

# Exercício do Limite – Existência do limite

Tarefa do Moodle : Encontre se existe

$x$	$\frac{1}{x}$	$x$	$\frac{1}{x}$	$\lim_{x \rightarrow 0} \frac{1}{x} =$
1.0	1	-1.0	-1	$\lim_{x \rightarrow 0^-} \frac{1}{x} = -\infty$
0.5	2	-0.5	-2	
0.2	5	-0.2	-5	
0.1	10	-0.1	-10	$\lim_{x \rightarrow 0^+} \frac{1}{x} = +\infty$
0.05	20	-0.05	-20	
0.02	50	-0.02	-50	
0.01	100	-0.01	-100	

$+\infty$

$-\infty$

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

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

$$1 = \lim_{x \rightarrow \infty} \frac{\sqrt{2x^2+1}}{3x-5} = \frac{\infty}{\infty} = ?$$

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

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

$$= \frac{\sqrt{2 + \frac{1}{\cancel{x^2}}}}{3 - \frac{5}{\cancel{x}}} = \frac{\sqrt{2}}{3}$$