Math 235 Assignment 7 Due November 24, 2009

Part I: Webwork. Links for the Webwork part of the homework are on the course web page. Your user name is the part of your student e-mail address before the @ symbol, so if your e-mail address is red@student.umass.edu, then your username is red. Your password is your 8 digit student ID.

Part II:

1: Write the rotation by angle $\pi/6$ about an axis through the center of the earth and Shanghai as a product of 5 rotations. Do not multiply out the 5 matrices.

2: Let $A = \begin{pmatrix} 4 & 2 & 0 \\ 4 & 6 & 0 \\ 5 & 2 & 3 \end{pmatrix}$, for what values of $\lambda$ is the matrix $A - \lambda I_3$ invertible?

3: Let $A$ be a $4 \times 4$ matrix with rows $v_1, v_2, v_3, v_4$. Assume that $\det(A) = 8$.

3a: What is the determinant of the matrix

$$\begin{pmatrix} v_1 \\ v_2 - 9v_1 \\ v_3 \\ v_4 \end{pmatrix}$$

3b: What is the determinant of the matrix

$$\begin{pmatrix} v_1 \\ v_2 \\ 3v_3 - 9v_1 \\ v_4 \end{pmatrix}$$

4: Let $P_2$ denote the vector space of all polynomials of degree less than or equal to 2. Define

$$F : P_2 \to P_2$$

by

$$f \mapsto 3f' - 4f$$

What is $\det(F)$?