MTH 1125 (2 pm Class) - Test 2

Fall 2024

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Instructions. Show CLEARLY how you arrive at your answers.

1. Compute: $\frac{d}{dx}\left[4x^6+6x^4+8x^3+12x^2+24x+\sqrt{x}+6\right]=$

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

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

4. Compute: $\frac{d}{dx}\left[\left(4x^5+10x^2+10x+10\right)^{15}\right]=$

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

6. Given that $x = \sec(t)$ and that $t = 2y^3 + y$; compute $\frac{dx}{dy}$ **using the Liebniz form of the Chain Rule.** (In particular, when doing this exercise, write the Liebniz form of the chain rule, that you are going to use, explicitly.)

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

8. Compute: $\frac{d}{dx}\left[\frac{\left(3x^2+6\right)^{10}}{\left(2x^3+6x\right)^5}\right] =$

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

10. Given that $f(x) = 2x^2 - 5x + 6$,compute $f'(x)$ **using the definition of derivative.**

11. $x^2 + y^2 = 3x^2y^2$. Compute y'.

Extra (Wow! 10 pts!) Given that $S'(x) = \frac{1}{2S(x)}$ (i.e., $\frac{d}{dx}[S(x)] = \frac{1}{2S(x)}$); compute $\frac{d}{dx}[S(x^2 + x)]$