

MTH 1125 - Test 2 (12pm Class) - Pod A

FALL 2020

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Name _____

Instructions. Show CLEARLY how you arrive at your answers.

1. Compute: $\frac{d}{dx} [4x^6 + 4x^5 + 6x^4 + 10x^2 + 24x + 40\sqrt{x} + 5] =$

2. Compute: $\frac{d}{dx} [(\tan(x) + \sin(x))(3x^4 + 6x^2)] =$

3. Compute: $\frac{d}{dx} \left[\frac{4x^2+1}{3x^4+6x^2+9} \right] =$

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

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

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

8. Compute: $\frac{d}{dx} \left[\left(\frac{4x^2 + 8x}{5x^2 + 12x} \right)^6 \right] =$

9. Compute: $\frac{d}{dx} [\cos^{15}(9x^3 + 9x)] =$

10. Given that $x^6 + x^3y^6 = \sin(y)$, compute y'

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

Extra (Wow! 10 Points)

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