MTH 1125 - Test 2 (1pm Class)

Fall 2018

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Instructions. Show CLEARLY how you arrive at your answers.

1. Compute: $\frac{d}{dx}\left[3x^5+5x^4+8x^3+10x^2+15x+10\sqrt{x}+2\right]=$

2. Compute: $\frac{d}{dx}\left[\left(x^3+3x\right)\tan\left(x\right)\right]=$

3. Compute: $\frac{d}{dx}\left[\frac{3x^2-6x+2}{4x^2+3x+3}\right]=$

4. Compute: $\frac{d}{dx}\left[\left(6x^{10}+\tan\left(x\right)\right)^5\right]=$

5. Given that $f\left(x\right)=4x^2+2x+2$, give the *equation* of the line tangent to the graph of $f\left(x\right)$ at the point $\left(2,22\right)$.

6. Given that $y = \frac{1}{2}x^2 + 4x$ and that $x = \csc(t)$; compute $\frac{dy}{dt}$ **using the Liebniz form of the Chain Rule.** (In particular, when doing this exercise, *write explicitly the Liebniz form of the chain rule that you are going to use.)*

7. Compute: $\frac{d}{dx}\left[\sin\left(5x^3 + 8x^2 + 3\right)\right] =$

8. Compute: $\frac{d}{dx}\left[\left(\frac{2x^4+8x}{3x^4+12x}\right)^4\right] =$

9. Compute: $\frac{d}{dx}\left[\tan^5\left(3x^3 + 9x\right)\right] =$

10. Given that $L'(x) = \frac{1}{x}$ (i.e., $\frac{d}{dx}\left[L(x)\right] = \frac{1}{x}$); compute $\frac{d}{dx}\left[L\left(x^2\right)\right]$

11. Given that $f(x) = 3x^2 - 4x + 5$, compute $f'(x)$ **using the definition of derivative.** (i.e., using the "limit process.")

12. Given that $x^3 + y^3 = \sin(y)$, compute y'