

Prueba Matemáticas.

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CURSO: 2º ECO

096

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P. 1)

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

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

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

P. 2.

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

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

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

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

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

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

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

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

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

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

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

d)

p.3 dy/dx

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

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

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

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

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

c)

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

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

P.4. $\frac{dy}{dx}$

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

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

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

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

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

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

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

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