Math 475, Problem Set #1
(due 1/26/06)

A. Section 1.8, problem 3. (Hint #1: Use a coloring-argument, as in section 1.1. Hint #2: Try playing with smaller even-by-even rectangles if 8-by-8 seems too big.)

B. Section 1.8, problem 4(a).

C. Repeat the preceding problem, with a twist. Now $f(n)$ counts the number of different perfect covers of a 1-by-n (not 2-by-n!) chessboard by colored tiles of three kinds: a red 1-by-1 tile, a blue 1-by-1 tile, and a green 1-by-2 tile.

D. Section 1.8, problem 21.

E. Section 1.8, problem 26.

F. Twenty-five students are seated in a square arrangement with 5 rows of 5 desks each. The teacher tells all the students to switch desks so that every student is switched to a desk either directly to the front, to the back, to the right, or to the left of the original desk. Can all the students switch to a new desk simultaneously?

For each problem on this assignment (and in every future assignment!), please be sure to write down HOW MANY HOURS you spent working on the problem, and WHOM YOU WORKED ON IT WITH. Also keep in mind that having the correct answer or main idea is not enough; it must be expressed clearly. If you can't solve a problem completely, you can get partial credit by explaining how far you got and what the obstacles were.