Name: February 18, 2016 MAC 2313.9256 Cyr

> Quiz 6 You must show all work to receive full credit!!

**Problem 1.** (6 pts) Let  $f(x, y) = \frac{x^2}{y^2 + 1}$ . (a) Find an equation of the tangent plane to f(x, y) at the point (4, 1).

(b) Calculate the directional derivative of f(x, y) in the direction of  $\mathbf{v} = \langle 3, 2 \rangle$  at the point (4, 1).

**Problem 2.** (4 pts) Let  $g(x, y) = x^2 - y^2$ ,  $x = e^u \cos(v)$ ,  $y = e^u \sin(v)$ . Use the chain rule to evaluate the partial derivative  $\frac{\partial g}{\partial u}$  at the point  $(u, v) = (0, \pi)$ .