

MTH 1125 - Test 2

SPRING 2016

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Name _____

Instructions. Show CLEARLY how you arrive at your answers.

1. Compute: $\frac{d}{dx} [2x^6 + 3x^4 + 4x^3 + 6x^2 + 12x + 24\sqrt{x} + 48] =$

2. Compute: $\frac{d}{dx} [(8x^5 + 16x) \sec(x)] =$

3. Compute: $\frac{d}{dx} \left[\frac{\tan(x)}{25x^4 + 33x^3 + 98x} \right] =$

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

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

6. Given that $x = 8t^2 + 8t$ and that $t = \sec(y)$; compute $\frac{dx}{dy}$ **using the Leibniz form of the Chain Rule.** (In particular, when doing this exercise, *write the Leibniz form of the chain rule, that you are going to use, explicitly.*)

7. Compute: $\frac{d}{dx} [\sec(4x^2 + 8x + 6)] =$

8. Compute: $\frac{d}{dx} \left[\left(\frac{2x^5 + 6}{5x^2 + 10x} \right)^{10} \right] =$

9. Compute: $\frac{d}{dx} [\tan^6(9x^2 + 18x)] =$

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

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