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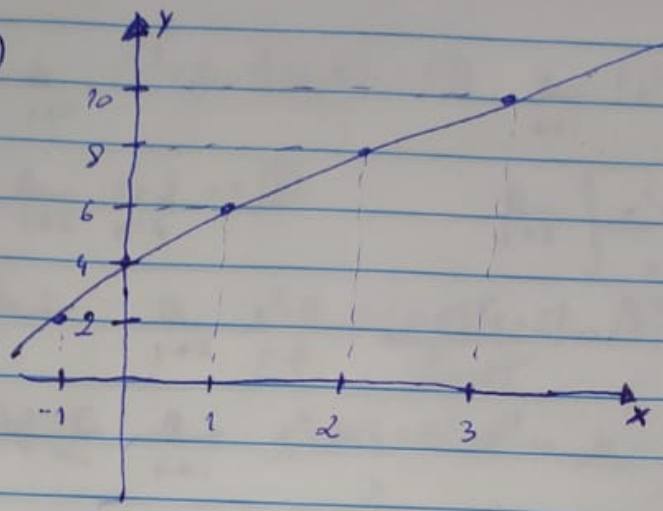
① ⓐ $\lim_{x \to 1} (2x+4)$

X	Y
-1	2
0	4
1	6
2	8
3	10

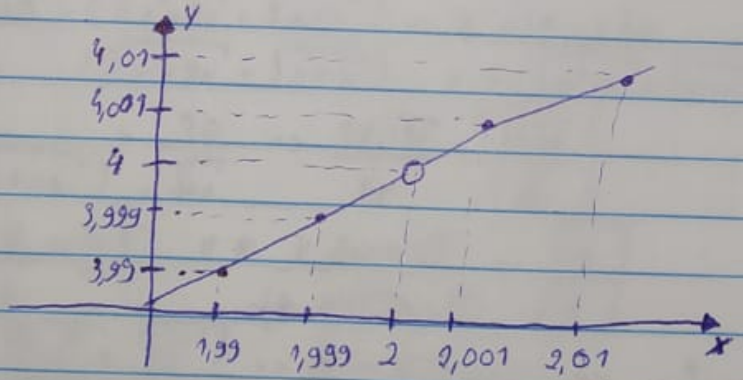


Quanto mais próximo de $f(1)$, mais próximo de 6 é o limite

ⓑ $\lim_{x \to 2} f(x)$

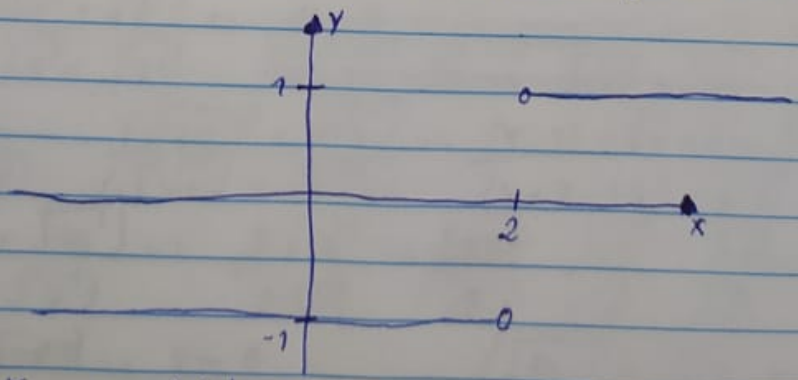
ⓐ $f(x) = \frac{x^2-4}{x-2}$ ⓑ $f(x) = \frac{|x-2|}{x-2}$ ⓒ $f(x) = \begin{cases} x^2, & x \neq 2 \\ 0, & x = 2 \end{cases}$

