



Lista de Exercícios 4  
**LIMITES**

1) Calcule, se existir, os limites das funções abaixo:

$$(a) \lim_{x \rightarrow 1} (x^3 - 3);$$

$$(b) \lim_{x \rightarrow 2} \sqrt{x^4 - 8};$$

$$(c) \lim_{x \rightarrow 2} \sqrt{\frac{x^3 + 2x + 3}{x^2 + 5}};$$

$$(d) \lim_{x \rightarrow -3} \frac{x^2 - 9}{x + 3};$$

$$(e) \lim_{x \rightarrow \frac{1}{3}} \frac{3x^2 - x}{3x - 1};$$

$$(f) \lim_{x \rightarrow 3} \frac{x^3 - 27}{x - 3};$$

$$(g) \lim_{x \rightarrow 0} \frac{\sqrt{x + 3} - \sqrt{3}}{x};$$

$$(h) \lim_{x \rightarrow \frac{3}{2}} \sqrt{\frac{8t^3 - 27}{4t^2 - 9}};$$

$$(i) \lim_{x \rightarrow 3} \frac{2x^3 - 5x^2 - 2x - 3}{4x^3 - 13x^2 + 4x - 3};$$

$$(j) \lim_{y \rightarrow -3} \sqrt{\frac{y^2 - 9}{2y^2 + 7y + 3}};$$

$$(k) \lim_{h \rightarrow 5} \frac{h}{\sqrt{5 + h} - \sqrt{5}};$$

$$(l) \lim_{h \rightarrow 0} \frac{\sqrt{3 + 3h} - \sqrt{3}}{h};$$

$$(m) \lim_{x \rightarrow 2} \frac{x^4 - 16}{x - 2};$$

$$(n) \lim_{x \rightarrow 1} \frac{x - 1}{x^2 - 1}.$$

## RESPOSTAS

$$(a) \lim_{x \rightarrow 1} (x^3 - 3) = -2;$$

$$(b) \lim_{x \rightarrow 2} \sqrt{x^4 - 8} = 2\sqrt{2};$$

$$(c) \lim_{x \rightarrow 2} \sqrt{\frac{x^3 + 2x + 3}{x^2 + 5}} = \sqrt{\frac{5}{3}};$$

$$(d) \lim_{x \rightarrow -3} \frac{x^2 - 9}{x + 3} = -6;$$

$$(e) \lim_{x \rightarrow \frac{1}{3}} \frac{3x^2 - x}{3x - 1} = \frac{1}{3};$$

$$(f) \lim_{x \rightarrow 3} \frac{x^3 - 27}{x - 3} = 27;$$

$$(g) \lim_{x \rightarrow 0} \frac{\sqrt{x+3} - \sqrt{3}}{x} = \frac{\sqrt{3}}{6};$$

$$(h) \lim_{t \rightarrow \frac{3}{2}} \sqrt{\frac{8t^3 - 27}{4t^2 - 9}} = \sqrt{\frac{9}{2}};$$

$$(i) \lim_{x \rightarrow 3} \frac{2x^3 - 5x^2 - 2x - 3}{4x^3 - 13x^2 + 4x - 3} = \frac{11}{17};$$

$$(j) \lim_{y \rightarrow -3} \sqrt{\frac{y^2 - 9}{2y^2 + 7y + 3}} = \sqrt{\frac{6}{5}};$$

$$(k) \lim_{h \rightarrow 5} \frac{h}{\sqrt{5+h} - \sqrt{5}} = \sqrt{10} + \sqrt{5};$$

$$(l) \lim_{h \rightarrow 0} \frac{\sqrt{3+3h} - \sqrt{3}}{h} = \frac{\sqrt{3}}{2};$$

$$(m) \lim_{x \rightarrow 2} \frac{x^4 - 16}{x - 2} = 32;$$

$$(n) \lim_{x \rightarrow 1} \frac{x - 1}{x^2 - 1} = \frac{1}{2}.$$