Quiz 5
Math 202 F01

Name: Solutions
2/27/15

1. Compute $\frac{\partial f}{\partial z}$ for the function

$$f(x,y,z) = \cos(2\pi x^2) + \sqrt{\frac{z}{y}} + y\ln(xz+1).$$

$\frac{\partial f}{\partial z} = 0 + \frac{1}{\sqrt{y}}\frac{1}{2}(z)^{-1/2} + \frac{y}{xz+1}(x) = \frac{1}{2\sqrt{yz}} + \frac{xy}{xz+1}$

2. Consider the function $g(u,v) = u^2 - 2uv + v^3$.

(a) At the point $(u,v) = (3,-1)$, is g more sensitive to changes in u or to v? Show enough work to justify your answer.

$dg = \frac{\partial g}{\partial u}du + \frac{\partial g}{\partial v}dv$

$= (2u-2v)du + (-2u+3v^2)dv$

$= 8du + (-3)dv$

More sensitive to changes in u, since $|8| > |-3|$.

(b) If from the point $(u,v) = (3,-1)$ the value of v is increased by a small amount, will g increase or decrease?

Since $\frac{\partial g}{\partial v}(3,-1) = -3$, g will decrease.