MTH 1125 - Test 2 (2pm Class)

Fall 2021

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Instructions. Show CLEARLY how you arrive at your answers.

1. Compute: $\frac{d}{dx}\left[4x^6+4x^5+6x^4+6x^3+8x^2+8x+10\sqrt{x}+10\right]=$

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

3. Compute: $\frac{d}{dx}\left[\frac{3x^5+6x^2+9}{4x^3+x}\right]=$

4. Compute: $\frac{d}{dx}\left[\left(8x^4+12x^3+6x^2\right)^4\right]=$

5. Given that $f(x) = 4x^3 + 4x^2 + 2$, give the *equation* of the line tangent to the graph of $f(x)$ at the point $(1, 10)$.

6. Given that $w = 4u^3 + 3u$ and that $u = \sin(v)$; compute $\frac{dw}{dv}$ **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: $\frac{d}{dx}\left[\cot\left(6x^3 + 9x^2\right)\right] =$

8. Compute: $\frac{d}{dx}\left[\left(\frac{8x^2+10x+8}{4x^2+8x}\right)^8\right] =$

9. Compute: $\frac{d}{dx}\left[\sec^8\left(4x^4+16x\right)\right] =$

10. Given that $x^5 - x^5y^4 = \cos\left(y\right),$ compute $\frac{dy}{dx}$

11. Given that $f\left(x\right) = 2x^2 - 8x + 3$, compute $f'\left(x\right)$ **using the definition of derivative.** (i.e., using the "limit process.")

Extra (Wow! 10 Points)

Given that $T'(x) = \frac{1}{3x^2+2x}$ (i.e., $\frac{d}{dx}[T(x)] = \frac{1}{3x^2+2x}$); compute $\frac{d}{dx}[T(\sin(x))]$