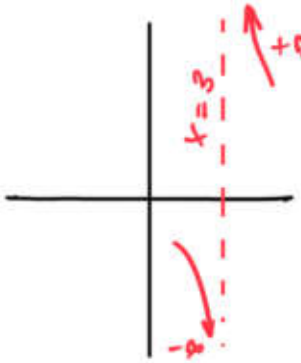
EJERCICIO MIBE2403:

a) $\lim_{x\to 3} \frac{5-x}{x^2-9} = \frac{5-3}{9-9} = \left(\frac{2}{0}\right) = \pm\infty$ → INDET



$\lim_{x\to 3^-} \frac{5-x}{x^2-9} = \frac{(+)}{(-)} = -\infty$

$\lim_{x\to 3^+} \frac{5-x}{x^2-9} = \frac{(+)}{(+)} = +\infty$

¡ $x=3$ es Asíntota Vertical !

b) $\lim_{x\to\infty} \frac{5x+3+2x^2}{5x^2+3x} = \left(\frac{\infty}{\infty}\right) =$ → INDET

$= \lim_{x\to\infty} \frac{\frac{5x+3+2x^2}{x^2}}{\frac{5x^2+3x}{x^2}} = \lim_{x\to\infty} \frac{\frac{5x}{x^2}+\frac{3}{x^2}+\frac{2x^2}{x^2}}{\frac{5x^2}{x^2}+\frac{3x}{x^2}} =$

$= \lim_{x\to\infty} \frac{\frac{5}{x}+\frac{3}{x^2}+2}{5+\frac{3}{x}} = \frac{\frac{5}{\infty}+\frac{3}{\infty}+2}{5+\frac{3}{\infty}} = \frac{0+0+2}{5+0} = \frac{2}{5}$

c) $\lim_{x\to 2} \frac{x^3-3x^2+4}{x^3-x^2-8x+12} = \ldots = \left(\frac{0}{0}\right) = \ldots$

Descomposición en factores por Ruffini

1er

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

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

2do

	1	-1	-8	12
2		2	2	-12
	1	1	-6	0
2		2	6	
	1	3	0	

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

$$\dots = \lim_{x\to 2} \frac{(x-2)^2(x+1)}{(x-2)^2(x+3)} = \lim_{x\to 2} \frac{(x+1)}{(x+3)} = \frac{3}{5}$$

d) $\lim_{x\to\infty} \frac{-x^3+2x+7}{\sqrt{x^2+3x+1}} = \left(\frac{\infty}{\infty}\right) =$ → INDET

$$= \lim_{x\to\infty} \frac{\frac{-x^3+2x+7}{x^3}}{\frac{\sqrt{x^2+3x+1}}{x^3}} = \lim_{x\to\infty} \frac{\frac{-x^3}{x^3}+\frac{2x}{x^3}+\frac{7}{x^3}}{\frac{\sqrt{x^2}}{x^3}+\frac{3x}{x^3}+\frac{1}{x^3}} =$$

$$= \lim_{x\to\infty} \frac{-1+\frac{2}{x^2}+\frac{7}{x^3}}{\frac{\sqrt{}}{x}+\frac{3}{x^2}+\frac{1}{x^3}} = \frac{-1+\frac{2}{\infty}+\frac{7}{\infty}}{\frac{\sqrt{}}{\infty}+\frac{3}{\infty}+\frac{1}{\infty}} =$$

$$= \frac{-1+0+0}{0+0+0} = \frac{-1}{0} = -\infty$$ Que cumple la regla de los grados

otra forma

$$= \lim_{x\to\infty} \frac{\frac{-x^3+2x+7}{x^2}}{\frac{\sqrt{x^2+3x+1}}{x^2}} = \lim_{x\to\infty} \frac{\frac{-x^3}{x^2}+\frac{2x}{x^2}+\frac{7}{x^2}}{\frac{\sqrt{x^2}}{x^2}+\frac{3x}{x^2}+\frac{1}{x^2}} =$$

$$= \lim_{x\to\infty} \frac{-x+\frac{2}{x}+\frac{7}{x^2}}{\sqrt{}+\frac{3}{x}+\frac{1}{x^2}} = \frac{-\infty+\frac{2}{\infty}+\frac{7}{\infty}}{\sqrt{}+\frac{3}{\infty}+\frac{1}{\infty}} =$$

$$= \frac{-\infty+0+0}{\sqrt{}+0+0} = \frac{-\infty}{\sqrt{}} = -\infty$$ Que cumple la regla