

Name: _____

There are 25 points possible on this quiz. This is a closed book quiz. Calculators and notes are not allowed. **Please show all of your work!** If you have any questions, please raise your hand.

Exercise 1. (6 pts.) Differentiate the following functions.

(a) $f(t) = 5^{2t^2}$

(b) $f(\theta) = \theta \sin \theta \cos \theta$

Exercise 2. (6 pts.) find the derivatives of the following functions.

(a) $g(x) = \sec^3(5x)$

(b) $f(x) = e^{x \csc x}$

Exercise 3. (4 pts.) For what values of x **if any**, does $y = \sqrt{x^2 + x}$ have a horizontal tangent?

Exercise 4. (4 pts.) Find an equation of the tangent line to the curve $y = \frac{10}{(\tan x + 2)^2}$ at the point $(0, 5)$. [The point should have been $(0, 5/2)$.]

Exercise 5. (5 pts.)

(a) Find the first four derivatives of $y = \cos(4x)$.

(b) Using your answer to (a), find the 50th derivative of $y = \cos(4x)$.