

Quiz #5

Directions: Carefully read each question below and answer to the best of your ability in the space provided. Your answer to problem # 2 should be written in a clear and concise manner. You **MUST** show your work to receive full credit!

Calculators are not allowed for the quiz.

1. (1 point) Find the derivative of $\sin(x^3 + x)$.
 - A. $\sin(3x^2 + 1)$
 - B. $\cos(x^3 + x)$
 - C. $(3x^2 + 1)\sin(x^3 + x)$
 - D. $\cos(3x^2 + 1)$
 - E. $(3x^2 + 1)\cos(x^3 + x)$**
2. (2 points) Use implicit differentiation to find a formula for y' where $y^2 \ln(x) = x^2$.

Solution: First, let's take derivative on both sides and then solve for y' , that's

$$\begin{aligned} 2yy' \cdot \ln(x) + y^2 \cdot \frac{1}{x} &= 2x \\ 2yy' \ln(x) &= 2x - \frac{y^2}{x} \\ 2yy' \ln(x) &= \frac{2x^2 - y^2}{x} \\ y' &= \frac{2x^2 - y^2}{2xy \ln(x)}. \end{aligned}$$

Thus, $y' = \frac{2x^2 - y^2}{2xy \ln(x)}.$

Name: _____

Question:	1	2	Total
Points:	1	2	3
Score:			