MTH 1125 (12 pm Class) - Test 2

FALL 2024

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Instructions. Show CLEARLY how you arrive at your answers.

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

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

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

4. Compute: $\frac{d}{dx}\left[\left(6x^5+10x^3+10\right)^{20}\right]=$

5. Given that $f\left(x\right)=3x^2-2x+3$, give the *equation* of the line tangent to the graph of $f\left(x\right)$ at the point $\left(2,11\right)$.

6. Given that $x = \sin(t)$ and that $t = 5y^3 - 2y$; 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: $\frac{d}{dx}\left[\cos\left(8x^4\right)\right] =$

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

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

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

11. $3x^2 + 3y^2 = x^3y^4$. Compute y'

Extra (Wow! 10 pts!) Given that $T'(x) = \frac{1}{1+x^2}$ (i.e., $\frac{d}{dx}[T(x)] = \frac{1}{1+x^2}$); compute $\frac{d}{dx}[T(\sec(x))]$