

MATH 1850 Sec 011 and 012

CALCULUS I

QUIZ 6

October 14, 2010

Name (Last, First) _____

1. Find the derivative of the function

$$y = \tan^2(\sin^3 t)$$

Use Chain Rule, $\frac{dy}{dt} = 2 \tan(\sin^3 t) \sec^2(\sin^3 t) \frac{d(\sin^3 t)}{dt}$

Use Chain Rule again,

$$\frac{dy}{dt} = 2 \tan(\sin^3 t) \sec^2(\sin^3 t) 3 \sin^2 t \cos t$$

$$\frac{dy}{dt} = 6 \tan(\sin^3 t) \sec^2(\sin^3 t) \sin^2 t \cos t$$

2. Use **implicit differentiation** to find dy/dx to find

$$e^{2x} = \sin(x + 3y)$$

Take derivatives on both sides with respect to x .

$$2e^{2x} = \frac{d(\sin(x + 3y))}{dx}$$

$$2e^{2x} = [\cos(x + 3y)](1 + 3\frac{dy}{dx})$$

$$2e^{2x} - \cos(x + 3y) = 3\frac{dy}{dx} \cos(x + 3y)$$

$$\frac{dy}{dx} = \frac{2e^{2x} - \cos(x + 3y)}{3 \cos(x + 3y)}$$