data

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3c, $f(x) \frac{1}{x+2} \Rightarrow f(x+\Delta x) = \frac{1}{(x+\Delta x)+2} = \frac{1}{x+\Delta x+2}$

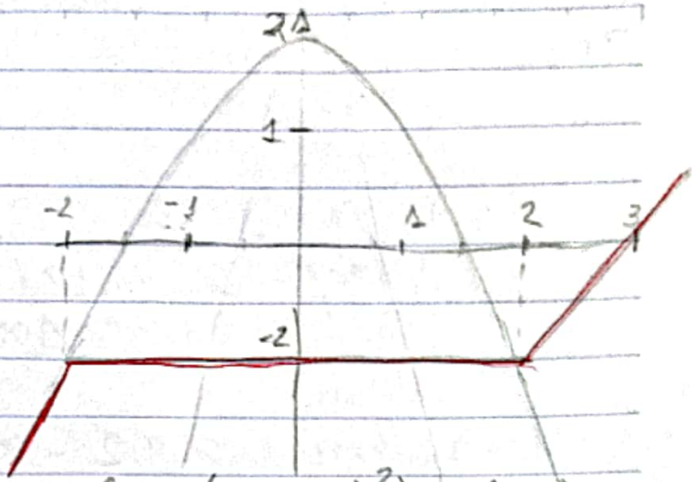
$$f'(x) = \lim_{\Delta x \to 0} \frac{\frac{1}{x+\Delta x+2} - \frac{1}{x+2}}{\Delta x} \Rightarrow \frac{x+2-(x+\Delta x+2)}{(x+\Delta x+2)(x+2)} \Rightarrow$$

$$f'(x) = \lim_{\Delta x \to 0} \frac{\frac{\cancel{x}+\cancel{2}-\cancel{x}-\Delta x-\cancel{2}}{(x+\Delta x+2)(x+2)}}{\Delta x} \Rightarrow \frac{\frac{-\Delta x}{(x+\Delta x+2)(x+2)}}{\Delta x}$$

$$f'(x) = \lim_{\Delta x \to 0} \frac{-\cancel{\Delta x}}{(x+\Delta x+2)(x+2)} \cdot \frac{1}{\cancel{\Delta x}} = \frac{-1}{(x+0+2)(x+2)}$$

$$f'(x) = -\frac{1}{(x+2)\cdot(x+2)} = -\frac{1}{(x+2)^2}$$

9c, $f(x) = \begin{cases} 2 - x^2, & x < -2 \\ -2, & |x| \leq 2 \\ 2x - 6, & x > 2 \end{cases}$



$$f'_-(-2) = \lim_{\Delta x \to 0} \frac{(x+\Delta x)-(f(x)}{\Delta x} \Rightarrow \frac{(2-(-2+\Delta x)^2)-(-2)}{\Delta x}$$

$$f'_-(-2) = \lim_{\Delta x \to 0} \frac{(2-(4-4\Delta x+(\Delta x)^2)+2}{\Delta x} \Rightarrow$$

$$f'_-(-2) = \lim_{\Delta x \to 0} \frac{(2-4+4\Delta x-(\Delta x)^2)+2}{\Delta x} \Rightarrow$$

$$f'_-(-2) = \lim_{\Delta x \to 0} \frac{2-4+4\Delta x-(\Delta x)^2+2}{\Delta x} = \frac{4\Delta x-(\Delta x)^2}{\Delta x}$$

$$f'_-(-2) = \lim_{\Delta x \to 0} \frac{4\Delta x-(\Delta x)^2}{\Delta x} = \lim_{\Delta x \to 0} \frac{\cancel{\Delta x}(4-\Delta x)}{\cancel{\Delta x}} = 4-\Delta x$$

$$f'_-(-2) = \underline{\underline{4}}$$

data

9c. $f(x) = \begin{cases} 2-x^2, & x<-2 \\ -2, & |x| \le 2 \\ 2x-6, & x>2 \end{cases}$ *

$$f'_+(-2) = \lim_{\Delta x \to 0} \frac{(x+\Delta x)-(-2)}{\Delta x} = \lim_{\Delta x \to 0} \frac{-2-(-2)}{\Delta x} = 0$$

