Quiz #4 – Take-home (15 points total) Name: _____

Math 140, Prof. Beydler Due date: Wednesday, December 7, 2016

Directions: Show all work. You may use your notes and book. It's okay to get help, just be sure you're not copying someone else's work. Please box your answers.

1. (1 point) Find the domain of each function. Then compute the value of the function at the given point.

$f(x,y) = \frac{e^{xy}}{\sqrt{x-2y}}$ $(0,-2)$

2. (2 points) Compute f_{yx} for $f(x,y) = x^2y^3 + 3xy^2 - 2x + y$.

3. (5 points) Use the method of Langrage multipliers to find the minimum value of $f(x,y) = x^2 + xy + y^2$ subject to the constraint $2x - y = \frac{70}{5}$.

4. (2 points) The demand functions for a pair of commodities are given. Use partial derivatives to determine whether the commodities are substitute, complementary, or neither.

$D_1 = 2000 + \frac{100}{p_1+2} + 25p_2;\ D_2 = 1500 - \frac{p_2}{p_1+7}$

5. (5 points) Find the critical points of the given function and classify each as a relative maximum, a relative minimum, or a saddle point.

$f(x,y) = 4 + x^3 + y^3 - 3xy$