Exemplo: $\lim_{x \to 0} \frac{\sqrt{x^2+9}-3}{x^2}$

In [ ]:

$$\lim_{x \to 0} \frac{(\sqrt{x^2+9}-3).(\sqrt{x^2+9}+3)}{x^2.(\sqrt{x^2+9}+3)} \tag{1}$$

$$\lim_{x \to 0} \frac{\sqrt{x^2+9}.\sqrt{x^2+9}+3.\sqrt{x^2+9}-3.\sqrt{x^2-9}-9}{x^2.(\sqrt{x^2+9}+3)} \tag{2}$$

$$\lim_{x \to 0} \frac{(\sqrt{x^2+9})^2+3.\sqrt{x^2+9}-3.\sqrt{x^2-9}-9}{x^2.(\sqrt{x^2+9}+3)} \tag{3}$$

$$\lim_{x \to 0} \frac{x^2+9+3.\sqrt{x^2+9}-3.\sqrt{x^2-9}-9}{x^2.(\sqrt{x^2+9}+3)} \tag{4}$$

$$\lim_{x \to 0} \frac{x^2}{x^2.(\sqrt{x^2+9}+3)} \tag{5}$$

$$\boxed{\lim_{x \to 0} \frac{1}{\sqrt{x^2+9}+3}} \tag{6}$$

$$\lim_{x \to 0} \frac{1}{\sqrt{0^2+9}+3} \tag{7}$$

$$\lim_{x \to 0} \frac{1}{0+3+3} \tag{8}$$

$$\boxed{\lim_{x \to 0} \frac{\sqrt{x^2+9}-3}{x^2} = \frac{1}{6}} \tag{9}$$

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