

### EJERCICIO MIBE-2416:

$$\begin{aligned} \lim_{x \rightarrow \infty} \sqrt{3x^2 - x} - 2x &= (\infty - \infty) \quad \rightarrow \text{INDEF} \\ &= \lim_{x \rightarrow \infty} \frac{(\sqrt{3x^2 - x} - 2x)(\sqrt{3x^2 - x} + 2x)}{(\sqrt{3x^2 - x} + 2x)} = \\ &= \lim_{x \rightarrow \infty} \frac{(\sqrt{3x^2 - x})^2 - (2x)^2}{\sqrt{3x^2 - x} + 2x} = \\ &= \lim_{x \rightarrow \infty} \frac{3x^2 - x - 4x^2}{\sqrt{3x^2 - x} + 2x} = \\ &= \lim_{x \rightarrow \infty} \frac{-x^2 - x}{\sqrt{3x^2 - x} + 2x} = \left(\frac{\infty}{\infty}\right) = \dots = -\infty \quad \begin{array}{l} \text{¡por el grado!} \\ \downarrow \end{array} \\ &= \lim_{x \rightarrow \infty} \frac{\frac{-x^2 - x}{x^2}}{\frac{\sqrt{3x^2 - x} + 2x}{x^2}} = \lim_{x \rightarrow \infty} \frac{\frac{-x^2}{x^2} - \frac{x}{x^2}}{\frac{\sqrt{3x^2 - x}}{x^2} + \frac{2x}{x^2}} = \\ &= \lim_{x \rightarrow \infty} \frac{-1 - \frac{1}{x}}{\sqrt{\frac{3x^2 - x}{x^4}} + \frac{2}{x}} = \lim_{x \rightarrow \infty} \frac{-1 - \frac{1}{x}}{\sqrt{\frac{3x^2}{x^4} - \frac{x}{x^4}} + \frac{2}{x}} = \\ &= \lim_{x \rightarrow \infty} \frac{-1 - \frac{1}{x}}{\sqrt{\frac{3}{x^2} - \frac{1}{x^3}} + \frac{2}{x}} = \frac{-1 - \frac{1}{\infty}}{\sqrt{\frac{3}{\infty} - \frac{1}{\infty} + \frac{2}{\infty}}} = \\ &= \frac{-1 - 0}{\sqrt{0 - 0 + 0}} = \frac{-1}{0} = -\infty \end{aligned}$$