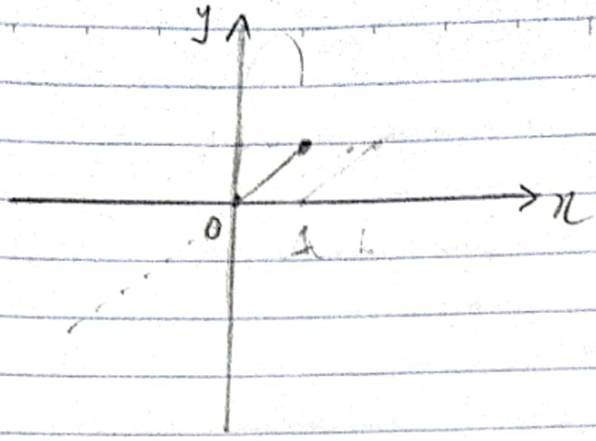
data

1.a)

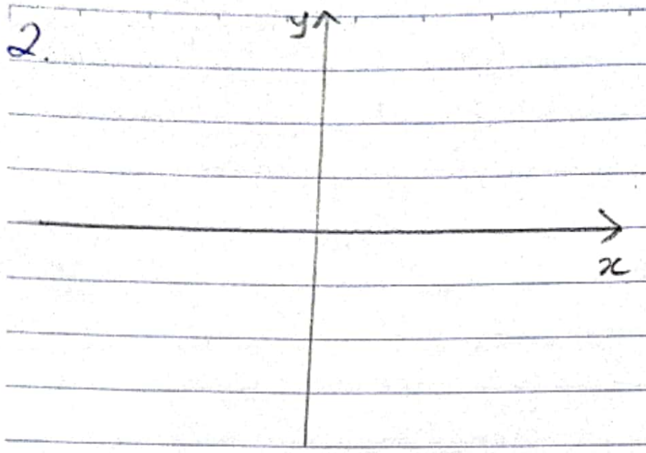


Falsa, caso $g(x) = 0$ teremos uma indetermi-
nação

b) $\lim_{x \to 5/8} \frac{(4x^2+5x-1)}{-x+(5/8)} = \frac{4x^2+5x-1}{-x+\frac{5}{8}}$

$\Delta = 25 +$

2.



$$\begin{cases} \dfrac{\text{sen}(3x)}{x}, & \text{se } x < 0 \\ \dfrac{x+6}{x+2}, & \text{se } x > 0 \end{cases}$$

$$\lim_{x \to 0^-} \frac{\text{sen } 3x}{x} = \lim_{x \to 0^-} \frac{3 \cdot \text{sen } 3x}{3x} = 3 \lim_{x \to 0^-} \frac{\text{sen } 3x}{3x}$$

$$3 \cdot 1 = 3$$

$$\lim_{x \to 0^+} \frac{x+6}{x+2} = \frac{6}{2} = 3$$

$$f(x) = \begin{cases} \dfrac{\text{sen}(3x)}{x}, & \text{se } x < 0 \\ 3, & \text{se } x = 0 \\ \dfrac{x+6}{x+2}, & \text{se } x > 0 \end{cases}$$

data . .
S T Q Q S S D

3- a) $f(x)=\dfrac{x^3 \operatorname{sen}(x)}{3x^4+2x^2-10}$ $\qquad -1 \leq \operatorname{sen}(x) \leq 1$

$$\lim_{x\to+\infty} \dfrac{\dfrac{x^3\cdot \operatorname{sen}(x)}{x^4}}{\dfrac{3x^4+2x^2-10}{x^4}} \Rightarrow \dfrac{\dfrac{\operatorname{sen}(x)}{x}}{3+\dfrac{2}{x^2}-\dfrac{10}{x^4}} = \dfrac{0}{3}=0$$

$$* \ \dfrac{-1}{x} \leq \dfrac{\operatorname{sen}(x)}{x} \leq \dfrac{1}{x} = \lim_{x\to+\infty} \dfrac{-1}{x} = 0 \ \Big| \ \lim_{x\to+\infty} \dfrac{1}{x} = 0$$

