Name: ______________________

Score: ________ /15

WORKSHEET 3 - CHAPTER 14 (DUE TUES, MAR 3)

Math 2110Q – Spring 2015
Professor Hohn

You must show all of your work to receive full credit!

1. (a) Find an equation of the tangent plane to the surface $z = xe^{xy}$ at the point $(2, 0, 2)$.

   (b) If $f(x, y) = \sqrt[3]{x^3 + y^3}$, find $f_x(1, 1)$.

2. If R is the total resistance of there resistors, connected in parallel, with resisitances R_1, R_2, R_3, then

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

If the resistances are measured in ohms as $R_1 = 25\Omega$, $R_2 = 40\Omega$, $R_3 = 50\Omega$, with a possible error of 0.5% in each case, estimate the maximum error in the calculated value of R.

3. If $z = f(x, y)$, where $x = r\cos\theta$, and $y = r\sin\theta$, find

(a) $\partial z/\partial r$

(b) $\partial z/\partial\theta$

4. Show that any function of the form

$$z = f(x + at) + g(x - at)$$

is a solution of the wave equation

$$\frac{\partial^2 z}{\partial t^2} = a^2 \frac{\partial^2 z}{\partial x^2}$$

[Hint: Let $u = x + at$ and $v = x - at$.]