a- X	Y
1,99	3,99
1,999	3,999
2	indefinido
2,001	4,001
2,01	4,01



Quanto mais próximo de $f(2)$, mais próximo de 4 é o limite

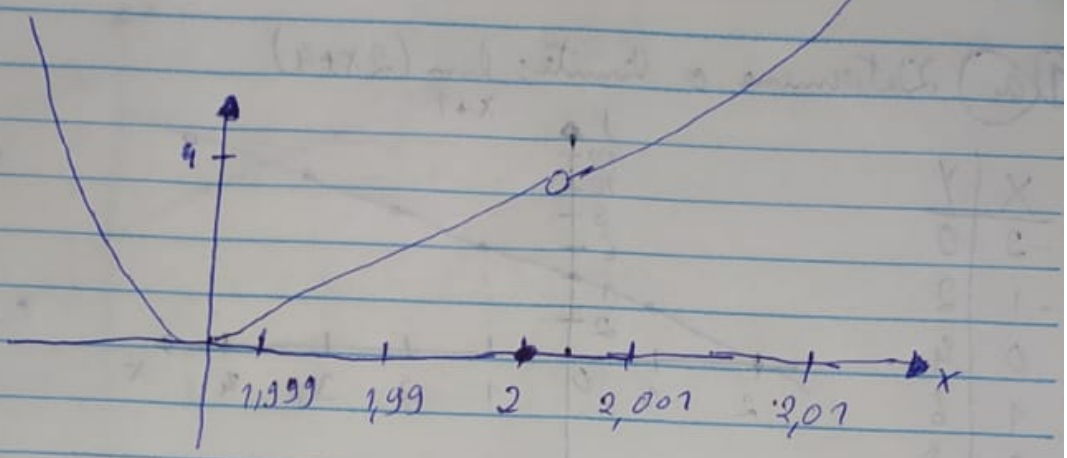
b- X	Y
1,99	-1
1,999	-1
2	indefinido
2,001	1
2,01	1



O limite para $f(2)$ não existe pois há valores diferentes de Y para $x > 2$ e $x < 2$.

c-

X	Y
1,999	3,996
1,99	3,96
2	0
2,001	4,004
2,01	4,04



Para f(2) o limite é 0 ou 4, não sei?

