MTH 1125 Test #2

SUMMER 2022

Pat Rossi Name _____

Show CLEARLY how you arrive at your answers.

1. Compute: $\frac{d}{dx}\left[4x^6+6x^4-8x^3+12x^2+6x+3\sqrt{x}+5\right]=$

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

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

4. Compute: $\frac{d}{dx}\left[\left(8x^4+8x^2+5\right)^{10}\right]=$

5. Given that $f(x) = 2x^2 + 3x + 4$, give the *equation* of the line tangent to the graph of $f(x)$ at the point $(1, 9)$.

6. Given that $t = 4x^2 + 3x + 5$ and that $x = \tan(w)$; compute $\frac{dt}{dw}$ **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: $\frac{d}{dx}\left[\sec\left(4x^2 - 3x + 2\right)\right] =$

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

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

10. Given that $3x^2+2x^4y^2+5x^5=\sec\left(y\right),\quad$ compute $\frac{dy}{dx}$

11. Given that $f\left(x\right)=x^2+6x+5$, compute $f'\left(x\right)$ **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 $\frac{d}{dx}[S(\sin(x))]$