

Utilizando a idéia intuitiva de limite, calcule

$$a) \lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$$

$$b) \lim_{x \rightarrow 0} \frac{x^2 + x}{x}$$

$$c) \lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{x - 1}$$

$$d) \lim_{x \rightarrow 2} \frac{x^2 - 4x + 4}{x - 2}$$

$$e) \lim_{x \rightarrow -1} \frac{x^2 - 1}{x + 1}$$

$$f) \lim_{x \rightarrow 0} \sin x$$

Calcule  $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$  sendo  $f$  dada por

$$a) f(x) = x^2$$

$$b) f(x) = 2x^2 + x$$

$$c) f(x) = 5$$

$$d) f(x) = -x^3 + 2x$$

$$e) f(x) = \frac{1}{x}$$

$$f) f(x) = 3x + 1$$

Calcule.

$$a) \lim_{x \rightarrow -1} \frac{x^3 + 1}{x^2 - 1}$$

$$b) \lim_{x \rightarrow 0} \frac{x^3 + x^2}{3x^3 + x^4 + x}$$

$$c) \lim_{h \rightarrow 0} (x^2 + 3xh)$$

$$d) \lim_{h \rightarrow 0} \frac{(x+h)^3 - x^3}{h}$$

$$e) \lim_{x \rightarrow 3} \frac{x^2 - 9}{x^2 + 9}$$

$$f) \lim_{x \rightarrow p} \frac{\sqrt[3]{x} - \sqrt[3]{p}}{x - p} \quad (p \neq 0)$$

$$g) \lim_{x \rightarrow p} \frac{\sqrt[4]{x} - \sqrt[4]{p}}{x - p} \quad (p \neq 0)$$

$$h) \lim_{x \rightarrow 2} \frac{x^3 - 5x^2 + 8x - 4}{x^4 - 5x - 6}$$

$$i) \lim_{x \rightarrow 1} \frac{x^3 - 1}{x^4 + 3x - 4}$$

$$j) \lim_{x \rightarrow 7} \frac{\sqrt{x} - \sqrt{7}}{\sqrt{x+7} - \sqrt{14}}$$

$$l) \lim_{x \rightarrow p} \frac{x^3 - p^3}{x - p}$$

$$m) \lim_{x \rightarrow p} \frac{x^4 - p^4}{x - p}$$

Calcule e justifique.

$$a) \lim_{x \rightarrow 2} x^2$$

$$c) \lim_{x \rightarrow -2} (4x + 1)$$

$$e) \lim_{x \rightarrow -9} 50$$

$$g) \lim_{x \rightarrow 4} \sqrt{x}$$

$$i) \lim_{x \rightarrow -8} \sqrt{5}$$

$$l) \lim_{x \rightarrow 3} \frac{x^2 - 9}{x + 3}$$

$$n) \lim_{x \rightarrow \frac{1}{2}} \frac{4x^2 - 1}{2x - 1}$$

$$p) \lim_{x \rightarrow -\frac{1}{3}} \frac{9x^2 - 1}{3x + 1}$$

$$r) \lim_{x \rightarrow 3} \frac{\sqrt[3]{x} - \sqrt[3]{3}}{x - 3}$$

$$t) \lim_{x \rightarrow 0} \frac{x^2 + 3x - 1}{x^2 + 2}$$

$$b) \lim_{x \rightarrow 1} (3x + 1)$$

$$d) \lim_{x \rightarrow 10} 5$$

$$f) \lim_{x \rightarrow -1} (-x^2 - 2x + 3)$$

$$h) \lim_{x \rightarrow -3} \sqrt[3]{x}$$

$$j) \lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$$

$$m) \lim_{x \rightarrow -1} \frac{x^2 - 9}{x - 3}$$

$$o) \lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{x - 1}$$

$$q) \lim_{x \rightarrow 3} \frac{\sqrt{x} - \sqrt{3}}{x - 3}$$

$$s) \lim_{x \rightarrow 2} \frac{\sqrt[4]{x} - \sqrt[4]{2}}{x - 2}$$

$$u) \lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{\sqrt{2x + 3} - \sqrt{5}}$$

Calcule.

$$a) \lim_{x \rightarrow 0} \frac{\operatorname{tg} x}{x}$$

$$c) \lim_{x \rightarrow 0} \frac{\operatorname{sen} 3x}{x}$$

$$e) \lim_{x \rightarrow 0} \frac{x^2}{\operatorname{sen} x}$$

$$g) \lim_{x \rightarrow 0} \frac{\operatorname{tg} 3x}{\operatorname{sen} 4x}$$

$$i) \lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - \operatorname{sen} x}{2x - \pi}$$

$$l) \lim_{x \rightarrow p} \frac{\operatorname{tg} (x - p)}{x^2 - p^2}, \quad p \neq 0$$

$$n) \lim_{x \rightarrow 0} \frac{\operatorname{sen} \left(x^2 + \frac{1}{x}\right) - \operatorname{sen} \frac{1}{x}}{x}$$

$$p) \lim_{x \rightarrow 0} \frac{x - \operatorname{tg} x}{x + \operatorname{tg} x}$$

$$b) \lim_{x \rightarrow 0} \frac{x}{\operatorname{sen} x}$$

$$d) \lim_{x \rightarrow \pi} \frac{\operatorname{sen} x}{x - \pi}$$

$$f) \lim_{x \rightarrow 0} \frac{3x^2}{\operatorname{tg} x \operatorname{sen} x}$$

$$h) \lim_{x \rightarrow 0} \frac{1 - \cos x}{x}$$

$$j) \lim_{x \rightarrow 0} x \operatorname{sen} \frac{1}{x}$$

$$m) \lim_{x \rightarrow p} \frac{\operatorname{sen} (x^2 - p^2)}{x - p}$$

$$o) \lim_{x \rightarrow 0} \frac{x + \operatorname{sen} x}{x^2 - \operatorname{sen} x}$$

$$q) \lim_{x \rightarrow 1} \frac{\operatorname{sen} \pi x}{x - 1}$$