② a) $\lim_{x \to 1} 2x^2 - x + 4$

$2 \cdot 1 - 1 + 4 \Rightarrow 2 - 1 + 4 \Rightarrow 5$

Para f(1) o limite é 5

b) $\lim_{x \to 2} \frac{x^3 - 8}{x - 2}$

$x^3 - 8 \mid x - 2$

$-x^3 + 2x^2 \quad x^2 + 2x + 4$

$0 + 2x^2 - 8$

$-2x^2 + 4x$

$0 + 4x - 8$

$-4x + 8$

0

$4 + 4 + 4 \Rightarrow \boxed{12}$

O limite para f(2) é 12

c) $\lim_{x \to 3} \frac{x^2 + x - 12}{x - 3}$

$x^2 + x - 12 \mid x - 3$

$-x^2 + 3x \quad x + 4$

$4x - 12$

$-4x + 12$

0

$3 + 4 \Rightarrow \boxed{7}$

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3 1-) $6x^2 - 7x + 1$

$f(x) = 6x^2 - 7x + 1$

$\Delta = b^2 - 4ac$

$\Delta = 49 - 4.6.1$

$\Delta = 49 - 24$

$\Delta = 25$

$x = \frac{-b \pm \sqrt{\Delta}}{2a}$

$x = \frac{7 \pm \sqrt{25}}{2.6}$

$x = \frac{7 \pm 5}{12}$

$x' = \frac{12}{12} \Rightarrow x' = 1$

$x'' = \frac{2}{12} \Rightarrow x'' = \frac{1}{6}$

2-) $8x^2 - 2x - 1$

$f(x) = 8x^2 - 2x - 1$

$\Delta = b^2 - 4ac$

$\Delta = 4 - 4.8.(-1)$

$\Delta = 36$

$x = \frac{-b \pm \sqrt{\Delta}}{2a}$

$x = \frac{2 \pm \sqrt{36}}{2.8}$

$x = \frac{2 \pm 6}{16}$

$x' = \frac{8}{16} \Rightarrow x' = \frac{1}{2}$

$x'' = \frac{-4}{16} \Rightarrow x'' = -\frac{1}{4}$

3-) $4x^2 - 12x + 9$

$f(x) = 4x^2 - 12x + 9$

$\Delta = b^2 - 4ac$

$\Delta = 144 - 4.4.9$

$\Delta = 0$

$x = \frac{-b \pm \sqrt{\Delta}}{2a}$

$x = \frac{12 \pm \sqrt{0}}{2.4}$

$x = \frac{12}{8} \Rightarrow x = \frac{3}{2}$

4-) $9x^2 + 12x + 4$

$f(x) = 9x^2 + 12x + 4$

$\Delta = 144 - 4.9.4$

$\Delta = 0$

$x = \frac{-b \pm \sqrt{\Delta}}{2a}$

$x = \frac{-12 \pm 0}{2.9}$

$x = \frac{-12}{18} \Rightarrow x = -\frac{2}{3}$

5-) $y^2 + 4y + 1$

$f(y) = y^2 + 4y + 1$

$\Delta = b^2 - 4ac$

$\Delta = 16 - 4.1.1$

$\Delta = 12$

$y = \frac{-b \pm \sqrt{\Delta}}{2a}$

$y = \frac{-4 \pm \sqrt{12}}{2}$

$y = \frac{-4 \pm 2\sqrt{3}}{2}$

$y' = -2 + \sqrt{3}$

$y'' = -2 - \sqrt{3}$

6-) $y^2 + 5y - 2$

$f(y) = y^2 + 5y - 2$

$\Delta = b^2 - 4ac$

$\Delta = 25 - 4.1.(-2)$

$\Delta = 33$

$x = \frac{-b \pm \sqrt{\Delta}}{2a}$

$x = \frac{-5 \pm \sqrt{33}}{2}$

$y' = \frac{-5 + \sqrt{33}}{2}$

$y'' = \frac{-5 - \sqrt{33}}{2}$

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7-) $2x^2+3x-4$

$\Delta = b^2 - 4ac$

$\Delta = 9 - 4.2.(-4)$

$\Delta = 41$

$x = \frac{-b \pm \sqrt{\Delta}}{2a}$

$x = \frac{-3 \pm \sqrt{41}}{2.2}$

$\boxed{x' = \frac{-3+\sqrt{41}}{4}}$

$\boxed{x'' = \frac{-3-\sqrt{41}}{4}}$

8-) $3x^2-8x-4$

$\Delta = b^2 - 4ac$

$\Delta = 64 - 4.3.(-4)$

$\Delta = 112$

$x = \frac{-b \pm \sqrt{\Delta}}{2a}$ $\quad x = \frac{8 \pm 4\sqrt{7}}{2.3}$

$x = \frac{8 \pm \sqrt{112}}{2.3}$ $\quad x = \frac{4 \pm 2\sqrt{7}}{3}$

$\boxed{x' = \frac{2(2+\sqrt{7})}{3}}$ $\quad \boxed{x'' = \frac{2(2-\sqrt{7})}{3}}$

