Name: Key

Math 1310-004
Quiz 6
October 10, 2014

1. (5 points) Use implicit differentiation to find the equation of the tangent line to the curve given by:

$$x^2 + 2xy - y^2 + x = 2$$

at the point $(1, 2)$.

$$2x + \left(2x\frac{dy}{dx} + 2y\right) - 2y\frac{dy}{dx} + 1 = 0$$

$$\frac{dy}{dx}(2x - 2y) = -2x - 2y - 1$$

At (1,2): $\frac{dy}{dx}(-2) = -7$; $\frac{dy}{dx} = \frac{7}{2}$

Tangent: $y - 2 = \frac{7}{2}(x - 1)$ or $y = \frac{7}{2}x - \frac{3}{2}$

2. (5 points) Find the derivative of:

$$y = \tan^{-1}(x^2)$$

$$\frac{dy}{dx} = \frac{1}{1+(x^2)^2} \cdot 2x = \frac{2x}{1+x^4}$$