

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. $h(x) = 2^x + \log_2(x)$

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

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

d. $g(x) = \frac{x^2+1}{e^{2x}}$

e. $y = 5x^{4/3} + \ln(5x^{4/3})$

2. [5 points] Use implicit differentiation to find $\frac{dy}{dx}$ for $x^2 + y^2 = \cos(xy) + 2$.

3. [5 points] Use logarithmic differentiation to find $\frac{dy}{dx}$ for $y = (\sin(2x))^x$.