61-) $x^3 - 3x^2 - 6x - 2 = (x+1)(?) \Rightarrow (x+1)(x^2-4x-2)$

$x^3 - 3x^2 - 6x - 2 \;|\; x+1$

$-x^3 - x^2 \qquad x^2 - 4x - 2$

$-4x^2 - 6x - 2$

$+4x^2 + 4x$

$-2x - 2$

$+2x + 2$

0

62-) $x^3 - 2x^2 - x + 2 = (x-2)(?) \Rightarrow (x-2).(x^2-1)$

$x^3 - 2x^2 - x + 2 \;|\; x-2$

$-x^3 + 2x^2 \qquad x^2 - 1$

$-x + 2$

$+x - 2$

0

63-) $2x^3 - x^2 - 2x + 1 = (x+1).(?) \Rightarrow (x+1).(2x^2 - 3x + 1)$

$2x^3 - x^2 - 2x + 1 \;|\; x+1$

$-2x^3 - 2x^2$ $\qquad 2x^2 - 3x + 1$

$-3x^2 - 2x + 1$

$+3x^2 + 3x$

$x + 1$

$-x - 1$

0

64-) $x^4 - 16x^3 + 96x^2 - 256x + 256 = (x-4).(?)$

$x^4 - 16x^3 + 96x^2 - 256x + 256 \;|\; x-4$

$-x^4 + 4x^3$ $\qquad x^3 - 12x^2 + 48x - 64$

$-12x^3 + 96x^2 - 256x + 256$

$+12x^3 - 48x^2$ $\qquad (x-4).(x^3 - 12x^2 + 48x - 64)$

$+48x^2 - 256x + 256$

$-48x^2 + 192x$

$-64x + 256$

$+64x - 256$

(4) 1-) $\lim_{x \to 2} 2x + 5$

x	1,9	1,99	1,999	2	2,001	2,01	2,1
f(x)	8,8	8,98	8,998	9	9,002	9,02	9,2

3-) $\lim_{x \to 2} \frac{x-2}{x^2-4}$

x	1,9	1,99	1,999	2	2,001	2,01	2,1
f(x)	0,256	0,25	0,25	?	0,249	0,249	0,243

5-) $\lim_{x \to 0} \frac{\sqrt{x+1} - 1}{x}$

x	-0,1	-0,09	-0,001	0	0,001	0,01	0,1
f(x)	0,513	0,501	0,5	?	0,499	0,498	0,488

7-) $\lim_{x \to 0^-} \frac{\frac{1}{x+4} - \frac{1}{4}}{x}$

x	-0,5	-0,1	-0,01	-0,001	0
f(x)	-0,071	-0,064	-0,062	-0,062	?

9-) (a) $\lim_{x \to 0} f(x) \to 1$

(b) $\lim_{x \to -1} f(x) = 3$

11-) (a) $\lim_{x \to 0} g(x) = 1$

(b) $\lim_{x \to -1} g(x) = 3$

13-) (a) $f(x) = 3$
$g(x) = 9$
$f(x) + g(x) = 12$

(b) $f(x) = 3$
$g(x) = 9$
$f(x) \cdot g(x) = 27$

(c) $f(x) = 3$
$g(x) = 9$
$\frac{f(x)}{g(x)} = \frac{1}{3}$

15-) $\lim_{x \to c} f(x) = 16$

(a) $\sqrt{f(x)} = 4$

(b) $[3f(x)] = 48$

(c) $[f(x)]^2 = 256$

17-) (a) $\lim_{x \to 3^+} f(x) = 1$

(b) $\lim_{x \to 3^-} f(x) = -2$

(c) $\lim_{x \to c} f(x) = 1$

19-) (a) $\lim_{x \to 3^+} f(x) = 1$

(b) $\lim_{x \to 3^-} f(x) =$

(c) $\lim_{x \to c} f(x) = 1$

21-) (a) $\lim_{x \to 3^+} f(x) =$ indefinido

(b) $\lim_{x \to 3^-} f(x) = 3$

(c) $\lim_{x \to 3} f(x) =$ indefinido

23-) $\lim_{x \to 2} x^2 \to 4$

25-) $\lim_{x \to -3} (2x+5) \to -1$

27-) $\lim_{x \to 1} (1 - x^2) \to 0$

29-) $\lim_{x \to 3} \sqrt{x+6} \to 3$

31-) $\lim_{x \to -3} \frac{2}{x+2} \to -2$

33-) $\lim_{x \to -2} \frac{x^2 - 1}{2x} \to (-0,75)$

35-) $\lim_{x \to 7} \frac{5x}{x+2} \to 3,888...$

37-) $\lim_{x \to 3} \frac{\sqrt{x+1} - 1}{x} \to 0,333...$

39-) $\lim_{x \to 1} \frac{\frac{1}{x+9} - \frac{1}{9}}{x} \to -0,05$

41-) $\lim_{x\to 1} \frac{x^2-1}{x-1} \to \frac{(x-1)(x+1)}{(x-1)} \Rightarrow \boxed{2}$

43-) $\lim_{x\to 2} \frac{x-2}{x^2-4x+4} \to \frac{x-2}{(x-2)^2} \Rightarrow \frac{1}{x-2} \Rightarrow \boxed{0}$

45-) $\lim_{t\to 4} \frac{t+4}{t^2-16} \to \frac{(t+4)}{(t-4)(t+4)} \Rightarrow \frac{1}{t-4} \Rightarrow \boxed{0}$

47-) $\lim_{x\to -2} \frac{x^3+8}{x+2} \to \frac{(x+2)(x^2-2x+4)}{(x+2)} \Rightarrow x^2-2x+4 \Rightarrow \boxed{12}$

