Math 254 Spring 2014 Exam 2b

Please read the following directions:

Please print your name in the space provided, using large letters, as "First LAST". Books, notes, calculators, and other aids are not permitted on this exam. Please write legibly, with plenty of white space. Please put your answers in the designated areas. Show all necessary work in your solutions; if you are unsure, show it. Cross out work you do not wish graded; incorrect work can lower your grade. All problems are worth 5-10 points; your total will be scaled to the standard 100 point scale. You have approximately 30 minutes.

Extra credit may be earned by handing in revised work in class on Friday 2/21; for details see the syllabus. You will find this exam on the instructor's webpage later today.

1. Carefully state the definition of "vector space". Give two examples.

2. Give a nonhomogeneous system of two linear equations in two unknowns, such that the associated homogeneous system has infinitely many solutions. Find a basis for this homogeneous system.

3. What is partial pivoting and why would you use it?

The remaining two problems both concern the matrix $A = \begin{bmatrix} 2 & 4 & 2 & 0 & 6 \\ 2 & 5 & 2 & 1 & 7 \\ 2 & 3 & 2 & 1 & 3 \\ 3 & 4 & 3 & 1 & 4 \end{bmatrix}$. 4. Place A in echelon form. Be sure to justify each step.

5. Place A in row canonical form. Be sure to justify each step. You should begin with your answer from (4).