Math 254 Fall 2014 Exam 2a

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 Wednesday 9/17; for details see the syllabus. You will find this exam on the instructor's webpage later today.

1. Carefully state the definition of matrix space $M_{m,n}$. Give a set of two vectors, drawn from $M_{2,2}$.

2. List, in any order, the three elementary operations that leave unchanged the solution set to a system of linear equations.

3. Solve the following system of equations using back-substitution. Show your work.

$$\begin{aligned} 6x_1 + 3x_2 + 2x_3 - x_4 &= 4 \\ 5x_2 + 3x_3 + 2x_4 &= 5 \\ -7x_3 + 3x_4 &= 15 \\ 2x_4 &= 10 \end{aligned}$$

4. Find the line of best fit for the following set of points: $\{(-2, 2), (1, 1), (3, 3), (4, 4)\}$.

5. Give a system of three equations in unknowns x, y with no solutions, with the additional property that none of the three lines has the same slope as either of the others.