Quiz 09/05/2012 Name_____

1. Suppose $f(x,y) = \frac{x^2}{4} + \frac{y^2}{9}$. Sketch the level set $1 = f(x,y)$. Sketch the graph $z = f(x,y)$ and describe the shape of the graph in a sentence.

2. Suppose $z = x\sin(x\,y)$. Calculate the following:

$$\frac{\partial z}{\partial x} =$$

$$\frac{\partial z}{\partial y} =$$

$$\frac{\partial^2 z}{\partial y \partial x} =$$

3. Find the equation of the plane tangent to $z = y^2 - x^3$ at $(1,2,3)$.

4. Suppose $z = x\,e^y$, $x = f(t)$ and $y = g(t)$. Use the Chain Rule to express the derivative of $\frac{dz}{dt}$ in terms of x, y, $f'(t)$ and $g'(t)$.