Math 215 HW #8

Due 5:00 PM Thursday, April 1

Reading: Sections 4.1–4.3 from Strang's *Linear Algebra and its Applications*, 4th edition.

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

1. Problem 4.2.4.
2. Problem 4.2.6.
3. Problem 4.2.8.
4. Problem 4.2.10.
5. Problem 4.2.14.
6. Problem 4.2.26. a_{ij} is the entry in the ith row and jth column of the matrix A.
7. Problem 4.3.6.
8. Problem 4.3.8.
9. Problem 4.3.14. Feel free to use whatever technique for computing the determinant you prefer.
10. Problem 4.3.28.
11. Let the numbers S_n be the determinants defined in Problem 4.3.31.
    (a) For any $n > 2$ prove that $S_n = 3S_{n-1} - S_{n-2}$.
    (b) For any k let F_k denote the kth Fibonacci number (recall that the Fibonacci sequence $1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, \ldots$ is defined by $F_k = F_{k-1} + F_{k-2}$). Prove that $F_{2n+2} = 3F_{2n} - F_{2n-2}$.
    (c) Show that $S_n = F_{2n+2}$ for each n.
12. (**Bonus Problem**) Problem 3.5.12. You'll need to read Section 3.5 to do this problem.