

Victor Ramos

Lista da Semana 8

$$1) f'(1) = \lim_{x \rightarrow 1} \frac{f(x) - f(1)}{x - 1} \Rightarrow \frac{(x^2 + x + 5) - 7}{x - 1} = \frac{x^2 + x - 2}{x - 1}$$

$$\Delta = 1 + 9$$

$$\Delta = 10$$

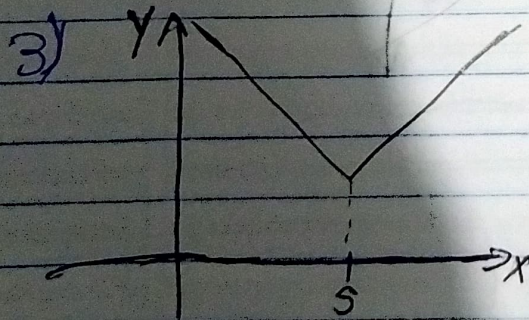
$$\Rightarrow \frac{(x-1) \cdot (x+2)}{x-1}$$

$$x = \frac{-1 \pm 3}{2} \begin{matrix} \nearrow 1 \\ \searrow -2 \end{matrix}$$

$$\Rightarrow \lim_{x \rightarrow 1} \frac{x+2}{1} = 3$$

$$2) f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} = \frac{10(x+h) - 10x}{h} = \frac{10x + 10h - 10x}{h} =$$

$$= \frac{10h}{h} = 10$$



4) a) $f'(x) = 0$

b) $f'(x) = 1$

c) $f'(x) = 5x^4$

d) $f'(x) = -5x^6$

e) $f(x) = x^3 \Rightarrow f'(x) = 3x^2$

f) $f(x) = x^{-8} \Rightarrow f'(x) = -8x^{-9}$

g) $f(x) = x^{\frac{1}{4}} \Rightarrow f'(x) = \frac{1}{4}x^{-\frac{3}{4}}$

h) $f(x) = x^{\frac{2}{3}} \Rightarrow f'(x) = \frac{2}{3}x^{-\frac{1}{3}}$

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

$f'(3) = 2 \cdot 3 = 6$

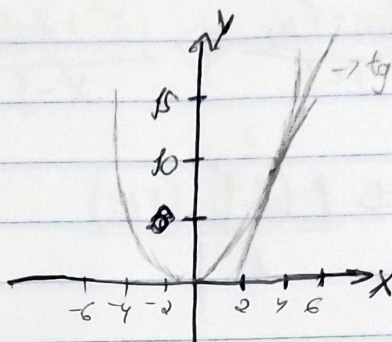
$f(3) = 9$

$y - y_0 = m(x - x_0)$

$y - 9 = 6(x - 3)$

$y - 9 = 6x - 18$

$y = 6x - 9$



6) $f(x) = 1$

$f'(x) = 0$

7) $f(x) = \ln x = 0$

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

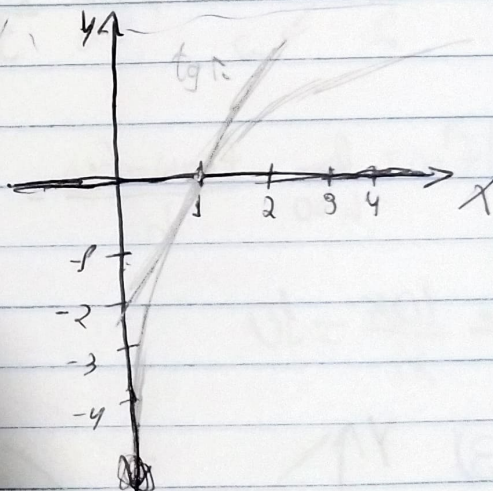
$y - 0 = 1(x - 1)$

$y = x - 1$

$y - 1 = 0(x - 0)$

$y - 1 = 1$

$y = x + 1$



8) $f(x) = 1$

$f'(x) = -\sin x = 0$

9) $f(x) = \sqrt{3}$

$f'(x) = \sec^2 x$

$f'(\frac{\pi}{3}) = \frac{1}{\cos^2 \frac{\pi}{3}} = \frac{1}{(\frac{1}{2})^2} = 4$

$y - 1 = 0(x - 0)$

$y = 1$

$y - \sqrt{3} = 4(x - \frac{\pi}{3})$

$y - \sqrt{3} = 4x - \frac{4\pi}{3}$

$y = 4x - \frac{4\pi}{3} + \sqrt{3}$