Quiz 3A, Calculus I

Dr. Graham-Squire, Spring 2013

Name: Key

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1. (5 points) Use implicit differentiation to find y' for the equation

$$\frac{d}{dx}\left(\frac{\tan y}{e^x} + 8 = x^3\right)$$

$$\Rightarrow \frac{\sec^2 y \cdot y' \cdot e^x - (\tan y)e^x}{(e^x)^2} + 0 = 3x^2 \quad \Big\} \; 3.5$$

$$\Rightarrow \frac{\sec^2 y \cdot y'}{e^x} - \frac{\tan y}{e^x} = 3x^2$$

$$\frac{\sec^2 y \cdot y'}{e^x} = 3x^2 + \frac{\tan y}{e^x} \quad \Big\} \; 1.5$$

$$y' = \frac{e^x}{\sec^2 y}\left(3x^2 + \frac{\tan y}{e^x}\right)$$

2. (5 points) Find the derivative:

$\frac{d}{dx}\left(\cos(e^{3x})\right)$

$= -\sin(e^{3x}) \cdot e^{3x} \cdot 3$ ✓

$= -3\sin(e^{3x}) \cdot e^{3x}$

Quiz 3B, Calculus I

Dr. Graham-Squire, Spring 2013

Name: Key

1. (5 points) Find the derivative:

$$\frac{d}{dx}\left(\sin(e^{4x})\right)$$

$= \cos(e^{4x}) \cdot e^{4x} \cdot 4$

2. (5 points) Use implicit differentiation to find y' for the equation

$$\frac{d}{dx}\left(x^2 - 5 = \frac{\cot y}{e^x} \right)$$

$$2x = \frac{-\csc^2 y \cdot y' \cdot e^x - \cot y \cdot e^x}{(e^x)^2}$$

multiply e^{2x} to other side

$$2x \cdot e^{2x} = -\csc^2 y \cdot e^x \cdot y' - e^x \cot y$$

$$2x e^{2x} + e^x \cot y = -\csc^2 y \cdot e^x \cdot y'$$

$$\frac{2x e^{2x} + e^x \cot y}{-\csc^2 y \cdot e^x} = y'$$