

Math 1A Quiz 3
October 11th, 2007

Name _____ SID _____

1. Consider the equation

$$y^{2x} = e^{x+\cos x}.$$

Use logarithmic differentiation to find y' in terms of x and y . You may assume $y > 0$.

2. For each of the following functions f , state whether f has an inverse. If no, explain why not. If yes, find $f^{-1}(2)$.
- a) $f(x) = x^2 + 2x + 1$.

b) $f(x) = 2x + \sin(x - 1)$.

c) $f(x) = e^{(e^x)}$.

3. Calculate

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\ln |\sin x|}{x - \frac{\pi}{2}}.$$

Bonus Point: Find two functions f and g , defined for all real numbers, such that $f \circ g$ is invertible, but neither f nor g is invertible.