

Lista 2 de Cálculo I
Data da entrega: 05/09/19

Exercício 1: Ache o limite:

13. $\lim_{t \rightarrow 2^+} \frac{t+2}{t^2-4}$

15. $\lim_{t \rightarrow 2^-} \frac{t+2}{t^2-4}$

17. $\lim_{x \rightarrow 0^-} \frac{\sqrt{3+x^2}}{x}$

19. $\lim_{x \rightarrow 3^+} \frac{\sqrt{x^2-9}}{x-3}$

21. $\lim_{x \rightarrow 0^+} \left(\frac{1}{x} - \frac{1}{x^2} \right)$

23. $\lim_{x \rightarrow 0^-} \frac{2-4x^3}{5x^2+3x^3}$

Resposta:

13. $+\infty$ 15. $-\infty$ 17. $-\infty$

19. $+\infty$ 21. $-\infty$ 23. $+\infty$

Exercício 2: Ache a(s) assíntota(s) vertical(is) do gráfico da função e faça um esboço dele.

35. $f(x) = \frac{2}{x-4}$

37. $f(x) = \frac{-2}{x+3}$

39. $f(x) = \frac{-2}{(x+3)^2}$

41. $f(x) = \frac{5}{x^2+8x+15}$

Respostas

35. $x = 4$ 37. $x = -3$ 39. $x = -3$ 41. $x = -5, x = -3$

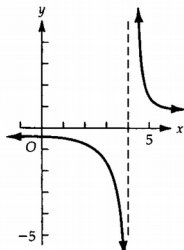


FIGURA 2.4-35

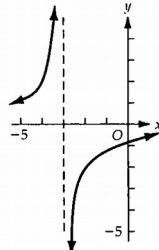


FIGURA 2.4-37

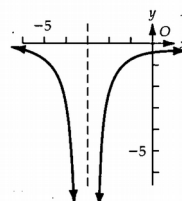


FIGURA 2.4-39

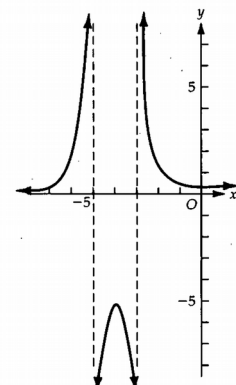


FIGURA 2.4-41

Exercício 3: Ache o limite.

11. $\lim_{t \rightarrow +\infty} \frac{2t + 1}{5t - 2}$

13. $\lim_{x \rightarrow -\infty} \frac{2x + 7}{4 - 5x}$

15. $\lim_{x \rightarrow +\infty} \frac{7x^2 - 2x + 1}{3x^2 + 8x + 5}$

17. $\lim_{x \rightarrow +\infty} \frac{x + 4}{3x^2 - 5}$

19. $\lim_{y \rightarrow +\infty} \frac{2y^2 - 3y}{y + 1}$

21. $\lim_{x \rightarrow -\infty} \frac{4x^3 + 2x^2 - 5}{8x^3 + x + 2}$

23. $\lim_{y \rightarrow +\infty} \frac{2y^3 - 4}{5y + 3}$

25. $\lim_{x \rightarrow -\infty} \left(3x + \frac{1}{x^2} \right)$

27. $\lim_{x \rightarrow +\infty} \frac{\sqrt{x^2 + 4}}{x + 4}$

29. $\lim_{w \rightarrow -\infty} \frac{\sqrt{w^2 - 2w + 3}}{w + 5}$

Resposta:

11. $\frac{2}{5}$ 13. $-\frac{2}{5}$ 15. $\frac{7}{3}$ 17. 0 19. $+\infty$ 21. $\frac{1}{2}$ 23. $+\infty$ 25. $-\infty$ 27. 1 29. -1

Exercício 4: Encontre as assíntotas horizontal e vertical e trace um esboço do gráfico da função.

37. $f(x) = \frac{2x + 1}{x - 3}$

39. $g(x) = 1 - \frac{1}{x}$

41. $f(x) = \frac{2}{\sqrt{x^2 - 4}}$

43. $G(x) = \frac{4x^2}{x^2 - 9}$

45. $h(x) = \frac{2x}{6x^2 + 11x - 10}$

47. $f(x) = \frac{4x^2}{\sqrt{x^2 - 2}}$

Resposta:

37. $y = 2, x = 3$ 39. $y = 1, x = 0$ 41. $y = 0, x = -2, x = 2$ 43. $y = 4, x = -3, x = 3$ 45. $y = 0, x = \frac{2}{3}, x = -\frac{5}{2}$
47. $x = -\sqrt{2}, x = \sqrt{2}$

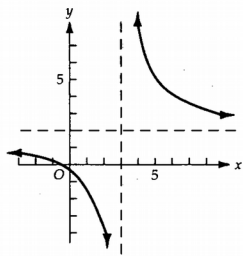


FIGURA 2.5-37

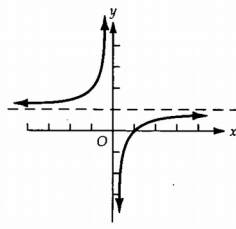


FIGURA 2.5-39

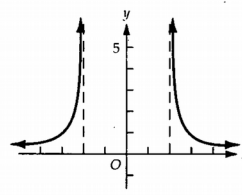


FIGURA 2.5-41

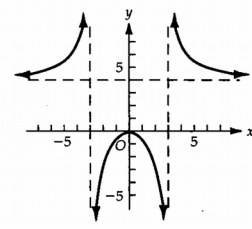


FIGURA 2.5-43

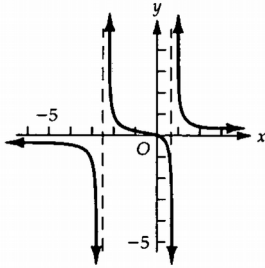


FIGURA 2.5-45

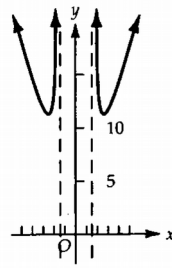


FIGURA 2.5-47

Exercício 5: Calcule o limite, quando ele existir.

1. $\lim_{x \rightarrow 0} \frac{\text{sen } 4x}{x}$

3. $\lim_{x \rightarrow 0} \frac{\text{sen } 9x}{\text{sen } 7x}$

5. $\lim_{y \rightarrow 0} \frac{3y}{\text{sen } 5y}$

7. $\lim_{x \rightarrow 0} \frac{x^2}{\text{sen}^2 3x}$

11. $\lim_{x \rightarrow 0} \frac{1 - \cos 4x}{x}$

13. $\lim_{x \rightarrow 0} \frac{3x^2}{1 - \cos^2 \frac{1}{2}x}$

15. $\lim_{x \rightarrow 0} \frac{\text{tg } x}{2x}$

17. $\lim_{t \rightarrow 0^+} \frac{\text{sen } t}{t^2}$

19. $\lim_{x \rightarrow 0} \frac{1 - \cos 2x}{\text{sen } 3x}$

Resposta:

1. 4 3. $\frac{9}{7}$ 5. $\frac{3}{5}$ 7. $\frac{1}{9}$ 9. 0 11. 0 13. 12 15. $\frac{1}{2}$ 17. $+\infty$ 19. 0

Exercício 6: Calcule.

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

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

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

g) $\lim_{x \rightarrow 0} (1 + 2x)^{\frac{1}{x}}$

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

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

f) $\lim_{x \rightarrow 0} (1 + 2x)^x$

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

Resposta:

a) e^2 b) e c) $e^{\frac{1}{2}}$ d) e^2 e) e f) 1 g) e^2 h) e^2