

MTH 1125 - Test 2 (12pm Class)

FALL 2019

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Name _____

Instructions. Show CLEARLY how you arrive at your answers.

1. Compute: $\frac{d}{dx} [3x^5 + 4x^4 + 5x^3 + 8x^2 + 15x + 32\sqrt{x} + 2] =$

2. Compute: $\frac{d}{dx} [(5x + \cos(x))(x^4 + 3x^2)] =$

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

4. Compute: $\frac{d}{dx} [(2x^4 + 3x^3 + 10x)^8] =$

5. Given that $f(x) = 3x^2 + 4x + 5$, give the *equation* of the line tangent to the graph of $f(x)$ at the point $(1, 12)$.

6. Given that $w = \tan(x)$ and that $x = v^2 + 2v + 3$; compute $\frac{dw}{dv}$ **using the Leibniz form of the Chain Rule.** (In particular, when doing this exercise, *write explicitly the Leibniz form of the chain rule that you are going to use.*)

7. Compute: $\frac{d}{dx} [\cot(2x^3 + 4x^2 + 3)] =$

8. Compute: $\frac{d}{dx} \left[\left(\frac{3x^4 + 24x}{5x^3 + 12x} \right)^{10} \right] =$

9. Compute: $\frac{d}{dx} [\sin^{10}(4x^3 + 12x)] =$

10. Given that $x^3 + x^4y^5 = y^3$, compute y'

11. Given that $f(x) = 6x^2 - 4x + 6$, compute $f'(x)$ **using the definition of derivative.**
(i.e., using the “limit process.”)

Extra (Wow! 10 Points)

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