Name: _____ _____ **/ 25**

There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. [15 points] Find the derivative for each function below. You do not need to simplify. You do need to use parentheses correctly.

a. $h(x) = 4^x + \log_4(x)$

b. $f(x) = \sin^{-1}(\sqrt{x})$

c. $y = \left(x^{-1} + \tan^{-1}(x)\right)^3$

d. $g(x) = \dfrac{x^3 \sin x}{e^x}$

e. $y = \ln\left(\dfrac{7x^{5/3}}{\sec x}\right)$

2. [5 points] Use implicit differentiation to find $\dfrac{dy}{dx}$ for $e^y = x^3 y + 7$. Clearly indicate when you take the derivative of both sides of the equation.

3. [5 points] Use logarithmic differentiation to find $\dfrac{dy}{dx}$ for $y = x^{\cos x}$. Clearly indicate when you take the derivative of both sides of the equation.