MTH 1125 - Test 2 (12pm Class)

Fall 2023

Pat Rossi Name _____

Instructions. Show CLEARLY how you arrive at your answers.

1. Compute: $\frac{d}{dx}\left[8x^5+10x^4+8x^3+12x^2+12x+24\sqrt{x}+10\right]=$

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

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

4. Compute: $\frac{d}{dx}\left[\left(3x^3+6x^2+15x\right)^{10}\right]=$

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

6. Given that $w = \cos(u)$ and that $u = 4t^2 + 2t + 2$; compute $\frac{dw}{dt}$ **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: $\frac{d}{dx}\left[\sec\left(8x^5 + 5x^2\right)\right] =$

8. Compute: $\frac{d}{dx}\left[\left(\frac{3x^2+12x}{4x^2+8x+16}\right)^8\right] =$

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

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

11. Given that $f(x) = 5x^2 - 6x + 2$, compute $f'(x)$ **using the definition of derivative.** (i.e., using the "limit process.")

Extra (Wow! 10 Points)

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