

REPASO 2P CALCULO I

domingo, 14 de junio de 2026 21:28

1.- $\lim_{x \rightarrow \infty} (3^{1/x} + 1)^3$

$$\frac{k}{\infty} = 0$$

Evalando.-

$$= (3^{1/\infty} + 1)^3$$

$$= (3^0 + 1)^3$$

$$= (1 + 1)^3 = 2^3 = 8$$

2.- $\lim_{x \rightarrow 1} \frac{x^4 - 2x^3 + 2x - 1}{x^4 - 6x^3 + 13x^2 - 12x + 4}$

Evalando:

$$= \frac{(1)^4 - 2(1)^3 + 2(1) - 1}{(1)^4 - 6(1)^3 + 13(1)^2 - 12(1) + 4} = \frac{1 - 2 + 2 - 1}{1 - 6 + 13 - 12 + 4} = \frac{0}{0} \text{ Indefinido}$$

Para el Numerador
 $x^4 - 2x^3 + 2x - 1$

	1	-2	0	2	-1
1		1	-1	-1	1
	1	-1	-1	1	0
1		1	0	-1	
	1	0	-1	0	
1		1	1		
	1	1	0		
-1		-1			
	1	0			

Para el Denominador
 $x^4 - 6x^3 + 13x^2 - 12x + 4$

	1	-6	13	-12	4
1		1	-5	8	-4
	1	-5	8	-4	0
1		1	-4	4	
	1	-4	4	0	
2		2	-4		
	1	-2	0		
2		2			
	1	0			

$$\lim_{x \rightarrow 1} \frac{(x-1)(x-1)(x-1)(x+1)}{(x-1)(x-1)(x-2)(x-2)}$$

$$\lim_{x \rightarrow 1} \frac{(x-1)(x+1)}{(x-2)(x-2)}$$

$$= \frac{(1-1)(1+1)}{(1-2)(1-2)} = \frac{0 \cdot 2}{(-1) \cdot (-1)} = \frac{0}{1} = 0$$

3.- $\lim_{x \rightarrow 1} \frac{2x - \sqrt{x^2+3}}{3x - \sqrt{x^2+8}}$

$$a^2 - b^2 = (a-b)(a+b)$$

Evalando.-

$$= \frac{2(1) - \sqrt{(1)^2+3}}{3(1) - \sqrt{(1)^2+8}} = \frac{2 - \sqrt{4}}{3 - \sqrt{9}} = \frac{2-2}{3-3} = \frac{0}{0} \text{ Indeterminado}$$

$$\lim_{x \rightarrow 1} \frac{2x - \sqrt{x^2+3}}{3x - \sqrt{x^2+8}} \cdot \frac{2x + \sqrt{x^2+3}}{2x + \sqrt{x^2+3}} \cdot \frac{3x + \sqrt{x^2+8}}{3x + \sqrt{x^2+8}}$$

$$\lim_{x \rightarrow 1} \frac{[(2x)^2 - (\sqrt{x^2+3})^2] \cdot (3x + \sqrt{x^2+8})}{[(3x)^2 - (\sqrt{x^2+8})^2] \cdot (2x + \sqrt{x^2+3})}$$

$$\lim_{x \rightarrow 1} \frac{[4x^2 - x^2 + 3] \cdot (3x + \sqrt{x^2+8})}{[9x^2 - x^2 + 8] \cdot (2x + \sqrt{x^2+3})}$$

$$\lim_{x \rightarrow 1} \frac{(3x^2+3) \cdot (3x + \sqrt{x^2+8})}{(8x^2+8) \cdot (2x + \sqrt{x^2+3})}$$

$$\lim_{x \rightarrow 1} \frac{3(x^2+1) \cdot (3x + \sqrt{x^2+8})}{8(x^2+1) \cdot (2x + \sqrt{x^2+3})}$$

$$\lim_{x \rightarrow 1} \frac{3 \cdot (3x + \sqrt{x^2+8})}{8 \cdot (2x + \sqrt{x^2+3})}$$

Evalando.-

$$= 3(3(1) + \sqrt{(1)^2+8}) - 3(3 + \sqrt{9}) - 3 \cdot 6 - 9$$

evaluando.-

$$= \frac{3(3(1) + \sqrt{(1)^2 + 8})}{8(2(1) + \sqrt{(1)^2 + 3})} = \frac{3(3 + \sqrt{9})}{8(2 + \sqrt{4})} = \frac{3 \cdot 6}{8 \cdot 4} = \frac{9}{16}$$

