

# MATH 251: Quiz 3

February 26, 2015

Name: \_\_\_\_\_ Sec: \_\_\_\_\_

Note: Questions 2 and 3 are on the back.

1. Find an equation for the tangent plane to the graph of

$$z = f(x, y) = y^3 + 2ye^x$$

at the point  $(0, 3)$ . [Hint: This plane must contain the vectors  $\langle 1, 0, f_x \rangle$  and  $\langle 0, 1, f_y \rangle$ . Or you can use any other method to find this plane.]

2. Compute the gradient of the function

$$g(x, y, z) = 2z^2e^{xy} + x^2y^2.$$

3. Given the function

$$h(x, y) = x^3y^2 + 2xy$$

and the parametrizations

$$x(s, t) = 3s + 2t \quad y(s, t) = 4s - t$$

use the Chain Rule to compute the derivatives  $\frac{\partial h}{\partial s}$  and  $\frac{\partial h}{\partial t}$  evaluated at the point  $(s, t) = (\frac{3}{11}, \frac{1}{11})$  [that is,  $(x, y) = (1, 1)$ ].