Linear Algebra. Math-4100, Fall 2007
Assignment 6

Due Thursday, October 25, by 4pm. (Either in class, or my mailbox in AE 301, or under my door AE 405).

Reading

Oct. 15 and 18: **Strang** Sections 7.1–7.2.
Oct. 22 and 25: **Strang** Sections 7.3–7.4 (sub-section Similar Matrices); Gelfand Sec. 9.

Problems

You are encouraged to consult the text and notes and discuss the problems with other people. However, the solutions should be *yours*. Please indicated on your papers, who you discussed the problems with. *Please submit extra credit problems on a separate sheet of paper.*

1. Problem 5.3 #23.

2. Problem 5.3 #25.

3. Problem 7.1 #14. Suppose $A = \begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix}$. Let the transformation T be defined on the space V of all 2×2 matrices as $T(M) = AM$.

   (a) Show that the kernel of T is the zero matrix, i.e., if $AM = 0$ then M must be zero matrix.

   (b) Show that the range of T is the whole space V, i.e., for any matrix $B \in V$ there is a matrix M such that $AM = B$.

4. Problem 7.1 #18.

   R.1. Read `worked example 7.2 B`.

5. Problems 7.2 #1 & 2.

6. Problems 7.2 #5, 9, & 10.

7. Problems 7.2 #11 & 12.

8. Problems 7.2 #16 & 18.

9. (a) Problem 7.2 #29.

   (b) (Problem 7.2 #30) Suppose T is a reflection of the xy plane across the x axis and S is a reflection across the y axis. Find $S(T(\mathbf{v}))$ for $\mathbf{v} = (x, y)$. Find a simpler description of the product ST.