Math 2415

Problem Section #6

Exam One Review

To allow you maximum flexibility we will not assess your active participation in the Problem Section this week. Students in the Monday Problem Sections may either join in a Friday Section as a guest (look for email instructions from your TA) or participate via the Discussion Forum.

Do whatever past exam problems your group wants to. Here are some suggestions to get started:

1. (From Fall 2006 Exam 1) Suppose that

$$\mathbf{r}(s, t) = (1 + 2s - 3t, 5 + s, -3 + 4s - t)$$

   is a parametrization of a plane. Find a level set equation for this plane, *i.e.*, an equation of the form $ax + by + cz = d$.

2. (From Fall 2006 Exam 1) Show that the parametrized curve $\mathbf{r}(t) = (\cos t, \sin t, 1)$ lies on the following two surfaces:

   (a) $\rho = \sqrt{2}$ (in spherical coordinates)
   (b) $z = r$ (in cylindrical coordinates).

   Also sketch both surfaces and the curve in the same figure.

3. (From Fall 2006 Exam 1) Show that the volume of the parallelipiped determined by the three vectors $\mathbf{u}$, $\mathbf{v}$ and $\mathbf{w}$ is $|\mathbf{u} \cdot (\mathbf{v} \times \mathbf{w})|$.

4. Fall 2016, Exam 1

5. Spring 2016, Exam 1

6. Fall 2015 Exam 1, problems 1,2,3,5,7