

CALCULA EL LÍMITE DE LAS SIGUIENTES FUNCIONES

1; $y = \frac{x^2 - 2x - 3}{x^2 + 3x + 2}$ = cuando $x \rightarrow -1$

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

$x \rightarrow -1$

	·	-2	-3
-1	-1	-3	
	1	-3	0

	1	3	2
-1	-1	-2	
	1	2	0

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

$x \rightarrow -1$

2; $y = \frac{x^2 - 3x + 2}{x^2 + 2x - 3}$ cuando $x \rightarrow 1$

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

$x \rightarrow 1$

	·	-3	2
1	1	-2	
	1	-2	0

	1	2	-3
1	1	3	
	1	3	0

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

$x \rightarrow 1$

3; y = $\frac{x^2 - x - 12}{x^2 + x - 20}$ cuando $x \rightarrow 4$

$$\lim_{x \rightarrow 4} \frac{x^2 - x - 12}{x^2 + x - 20} = \frac{4^2 - 4 - 12}{4^2 + 4 - 20} = \frac{0}{0}$$

$x \rightarrow 4$

.	-1	-12
4	4	12
1	3	0

1	1	-20
4	4	20
1	5	0

$$\lim_{x \rightarrow 4} \frac{(x+3) \cdot (-4)}{(x+5) \cdot (x-4)} = \lim_{x \rightarrow 4} \frac{x+3}{x+5} = \frac{4+3}{4+5} = \frac{7}{9}$$

$x \rightarrow 4$

$x \rightarrow 4$

4; y = $\frac{x^3 + 2x^2 - 17x + 15}{x^2 - x - 6}$ cuando $x \rightarrow 3$

$$\lim \frac{x^3 + 2x^2 - 17x + 15}{x^2 - x - 6} = \frac{3^3 + 2(3)^2 - 17(3) + 15}{3^2 - 3 - 6}$$

$$x \rightarrow 3$$

$$= \frac{27 + 18 - 51 + 15}{9 - 3 - 6} = \frac{9}{0}$$

5; $y = \frac{x^2 + 7x + 10}{x^2 - x - 6}$ cuando $x \rightarrow -2$

$$\lim \frac{x^2 + 7x + 10}{x^2 - x - 6} = \frac{-2^2 + 7(-2) + 10}{-2^2 + 2 - 6} = \frac{4 + 14 + 10}{4 + 2 - 6} = \frac{0}{0}$$

$$x \rightarrow -2$$

1	7	10
-2	-2	-10
1	5	0

1	-1	-6
-2	-2	6
1	-3	0

$$\lim \frac{(x+5) \cdot (x+2)}{(x-3) \cdot (x+2)} = \lim \frac{x+5}{x-3} = \frac{-2+5}{-2-3} = -\frac{3}{5}$$

6; $y = \frac{x^2 - 3x + 2}{x^2 - 5x + 6}$ cuando $x \rightarrow 2$

$$\lim \frac{x^2 - 3x + 2}{x^2 - 5x + 6} = \frac{2^2 - 3(2) + 2}{2^2 - 5(2) + 6} = \frac{4 - 6 + 2}{4 - 10 + 6} = \frac{0}{0}$$

$$x \rightarrow 2$$

1	-3	-2
2	2	-2
1	-1	0

1	-5	6
2	2	-6
1	-3	0

$$(x-1)(x-2)$$

$$(x-3)(x-2)$$

$$\lim_{x \rightarrow 2} \frac{(x-1)(x-2)}{(x-3)(x-2)} = \frac{x-1}{x-3} = \frac{2-1}{2-3} = \frac{1}{-1} = -1$$

$$x \rightarrow 2$$

7; $y = \frac{x^2 + x - 6}{x^2 - 4}$ cuando $x \rightarrow 2$

$$\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - 4} = \frac{2^2 + 2 - 6}{2^2 - 4} = \frac{0}{0}$$

$$x \rightarrow 2$$

		1	1	-6			1	-4	4
2		2	6		2		2	-4	
		1	3	0			1	-2	0

$$(x+3)(x-2)$$

$$(x-2)(x-2)$$

$$\lim_{x \rightarrow 2} \frac{(x+3)(x-2)}{(x-2)(x-2)} = \lim_{x \rightarrow 2} x + 3 = 2 + 3 = 5$$

$$x \rightarrow 2$$

$$x \rightarrow 2$$

8; $y = \frac{x^2 - x - 12}{x - 4}$ cuando $x \rightarrow 4$

$$\lim_{x \rightarrow 4} \frac{x^2 - x - 12}{x - 4} = \frac{4^2 - 4 - 12}{4 - 4} = \frac{0}{0}$$

$\begin{array}{r rrrr} & 1 & -1 & -12 & \\ 4 & & 4 & 12 & \\ \hline & 1 & 3 & 0 & \end{array}$	$\begin{array}{r rr} & 1 & -4 & \\ 4 & & 4 & \\ \hline & 1 & 0 & \end{array}$
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$$(x+3)(x+4) \quad (x)(x-4)$$

$$\lim_{x \rightarrow 4} \frac{(x+3)(x-4)}{(x)(x-4)} = \frac{x+3}{x} = \frac{4+3}{4} = \frac{7}{4}$$

$$x \rightarrow 2$$

9; $y = \frac{x^3 + 2x^2 - x - 2}{x^3 + 2x^2 - 9x - 18}$ cuando $x \rightarrow -2$

$$\lim_{x \rightarrow -2} \frac{x^3 + 2x^2 - x - 2}{x^3 + 2x^2 - 9x - 18}$$

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

			2	-9	-18				
-2		-2	0	18					
		1	0	-9	0				

$$\lim_{x \rightarrow 2} \frac{(x+2)(x^2-1)}{(x+2)(x^2-9)} = \frac{x^2-1}{x^2-9} = \frac{(-2)^2-1}{(-2)^2-9} = \lim_{x \rightarrow 2} \frac{4-1}{4-9} = \frac{3}{-5}$$

10; $y = \frac{\sqrt{x+1}-3}{x-8}$ cuando $x \rightarrow 8$

$$y = \frac{\sqrt{x+1}-3}{x-8} = \frac{\sqrt{x+1}+3}{\sqrt{x+1}+3}$$

$$y = \frac{(\sqrt{x+1}-3)(\sqrt{x+1})+3\sqrt{x+1}-3\sqrt{x+1}-9}{x\sqrt{x+1}+3x-8\sqrt{x+1}-24}$$

$$y = \frac{x-8}{x\sqrt{x+1}+3x-8\sqrt{x+1}-24}$$

$$\lim_{x \rightarrow 8} \frac{x-8}{x\sqrt{x+1}+3x-8\sqrt{x+1}-24}$$

$$y = \frac{8-8}{8(3)+24-8(8)-24} = \frac{0}{0} = \textit{indeterminado}$$