

Práctico N° 7 –Matemática I - 3° MD

1. Calcular los siguientes límites:

$$\begin{array}{llll} \lim_{x \rightarrow -5} \frac{x+5}{x^2} = & \lim_{x \rightarrow 3} \frac{x+1}{x-4} + x^2 = & \lim_{x \rightarrow 2} (3x^2 + 2x) & \lim_{x \rightarrow -1} (-3x^2 + 4x - 3) \\ \lim_{x \rightarrow 0^{\pm}} \frac{x+3}{x^2 + 2x} & \lim_{x \rightarrow 3^{\pm}} \frac{21}{(x-3)} & \lim_{x \rightarrow -\frac{5}{2}} \frac{3x+1}{2x+5} & \lim_{x \rightarrow 0^{\pm}} \frac{x^4 + 5x^3 + 4x^2}{x^5 - x^3} \\ \lim_{x \rightarrow 2} \frac{x \cdot (x-2)}{2x-4} = & \lim_{x \rightarrow 2} \frac{x^2 + 2x - 8}{x-2} = & \lim_{x \rightarrow -2} \frac{x^2 + 4x + 4}{x^2 + 2x} = & \lim_{x \rightarrow 0} \frac{3x^2 + 2x}{x^2 + x} = \\ \lim_{x \rightarrow 0} \frac{3x^2 + x}{x^3 + 4x} = & \lim_{x \rightarrow -1} \frac{-2x^2 + 3x + 5}{-3x^2 + x + 4} & \lim_{x \rightarrow -2} \frac{x^3 + 8}{-3x^2 - x + 10} & \\ \lim_{x \rightarrow -1} \frac{x^3 - 4x^2 + x + 6}{x^2 + x} = & \lim_{x \rightarrow 2} \frac{5x^3 - 15x^2 + 20}{3x^3 - 15x^2 + 24x - 12} & \lim_{x \rightarrow 3} \frac{2}{x-3} - \frac{12}{x^2 - 9} & \end{array}$$

2. Calcular los siguientes límites:

$$\begin{array}{llll} \lim_{x \rightarrow +\infty} \frac{1}{x} = & \lim_{x \rightarrow +\infty} \frac{13}{x^2} = & \lim_{x \rightarrow -\infty} \frac{\sqrt[4]{129}}{x^2 + 1} = & \lim_{x \rightarrow +\infty} \frac{3x^2 + 1}{x^2} = \\ \lim_{x \rightarrow +\infty} \frac{3x+1}{x^2} = & \lim_{x \rightarrow +\infty} \frac{3x^2 + 1}{x} = & \lim_{x \rightarrow +\infty} \frac{3x^2 + x}{x^3 + 4x} = & \lim_{x \rightarrow -\infty} \frac{2x+1}{x-5} \\ \lim_{x \rightarrow +\infty} \frac{x^2 + 1x + 3}{x+4} = & \lim_{x \rightarrow +\infty} \frac{x-1}{x^2-1} - \frac{x-2}{x-1} = & \lim_{x \rightarrow +\infty} \frac{2x^2 - 5x + 7}{x+3} - 2x = & \end{array}$$

3. Deducir dominio, signo, límites infinitos y límites laterales en puntos de no existencia de las siguientes funciones, luego grafique una función que cumpla con todo lo hallado.

$$\begin{array}{lll} f : f(x) = \frac{-3x-3}{x} & g : g(x) = \frac{-3x^2+3}{x+5} & h : h(x) = \frac{x^2-7x+10}{(x-5)^2} \\ i : i(x) = \frac{-2x^2+x+1}{-x^2+4x-3} & j : j(x) = -\frac{-x^2+25}{(x^2-3x-10)(-2x-10)} & \end{array}$$

