\frac{0}{1} = \boxed{0}$

3.

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

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

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

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

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

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

4.
a) $y = \sqrt{x^2 + \sqrt{\cos(x^3)}}$

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

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

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

MINVA

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

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