$$f'_-(2) = \lim_{\Delta x \to 0} \frac{-2-(-2)}{\Delta x} = 0$$

$$f(2) = 2 \cdot 2 - 6 = \underline{-2}$$

$$f(2+\Delta x) = 2 \cdot (2+\Delta x) - 6 = 4 + 2\Delta x - 6 = \underline{2\Delta x - 2}$$

$$f'_+(2) = \lim_{\Delta x \to 0} \frac{2\Delta x - 2 - (-2)}{\Delta x} \Rightarrow \frac{2\Delta x}{\Delta x} = 2$$

data . .

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$$18x)\ f(x) = \ln\left(\frac{\text{arc sen}(x)}{\text{arc cos}(x)}\right) \Rightarrow \frac{\text{arc sen}(x)}{\text{arc cos}(x)} = u$$

$$h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

$$\text{arc sen}(x) = \frac{1}{\sqrt{1-x^2}}$$

$$\text{arc cos}(x) = \frac{-1}{\sqrt{1-x^2}}$$

$$h'(u) = \frac{\frac{1}{\sqrt{1-x^2}} \cdot \text{arc cos}\, x - \text{arc sen}(x) \cdot \frac{-1}{\sqrt{1-x^2}}}{\text{arc cos}^2(x)}$$

$$h'(u) = \frac{\frac{1}{\sqrt{1-x^2}} \cdot \left(\text{arc cos}\, x - \text{arc sen}(x) \cdot -1\right)}{\text{arc cos}^2(x)}$$

$$\frac{df}{du} = \frac{df}{du} \cdot \frac{du}{dx}$$

$$\frac{df}{du} = \frac{1}{\sqrt{1-x^2}} \cdot \left(\frac{\text{arc cos}\, x + \text{arc sen}(x)}{\text{arc cos}^2(x)}\right) \cdot \frac{1}{\frac{\text{arc sen}(x)}{\text{arc cos}(x)}}$$

$$\frac{df}{du} = \frac{1}{\sqrt{1-x^2}} \cdot \frac{\text{arc cos}(x) + \text{arc sen}(x)}{\text{arc cos}^2(x)} \cdot \frac{\text{arc cos}(x)}{\text{arc sen}(x)}$$

$$\frac{df}{du} = \frac{\text{arc cos}(x) + \text{arc sen}(x)}{\sqrt{1-x^2}\,(\text{arc cos}(x))(\text{arc sen}(x))}$$

35 $6x^2 + 3xy + 2y^2 + 17y - 6 = 0;\ (-1, 0)$

$y' = \frac{dy}{dx}$

$\frac{d}{dx}(6x^2) + \frac{d}{dx}(3xy) + \frac{d}{dx}(2y^2) + \frac{d}{dx}(17y) - \frac{d}{dx}(6) = \frac{d}{dx}(0)$

$* \frac{d}{dx}(3xy) = 3 \cdot y + 3x \cdot \frac{dy}{dx}$

$* \frac{d}{dx} 2y^2 = 2 \cdot 2 \cdot y \cdot y' = 4y \cdot \frac{dy}{dx}$

$* \frac{d}{dx} 17y = 17 \frac{dy}{dx}$

$12x + 3y + 3x\frac{dy}{dx} + 4y \cdot \frac{dy}{dx} + 17\frac{dy}{dx} + 0 = 0$

$12x + 3y + \frac{dy}{dx}\left(3x + 4y + 17\right) = 0$

$\frac{dy}{dx}\left(3x + 4y + 17\right) = -12x - 3y \Rightarrow \frac{-12x - 3y}{3x + 4y + 17} = \frac{12}{14} = \frac{6}{7}$

$y - y_0 = m(x - x_0) \Rightarrow y = m(x - x_0) + y_0$

$y = \frac{6}{7}(x + 1) + 0$

$y = \frac{6}{7}x + \frac{6}{7}$ e $m_n = -\frac{7}{6}$ (inverso do oposto)

$y = -\frac{7}{6}(x + 1) = -\frac{7}{6}x - \frac{7}{6}$