4. Calcular los siguientes límites:

$$\begin{array}{llll} \lim_{x \rightarrow 0} L|x+1| = & \lim_{x \rightarrow +\infty} L|x+3| = & \lim_{x \rightarrow -\infty} L \left| \frac{x+1}{2} \right| = & \lim_{x \rightarrow -5} L|x| = \\ \lim_{x \rightarrow +\infty} e^{x+3} = & \lim_{x \rightarrow 1} e^{\frac{x-1}{x^2+2x-3}} = & \lim_{x \rightarrow 0} 4e^{\frac{x^2+2x}{4x^2+x}} = & \lim_{x \rightarrow +\infty} e^x + 2x = \\ \lim_{x \rightarrow \pm\infty} \frac{x^2-3x+1}{\sqrt{x^4+x-5}} & \lim_{x \rightarrow -\infty} \frac{\sqrt{x^2+1}}{5x-1} & \lim_{x \rightarrow -\infty} \left(\frac{x^2-4}{x-4} - \frac{x^2-6}{x-6} \right) & \lim_{x \rightarrow 0^+} \frac{Lx}{x+3} \\ \lim_{x \rightarrow \pm\infty} \frac{|2x^2-7|-|5x-2x^2|}{-x^2+3x-5} & \lim_{x \rightarrow -\infty} \frac{e^x+1}{L(-x)} & \lim_{x \rightarrow +\infty} \frac{e^{2x}+1}{e^x} & \lim_{x \rightarrow +\infty} \frac{L(x^3)}{L(2x)} \\ \lim_{x \rightarrow +\infty} \frac{L(x^3+2x^2+5x+3)}{L(2x)} & \lim_{x \rightarrow +\infty} \frac{L(x^3+2x^2+5x+3)}{L(5x^3+4x)} & & \end{array}$$

5. Calcular los siguientes límites:

$$\lim_{x \rightarrow +5} \left(\frac{\sqrt{x} - \sqrt{5}}{x - 5} \right) =$$

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

$$\lim_{x \rightarrow -\infty} \left(\sqrt{x^2 + 4x + 5} + x \right)$$

$$\lim_{x \rightarrow 2} \frac{\sqrt{x+2} - \sqrt{2x}}{3x - 6}$$

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

6. Calcular los siguientes límites:

$$\lim_{x \rightarrow 1} \frac{Lx}{2x - 2}$$

$$\lim_{x \rightarrow 0} \frac{L(1 + 3x)}{2x}$$

$$\lim_{x \rightarrow 0^+} \frac{L(1 + \sqrt{x})}{2x}$$

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

$$\lim_{x \rightarrow 1} \frac{e^{x^2-1} - 1}{3x - 3}$$

$$\lim_{x \rightarrow +\infty} 2x^2 \left(e^{\frac{5}{x^2}} - 1 \right)$$

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

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

$$\lim_{x \rightarrow +\infty} (x+1) e^{\frac{3}{x-2}} - x$$

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

$$\lim_{x \rightarrow -\infty} (2x - 5) e^{\frac{1}{x+1}} - 2ex$$

$$\lim_{x \rightarrow 0} \frac{L \left(\frac{1+x}{1-x} \right)}{x^2 - x}$$

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

7. Calcular los siguientes límites:

$$\lim_{x \rightarrow +\infty} \frac{Lx}{x+3}$$

$$\lim_{x \rightarrow +\infty} \frac{Lx}{e^x + 3}$$

$$\lim_{x \rightarrow +\infty} \frac{Lx + x}{e^x + 3}$$

$$\lim_{x \rightarrow +\infty} \frac{Lx + x}{2x + 3}$$

$$\lim_{x \rightarrow +\infty} \frac{x.Lx}{3x+5}$$

$$\lim_{x \rightarrow +\infty} \frac{x.Lx}{e.x + \pi}$$

$$\lim_{x \rightarrow +\infty} \frac{3^{x-2}}{L|x^2 + 1|}$$

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

$$\lim_{x \rightarrow +\infty} e^{2x-3} - L(x+5) - x^{35}$$

$$\lim_{x \rightarrow +\infty} x.Lx - 5x$$

$$\lim_{x \rightarrow +\infty} x.Lx - 5x^2$$

$$\lim_{x \rightarrow -\infty} x.e^x$$

$$\lim_{x \rightarrow +\infty} \frac{x^3 + 2x + 5}{2x^2 + 3} \cdot e^{-x^2 - 3x}$$