4.- $\lim_{x \rightarrow 0} \frac{\text{Sen } 5x}{\text{Sen } 3x}$

$$\lim_{x \rightarrow 0} \frac{\text{Sen}(a)}{(a)} = 1$$

Evaluando.-

$$= \frac{\text{Sen}(5 \cdot 0)}{\text{Sen}(3 \cdot 0)} = \frac{\text{Sen}(0)}{\text{Sen}(0)} = \frac{0}{0} \text{ Indeterminado}$$

$$\lim_{x \rightarrow 0} \frac{\frac{\text{Sen } 5x}{x}}{\frac{\text{Sen } 3x}{x}}$$

$$\lim_{x \rightarrow 0} \frac{\frac{5}{5} \cdot \frac{\text{Sen } 5x}{x}}{\frac{3}{3} \cdot \frac{\text{Sen } 3x}{x}} \Rightarrow \lim_{x \rightarrow 0} \frac{5 \cdot \frac{\text{Sen } 5x}{5x}}{3 \cdot \frac{\text{Sen } 3x}{3x}}$$

Evaluando.- $= \frac{5 \cdot (1)}{3 \cdot (1)} = \frac{5}{3}$

5.- $\lim_{x \rightarrow \infty} \frac{3x^2 + 2x + 1}{5x^2 - x + 4}$

Evaluando.- $= \frac{3(\infty)^2 + 2(\infty) + 1}{5(\infty)^2 - (\infty) + 4} = \frac{\infty}{\infty} \text{ Indeterminado}$

$$\lim_{x \rightarrow \infty} \frac{\frac{3x^2 + 2x + 1}{x^2}}{\frac{5x^2 - x + 4}{x^2}}$$

$$\frac{k}{\infty} = 0$$

$$\lim_{x \rightarrow \infty} \frac{\frac{3x^3}{x^5} + \frac{2x}{x^2} + \frac{1}{x^2}}{\frac{5x^2}{x^2} - \frac{x}{x^2} + \frac{4}{x^2}} \Rightarrow \lim_{x \rightarrow \infty} \frac{3 + \frac{2}{x} + \frac{1}{x^2}}{5 - \frac{1}{x} + \frac{4}{x^2}}$$

Evaluando.-

$$= \frac{3 + \frac{2}{\infty} + \frac{1}{\infty^2}}{5 - \frac{1}{\infty} + \frac{4}{\infty^2}}$$

$$= \frac{3 + 0 + 0}{5 - 0 + 0} = \frac{3}{5}$$

DERIVAR POR DEFINICION

a) $f(x) = x^2 + 2x$

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}$$

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 + 2(x + \Delta x) - (x^2 + 2x)}{\Delta x}$$

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{x^2 + 2x\Delta x + \Delta^2 x + 2x + 2\Delta x - x^2 - 2x}{\Delta x}$$

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{2x\Delta x + \Delta^2 x + 2\Delta x}{\Delta x}$$

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{\Delta x (2x + \Delta x + 2)}{\Delta x} = \lim_{\Delta x \rightarrow 0} (2x + \Delta x + 2)$$

$$f'(x) = 2x + 0 + 2$$

$$f'(x) = 2x + 2$$

$$b) f(x) = \frac{1}{x}$$

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{\frac{1}{(x+\Delta x)} - \left(\frac{1}{x}\right)}{\Delta x}$$

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{\frac{\cancel{x} - \cancel{x} - \Delta x}{x \cdot (x + \Delta x)}}{\Delta x} = \lim_{\Delta x \rightarrow 0} \frac{\frac{-\Delta x}{x \cdot (x + \Delta x)}}{\Delta x}$$

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{\frac{-\cancel{\Delta x}}{\cancel{\Delta x} \cdot x \cdot (x + \Delta x)}}{\Delta x} = \lim_{\Delta x \rightarrow 0} \frac{-1}{x(x + \Delta x)}$$

$$f'(x) = \lim_{\Delta x \rightarrow 0} - \frac{1}{x^2 + x\Delta x}$$

$$f'(x) = - \frac{1}{x^2 + x \cdot 0}$$

$$f'(x) = - \frac{1}{x^2}$$

NUEVA FUERZA
FINANCIERA