49-) $\lim_{x\to -2} \frac{|x+2|}{x+2}$ → Limite não existe

(5) 2-) $\lim_{x\to 2} (x^2-3x+1)$

x	1,9	1,99	1,999	2	2,001	2,01	2,1
f(x)	-1,09	-1,009	-1,0009	-1	-0,99	-0,98	-0,89

4-) $\lim_{x\to 2} \frac{x-2}{x^2-3x+2}$

x	1,9	1,99	1,999	2	2,001	2,01	2,1
f(x)	1,11	1,01	1,001	?	0,999	0,99	0,9

6-) $\lim_{x\to 0} \frac{\sqrt{x+2}-\sqrt{2}}{x}$

x	-0,1	-0,01	-0,001	0	0,0001	0,01	0,1
f(x)	0,358	0,353	0,353	?	0,353	0,353	0,349

8-) $\lim_{x\to 0^+} \frac{\frac{1}{2+x}-\frac{1}{2}}{2x}$

x	0,5	0,1	0,01	0,001	0
f(x)	-0,1	-0,11	-0,12	-0,12	?

10-) (a) $\lim_{x\to 1} f(x) \Rightarrow \boxed{-2}$

(b) $\lim_{x\to 3} f(x) \Rightarrow \boxed{0}$

12-) (a) $\lim_{x\to -2} h(x) \Rightarrow \boxed{-5}$

(b) $\lim_{x\to 0} h(x) \Rightarrow \boxed{-3}$

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14-) ⓐ $f(x) = 3/2$ $g(x) = 1/2$ $f(x) + g(x) \neq 2$

ⓑ $f(x) = 3/2$ $g(x) = 1/2$ $f(x) \cdot g(x) = 3/4$

ⓒ $f(x) = 3/2$ $g(x) = 1/2$ $f(x)/g(x) = 3$

16-) $\lim_{x \to c} f(x) = 9$

ⓐ $\sqrt{f(x)} = 3$ ⓑ $[3f(x)] = 27$ ⓒ $[f(x)]^2 = 81$

18-) ⓐ $\lim_{x \to 2^+} f(x) = -2$ ⓑ $\lim_{x \to -2^-} f(x) = -2$ ⓒ $\lim_{x \to -2} f(x) = -2$

20-) ⓐ $\lim_{x \to 2^+} f(x) = -2$ ⓑ $\lim_{x \to -2^-} f(x) = 3$ ⓒ $\lim_{x \to -2} f(x) = 3$

22-) ⓐ $\lim_{x \to 1^+} f(x) = 3/2$ ⓑ $\lim_{x \to -1^-} f(x) \neq$ indefinido ⓒ $\lim_{x \to -1} f(x) =$ indefinido

24-) $\lim_{x \to -2} x^3 \Rightarrow -8$

26-) $\lim_{x \to 0} (3x - 2) = -2$

28-) $\lim_{x \to 2} (-x^2 + x - 2) = -4$

30-) $\lim_{x \to 4} \sqrt[3]{x+4} \Rightarrow 2$

32-) $\lim_{x \to -2} \frac{3x+1}{2-x} \Rightarrow \frac{-5}{4}$

34-) $\lim_{x \to -1} \frac{4x-5}{3-x}$

36-) $\lim_{x \to 3} \frac{\sqrt{x+1}}{x-4} \Rightarrow -2$

38-) $\lim_{x \to 5} \frac{\sqrt{x+4} - 2}{x} \Rightarrow \frac{1}{5}$

40-) $\lim_{x \to 2} \frac{\frac{1}{x+2} - \frac{1}{2}}{x} = \frac{-1}{8}$

42-) $\lim_{x \to -1} \frac{2x^2 - x - 3}{x+1} \to \frac{(x+1)(2x-3)}{(x+1)} \Rightarrow -5$

44-) $\lim_{x \to 2} \frac{2-x}{x^2-4} \to \frac{(2-x)}{(2+x)(x-2)} \Rightarrow \frac{-1}{4}$

46-) $\lim_{t \to 1} \frac{t^2 + t - 2}{t^2 - 1} \to 1,5$

48-) $\lim_{x \to -1} \frac{x^3 - 1}{x+1} \to$ Limite indefinido

50-) $\lim_{x \to 2} \frac{|x-2|}{x-2} \to$ Limite indefinido