

Calculus

Name _____

HW 41: Unit 3.8-3.9 Review**Implicit, Exponentials, Logarithms**

Find the first derivative and simplify. Box your final answer.

1. $y = x^{e-3}$

2. $y = \ln(3x^5)$

3. $y = 5^{-3x}$

4. $y = e^{10x}$

5. $y = \log_5(4x)$

6. $y = xe^{4x} + 5e^{6x}$

7. $y = 5^{\sin 2x}$

8. $y = 3x - x \ln x$

9. $y = (\ln x)^4$

10. $y = \log_3 2\sqrt{x}$

11. $3y = x^3 + 6\cos y$

12. $x = 3\cot y$

13. $2x^3 - 5xy + y^2 = 8$

14. Write the equations of the tangent line and the normal line of $4x^2 - 3y - y^2 + 5 = 0$ at the point $(3, 1)$.

15. Write the equations of the tangent line and the normal line of $2xy + \pi \sin y = 2\pi$ at the point $\left(1, \frac{\pi}{2}\right)$.

16. Find the second derivative: $x^2 - y^2 = 8x$

17. Find $\frac{d^2y}{dx^2}$: $x^2 + 2x = y^2$