Math 215 HW #1

Due 5:00 PM Thursday, January 28

Reading: Sections 1.1–1.3 from Strang's *Linear Algebra and its Applications*, 4th edition. Reading and understanding the material from the textbook is an important part of the course, so please do not skip this step.

Problems: Please follow the guidelines for collaboration detailed in the course syllabus.

1. Problem 1.2.3. There are solutions to this and other odd-numbered problems in the back of the book, which you are welcome to consult *after* you have made a concerted attempt to solve the problem. In other words, you can use the back of the book to check your answer or to try to get un-stuck, but not as the starting point of your problem-solving. Also, the solution in the back of the book essentially consists of unsupported true statements and is not nearly detailed enough to get you full points on the problem.

2. Problem 1.2.4.

3. Problem 1.2.8.

4. Problem 1.2.10. Note $(0, y_1)$, $(1, y_2)$, and $(2, y_3)$ are *points*, not *vectors*.

5. Problem 1.2.22. The first sentence is the actual problem and the third sentence is a suggestion on how you might try to get a feel for what's going on. The second and fourth sentences are essentially foreshadowing.

6. Problem 1.3.6.

7. Problem 1.3.12.

8. Problem 1.3.30.

9. Prove that it is impossible for a system of linear equations to have exactly two solutions. Two questions you might think about to get your thinking started: (i) if (x_1, y_1, z_1) and (x_2, y_2, z_2) are two solutions, what is another one? (ii) If 25 planes meet at 2 points, where else do they meet?