Math 114. Fall 2014. HW 5. Due Oct 29th Wednesday

Instructions for written homework.

- You are encouraged to work with others on these problems. You are expected to write the solutions yourself.
- Your solutions should be legible and well organized. **Graders will deduct points for solutions that are difficult to read, or are disorganized.** For the benefit of the grader, please turn in solutions to problems in the assigned order, i.e. #1, then #2, then #3, etc.
- Staple your pages together. Do not turn in notebook paper with tattered edges. **Homework that is unstapled or is lacking a name will not be graded.**

Problem 1 (Fall 2011)**.** Find the product of the maximal and the minimal values of the function

$$f(x, y) = x - 2y + 2xy$$

in the region

$$(x - 1)^2 + (y + 1/2)^2 \leq 2.$$

Problem 2 (Spring 2009)**.** Find the maximum of the function $F(x, y, z) = 2x + y - z$ on the surface

$$4x^2 + 2y^2 + z^2 = 40.$$

Problem 3 (Spring 2013)**.** Find the product of the maximum and minimum values of

$$f(x, y, z) = (x - 2)^2 + (y - 1)^2 + (z + 2)^2$$

on the sphere

$$x^2 + y^2 + z^2 = 1$$

Problem 4 (Section 14.7 # 38)**.** Let

$$f(x, y) = 4x - 8xy + 2y + 1.$$

Find the absolute maxima and absolute minima of f in the domain bounded by the lines $x = 0$, $y = 0$ and $x + y = 1$ in the first quadrant.

Problem 5 (Fall 2011)**.** Compute the double integral

$$\int_0^1 \int_{e^y}^e \frac{e - x}{\ln(x)} dx dy$$

Problem 6 (Spring 2013)**.** Compute the integral

$$\int_0^1 \int_0^{2-2x} \frac{(2x-y)^2}{2x+y} dydx$$

Hint: A change of variable might help.

Problem 7 (Spring 2011)**.** Calculate

$$\iint_T x^2 dA$$

where T is the triangular region with vertices $(0,0)$, $(1,0)$ and $(1,2)$.

Problem 8 (Fall 2010)**.** Evaluate

$$I = \int_0^4 \int_{\sqrt{x}}^2 \sin(y^3) dydx.$$

Problem 9 (Spring 2011)**.** Evaluate

$$I = \int_0^2 \int_{x^2}^4 \frac{e^{\sqrt{y}}}{y} dydx.$$