$$* \ 0 \leq \lim_{x\to+\infty} \dfrac{\operatorname{sen}(x)}{x} \leq 0$$

$$\lim_{x\to-\infty} \dfrac{\dfrac{x^3\cdot \operatorname{sen}(x)}{x^4}}{\dfrac{3x^4+2x^2-10}{x^4}} \Rightarrow \dfrac{\dfrac{\operatorname{sen}(x)}{x}}{3+\dfrac{2}{x^2}-\dfrac{10}{x^4}} = \dfrac{0}{3} = 0$$

as assintotas horizontais da função é $y=0$

data

3b. $6x - 3x^2 = 3 \Rightarrow -3x^2 + 6x - 3 = 0$

$\Delta = 36 - 36$ $\qquad$ $\frac{-6}{-6} = 1$

$\Delta = 0$

$$\lim_{x \to 1^+} \frac{1 - x}{\sqrt{3} - \sqrt{6x - 3x^2}} \cdot \frac{(\sqrt{3} + \sqrt{6x - 3x^2})}{(\sqrt{3} + \sqrt{6x - 3x^2})} \Rightarrow$$

$$\lim_{x \to 1^+} \frac{(1 - x)(\sqrt{3} + \sqrt{6x - 3x^2})}{(\sqrt{3})^2 - (\sqrt{6x - 3x^2})^2} \Rightarrow$$

$$\lim_{x \to 1^+} \frac{(1 - x)(\sqrt{3} + \sqrt{6x - 3x^2})}{3 - 6x + 3x^2}$$

$$\lim_{x \to 1^+} \frac{(1 - x)(\sqrt{3} + \sqrt{6x - 3x^2})}{3(1 - 2x + x^2)} \Rightarrow \frac{(1 - x) \cdot (\sqrt{3} + \sqrt{6x - 3x^2})}{3 \cdot (1 - x)^2}$$

$$\lim_{x \to 1^+} \frac{\sqrt{3} + \sqrt{6x - 3x^2}}{3 \cdot (1 - x)} \Rightarrow \frac{\sqrt{3} + \sqrt{3}}{0^-} = \frac{2\sqrt{3}}{0^-} = -\infty$$

data . .

S T Q Q S S D

4-b) $\lim_{x\to+\infty} \ln\left(\left(\frac{2x-1}{2x+1}\right)^{x}\right) \Rightarrow 2x = t$

$* \left(\frac{\frac{t-1}{t}}{\frac{t+1}{t}}\right)^{\frac{t}{2}} \Rightarrow \left(\frac{1-\frac{1}{t}}{1+\frac{1}{t}}\right)^{\frac{t}{2}} = \left(\left(\frac{1-\frac{1}{t}}{1+\frac{1}{t}}\right)^{t}\right)^{\frac{1}{2}} \Rightarrow$

$\left(\frac{\left(1-\frac{1}{t}\right)^{t}}{\left(1+\frac{1}{t}\right)^{t}}\right)^{\frac{1}{2}} \Rightarrow \quad * \ \frac{-1}{t} = \frac{1}{m} \Rightarrow$

$\ln \lim_{t\to+\infty} \left(\frac{\left(1-\frac{1}{t}\right)^{t}}{\left(1+\frac{1}{t}\right)^{t}}\right)^{\frac{1}{2}} = \ln\left(\frac{\lim_{t\to+\infty}\left(1-\frac{1}{t}\right)^{t}}{\lim_{t\to+\infty}\left(1+\frac{1}{t}\right)^{t}}\right)$

$* \left(1-\frac{1}{t}\right)^{t} \Rightarrow \left(1+\frac{1}{m}\right)^{-m} = \left(\left(1+\frac{1}{m}\right)^{m}\right)^{-1}$

$\ln\left(\frac{\lim_{m\to-\infty}\left(\left(1+\frac{1}{m}\right)^{m}\right)^{-1}}{\lim_{t\to+\infty}\left(1+\frac{1}{t}\right)^{t}}\right)^{\frac{1}{2}} \Rightarrow \ln\left(\frac{(e)^{-1}}{e}\right)^{\frac{1}{2}} =$

$\ln\left(e^{-2}\right)^{\frac{1}{2}} = \underline{\ln e^{-1}}$

4.a)