Math 16C
Vogler
Worksheet 4

1.) Find z_x and z_y for each of the following functions.

a.) $f(x,y) = \sin 3x + \cos 5y$

b.) $f(x,y) = \cos(x^2 y)$

c.) $f(x,y) = \ln(\sec x - \tan y)$

d.) $f(x,y) = e^{x^2 \sin y}$

e.) $f(x,y) = \dfrac{\ln y}{\ln x + \ln y}$

f.) $f(x,y) = \cot^2(4y) - \csc^3(5xy)$

g.) $f(x,y) = \sqrt{7y^2 + 6\cot(11 - \pi e^{(-1/2)\sqrt{y}})}$

h.) $f(x,y) = \ln\{\ln\{\ln(3x - 9y^2)\}\}$

2.) Find z_x, z_y, z_{xx}, z_{yy}, and z_{xy} for $f(x,y) = \sin(xy)$.

3.) Let $f(x,y) = (y + 7x)^2$. Show that $z_{xx} = 49 \cdot z_{yy}$.

4.) Find a function $z = f(x,y)$ so that

$z_x = y^3 - 2x + 5$ and $z_y = 2ye^{y^2} + 3xy^2$.