Prova 2 Calc 1 Henie Camargo GRR20203959

1) $f(x) = \begin{cases} x^2 & \text{se } x \leq 20 \\ mx+b & \text{se } x > 20 \end{cases}$

$\lim_{x \to 20} x^2 = 20^2 = 400$ Para ser derivável os limites laterais devem ser iguais

$\lim_{x \to 20^+} mx+b = 400$ Para ser derivável

$mx + b = 400$

$20m + b = 400$

$m = \underline{400 - b}$

A única que corresponde é $m = 40$ e $b = -400$

3) $h'(1) = f'(1) \cdot g(1) + f(1) \cdot g'(1)$ 30

$2 = f'(1) \cdot g(1) + -7 \cdot 2$

$f'(1) \cdot g(1) = 2 + 14$

$f'(1) = 16$

$g(x) = \dfrac{h(x)}{f(x)}$

$g(1) = \dfrac{h(1)}{f(1)} = \dfrac{-7}{-7} = 1$

2) $25x^2 + 36y^2 = 288$

$x = \dfrac{12}{5}$

$25 \cdot \left(\dfrac{12}{5}\right)^2 + 36y^2 = 288 \to 25 \cdot \dfrac{144}{25} + 36y^2 = 288$

$144 + 36y^2 = 288 \to 36y^2 = 288 - 144 \to 36y^2 = 144 \to y^2 = 4$

$y = \pm 2$ $y = -2$

$y = +2$

6)

Parcial: $\dfrac{d}{dx}\left(\dfrac{x^2}{48}\right) = \dfrac{x}{24}$

$\dfrac{d}{dy}\left(\dfrac{x^2}{48}\right) = 0$

Implícita $\dfrac{dx(y)}{dy} = \dfrac{24}{x}$

$\dfrac{dy(x)}{dx} = \dfrac{x}{24}$

7) $f(x) = 4x^2 + 7x$

$f'(x) = \dfrac{d}{dx}(4x^2 + 7x)$

$f'(x) = \dfrac{d}{dx}(4x^2) + \dfrac{d}{dx}(7x)$

$f'(x) = 4 \cdot 2x + 7$

$f'(x) = 8x + 7$

$dy = 8x + 7$

$dx = 4x^3$

$\dfrac{dy}{dx} = 4x^3(8x+7)$

4) $\lim_{x\to0}\left(\frac{\cos(5x)-1}{4x^2}\right) \Rightarrow \lim_{x\to0}\left(\frac{\frac{d}{dx}(\cos(5x)-1)}{\frac{d}{dx}(4x^2)}\right) \Rightarrow \lim_{x\to0}\left(\frac{-5\,sen(5x)}{8x}\right)$

$\lim_{x\to0}\left(\frac{5\,sen(5x)}{8x}\right) \to -\frac{25\cos(5\cdot0)}{8} \to -\frac{25}{8}$ 3,125 //

5) $f(x)=\ln(800x^2+7200) \Rightarrow f'(x)=\frac{d}{dx}\left(\ln(800x^2+7200)\right)$

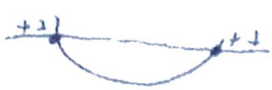
$f'(x)=\frac{d}{dG}(\ln(g))\cdot\frac{d}{dx}(800x^2+7200) \Rightarrow f(x)=\frac{1}{G}\cdot800\cdot2x \Rightarrow f(x)=\frac{1}{800x^2+7200}\cdot800\cdot2x$

$f'(x)=\frac{2x}{x^2+9} \Rightarrow f''(x)=\frac{d}{dx}\left(\frac{2x}{x^2+9}\right) \Rightarrow f'(x)\ \frac{\frac{d}{dx}(2x)\cdot(x^2+9)-2x\cdot\frac{d}{dx}(x^2+9)}{(x^2+9)^2}$

$f'(x)=\frac{2(x^2+9)-2x\cdot2x}{(x^2+9)^2} \Rightarrow f(x)=\frac{-2x^2+18}{(x^2+9)^2}=\frac{-2\cdot9^2+18}{(9^2+9)^2}$

$\frac{-2\cdot81+18}{(81+9)^2} \Rightarrow \frac{-162+18}{90^2} \Rightarrow \frac{-144}{90^2} \Rightarrow -\frac{144}{8100} \Rightarrow -\frac{4}{225}$ ///

8) $f(x)=e^{x^3+2x^2-4x+5}+9$



$e^{x^3+2x^2-4x+5}\cdot(3x^2+4x-4)$

$\Delta=16-4\cdot3\cdot4=16+16.3=64$

~~$\Delta=16+16$~~

$x=\frac{-4\pm8}{2\cdot3}=\frac{-4\pm8}{6}$ $x_1=\frac{-12}{6}=-2$ //

$x_2=\frac{+4}{6}=\frac{-4}{6}=\frac{+2}{3}$ //

2: D
3: B
1: E
4: B
8. E
6:
5: C
7: D