

"QUIZ" for Lecture 7

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q7FirstLast.pdf) ASAP BUT NO LATER THAN Sept. 28, 8:00pm

1. Compute the partial derivatives with respect to  $x$  and  $y$ .

$$z = \ln(x^2 + y^3)$$

$$x: \frac{\partial f}{\partial x} (\ln(x^2 + y^3)) = \frac{1}{x^2 + y^3} \cdot 2x = \frac{2x}{x^2 + y^3}$$

$$y: \frac{\partial f}{\partial y} (\ln(x^2 + y^3)) = \frac{1}{x^2 + y^3} \cdot 3y^2 = \frac{3y^2}{x^2 + y^3}$$

2. Find an equation of the tangent plane to the given surface at the specified point.

$$z = x^2 + y^2 + 2, \quad (1, 1, 4)$$

$$f_x(z(x, y)) = 2x + 2 \Rightarrow f_x(z(1, 1)) = 2(1) + 2 = 4$$

$$f_y(z(x, y)) = 2y + 2 \Rightarrow f_y(z(1, 1)) = 2(1) + 2 = 4$$

$$Z - Z_0 = f_x(x_0, y_0)(x - x_0) + f_y(x_0, y_0)(y - y_0)$$

$$Z - 4 = 4(x - 1) + 4(y - 1)$$

$$Z = 4x - 4 + 4y - 4 + 4$$

$$Z = 4x + 4y - 4$$