MINISTÉRIO DA EDUCAÇÃO
UNIVERSIDADE FEDERAL DO PIAUÍ
CAMPUS SENADOR HELVÍDIO NUNES DE BARROS
CHEFIA DO CURSO DE SISTEMA DE INFORMAÇÃO
Profa.: Aline Morais
Disciplina: Cálculo I
3ª Atividade Avaliativa

Aluno: Hector Jose Rodrigues Salgueiro

1- $y = x^3 - 3x + 4$

$y = 3x^2 - 3$

$y = 3 \cdot 2^2 - 3$

$y = 3 \cdot 4 - 3$

$y = 9$

2- a) $\frac{d}{dx}(3x^2 - 5x + 2)$

$\frac{d}{dx}(3x^2) - \frac{d}{dx}(5x) + \frac{d}{dx}(2);$

$\frac{d}{dx}(3x^2) = 6x \Rightarrow \frac{d}{dx}(5x) = 5 \Rightarrow \frac{d}{dx}(2) = 0;$

$6x - 5$

b) $\frac{d}{dx}\left(\frac{x^2+1}{2x+3}\right)$

$$\frac{\frac{d}{dx}(x^2+1)(2x+3) - \frac{d}{dx}(2x+3)(x^2+1)}{(2x+3)^2};$$

$\frac{d}{dx}(x^2+1) = 2x \Rightarrow \frac{d}{dx}(2x+3) = 2$

$$\frac{2x(2x+3) - 2(x^2+1)}{(2x+3)^2};$$

$$\frac{2x^2 + 6x - 2}{(2x+3)^2}$$

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2- c) $\frac{d}{dx}((4x^2+13x)\cdot(tg(x)-4))$

$\frac{d}{dx}(4x^2+13x)(tg(x)-4)+\frac{d}{dx}(tg(x)-4)(4x^2+13x);$

$\frac{d}{dx}(4x^2+13x)=8x+13 \Rightarrow \frac{d}{dx}(tg(x)-4)=sec^2(x);$

$(8x+13)(tg(x)-4)+sec^2(x)(4x^2+13x)$

d) $\frac{d}{dx}(ln(x^2+2x+5))$

$\frac{1}{x^2+2x+5}\frac{d}{dx}(x^2+2x+5);$

$\frac{d}{dx}(x^2+2x+5)=2x+2;$

$\frac{1}{x^2+2x+5}(2x+2);$

$\frac{2x+2}{x^2+2x+5}$

e) $\frac{d}{dx}(sec(x)e^{(3x)})$

$\frac{d}{dx}(sec(x))e^{3x}+\frac{d}{dx}(e^{3x})sec(x);$

$\frac{d}{dx}(sec(x))=sec(x)\,tg(x) \Rightarrow \frac{d}{dx}(e^{3x})=e^{3x}\cdot 3;$

$sec(x)\,tg(x)\,e^{3x}+e^{3x}\cdot 3\,sec(x)$

3- $f'''(X) = 2 \operatorname{sen} x + 3 \cos x - x^3$ Aluno: Hecto José Rodrigues Salgueiros

$2 \operatorname{sen}(X) + 3 \cos_{(x)} - x^3 = 2 \cos(X) - 3 \operatorname{sen}(X) - 3x^2;$

$2 \cos(X) - 3 \operatorname{sen}(X) - 3x^2 = -2 \operatorname{sen}(X) - 3 \cos(X) - 6x;$

$-2 \operatorname{sen}(X) - 3 \cos(X) - 6x \Rightarrow -2 \cos(X) - (-3 \operatorname{sen}(X)) - 6;$

$-2 \cos(X) + 3 \operatorname{sen}(X) - 6$

4- $S(t) = 2t^4 + 5t^2 + 2$

$S(5) = 2 \cdot 5^4 + 5 \cdot 5^2 + 2;$

$S(5) = 2 \cdot 5^4 + 5^3 + 2;$

$S(5) = 1250 + 125 + 2;$

$S(5) = 1377$

5- a) $\lim_{X \to 0} \dfrac{e^{\operatorname{sen}(X)} - 1}{\ln(X+1)}$

$$\lim_{X \to 0} \left(\frac{e^{\operatorname{sen}(X)} \cos(X)}{\frac{1}{X+1}} \right);$$

$$\lim_{X \to 0} \frac{e^{\operatorname{sen}(0)} \cos(0)}{\frac{1}{0+1}} = 1$$

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5- b) $\lim_{x\to 1}\left(\dfrac{\ln(x)}{sen(\pi x)}\right)$

Para $\lim_{x\to a}\left(\dfrac{f(x)}{g(x)}\right)$, se $\lim_{x\to a}\left(\dfrac{f(x)}{g(x)}\right)=\dfrac{0}{0}$, então $\lim_{x\to a}\left(\dfrac{f(x)}{g(x)}\right)=$
$=\lim_{x\to a}\left(\dfrac{f'(x)}{g'(x)}\right)$;

$\lim_{x\to 1}\left(\dfrac{(\ln(x))'}{(sen(x))'}\right)$;

$(\ln(x))'=\dfrac{1}{x} \Rightarrow (sen(\pi x))'=\cos(\pi x)\pi$;

$\lim_{x\to 1}\left(\dfrac{\frac{1}{x}}{\cos(\pi x)\pi}\right)\Rightarrow\left(\dfrac{\frac{1}{1}}{\cos(\pi 1)\pi}\right)=\dfrac{-1}{\pi}$

c) $\lim_{x\to 3}\left(\dfrac{36-4x^2}{2x^2+7x+3}\right)$

$\lim_{x\to -3}\left(\dfrac{-8x}{4x+7}\right)$;

$\lim_{x\to -3}\left(\dfrac{-8(-3)}{4(-3)+7}\right)$;

$\lim_{x\to -3}\dfrac{-24}{5}$

d) $\lim_{x\to 2}\left(\dfrac{1-2/x}{x^2-4}\right)$

$\lim_{x\to}\left(\dfrac{\frac{2}{x^2}}{2x}\right)\Rightarrow\left(\dfrac{\frac{2}{2^2}}{2\cdot 2}\right)=\dfrac{1}{8}$