MATH 579 Exam 8; 4/19/12
Please read the exam instructions.

No books or notes are permitted for this exam; calculators are permitted though. Please indicate what work goes with which problem, and put your name or initials on every sheet. Cross out work you do not wish graded; incorrect work can lower your grade, even compared with no work at all. Show all necessary work in your solutions; if you are unsure, show it. Simplify all numerical answers to be integers, if possible. You have 40 minutes. If you wish, when handing in your exam you may attach your extra credit problem. For more details, see the syllabus.

Choose three problems only from these five.

1. (5-8 points) Solve the recurrence given by $a_0 = a_1 = 2, a_n = -2a_{n-1} - a_{n-2}$ $(n \geq 2)$.

2. (5-10 points) Solve the recurrence given by $a_0 = 3, a_n = 3a_{n-1} - 4$ $(n \geq 1)$.

3. (5-10 points) How many ways are there to climb a flight of n stairs, where each of your steps may move you one or two stairs higher?

4. (5-10 points) Codewords (strings) from the alphabet $\{0, 1, 2\}$ are called *legitimate* if they have an even number of 0's. How many legitimate codewords are there of length k?

5. (5-12 points) You open a holiday savings account in early January with $500 you won in a scratch game. It pays the princely sum of 1% interest, compounded monthly. You have $20 automatically deposited at the end of each of your twice-monthly pay periods; your deposits begin to earn interest in the month after they are made. On December 19, you're ready to shop. How much will you have saved up?