

# Indeterminaciones infinito partido infinito e infinito menos infinito

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A)  $\frac{\infty}{\infty}$

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

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

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

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

$\lim_{x \rightarrow \infty} \frac{P(x)}{Q(x)} = \begin{cases} \pm\infty & \text{si } \text{grado}(P(x)) > \text{grado}(Q(x)) \\ \frac{a_n}{b_n} & \text{si } \text{grado}(P) = \text{grado}(Q) \\ 0 & \text{si } \text{grado}(P(x)) < \text{grado}(Q(x)) \end{cases}$

$P(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$   
 $Q(x) = b_n x^n + b_{n-1} x^{n-1} + \dots + b_1 x + b_0$

## B) $\infty - \infty$

$$\lim_{x \rightarrow \infty} \left( \frac{x^2-3}{x-2} - \frac{2x^2-5x}{x+1} \right) = \infty - \infty \text{ Indeterminación.}$$

$$\lim_{x \rightarrow \infty} \left( \frac{x^2-3}{x-2} - \frac{2x^2-5x}{x+1} \right) = \lim_{x \rightarrow \infty} \left( \frac{(x^2-3)(x+1) - (2x^2-5x)(x-2)}{(x-2)(x+1)} \right) =$$

$$= \lim_{x \rightarrow \infty} \left( \frac{x^3-3x+x^2-3 - [2x^3-4x^2-5x^2+10x]}{x^2+x-2x-2} \right) = \lim_{x \rightarrow \infty} \frac{x^3-3x+x^2-3-2x^3+4x^2+5x^2-10x}{x^2-x-2} =$$

$$= \lim_{x \rightarrow \infty} \frac{-x^3-13x+10x^2-3}{x^2-x-2} = \boxed{-\infty}$$

$\infty - \infty$

$$\lim_{x \rightarrow \infty} (\sqrt{2x-6} - \sqrt{2x-3}) = \infty - \infty \text{ Indet.}$$

$$\lim_{x \rightarrow \infty} (\sqrt{2x-6} - \sqrt{2x-3}) = \lim_{x \rightarrow \infty} \frac{(\sqrt{2x-6} - \sqrt{2x-3})(\sqrt{2x-6} + \sqrt{2x-3})}{\sqrt{2x-6} + \sqrt{2x-3}} =$$

grado 0

$$\lim_{x \rightarrow \infty} (\sqrt{2x-6} - \sqrt{2x-3}) = \lim_{x \rightarrow \infty} \frac{\dots}{\sqrt{2x-6} + \sqrt{2x-3}} =$$

$$= \lim_{x \rightarrow \infty} \frac{(\sqrt{2x-6})^2 - (\sqrt{2x-3})^2}{\sqrt{2x-6} + \sqrt{2x-3}} = \lim_{x \rightarrow \infty} \frac{2x-6 - (2x-3)}{\sqrt{2x-6} + \sqrt{2x-3}} = \lim_{x \rightarrow \infty} \frac{-3}{\sqrt{2x-6} + \sqrt{2x-3}} = 0$$

↙ grado 0

↑  
grado 1/2