Math 574, Exam 3, Summer 2007

Write your answers as legibly as you can on the blank sheets of paper provided. Use only one side of each sheet. Be sure to number your pages. Put your solution to problem 1 first, and then your solution to number 2, etc.; although, by using enough paper, you can do the problems in any order that suits you.

Please leave room in the upper left corner for the staple.

There are 5 problems. The exam is worth a total of 50 points. SHOW your work. CIRCLE your answer. CHECK your answer whenever possible. No Calculators.

If I know your e-mail address, I will e-mail your grade to you. If I don’t already know your e-mail address and you want me to know it, then send me an e-mail.

You should KEEP this copy of your exam.

I will post the solutions on my website sometime after 3:15 today.

1. (7 points) How many monomials of degree less than or equal to $d$ are there in $n$ variables. (Recall that the monomial $x_1^{e_1}x_2^{e_2}\cdots x_n^{e_n}$ has degree equal to $e_1 + e_2 + \cdots + e_n$.)

2. (7 points) A candy store has three flavors: chocolate, vanilla, and strawberry. Every bag of candy contains 10 pieces of candy all together and at least 3 pieces of chocolate candy. How many possible bags of candy can be made?

3. (7 points) Twenty people have formed a club. The club has four committees: The Steering Committee has 5 people, the Issues Committee has 2 people, the Fund Raising Committee has 3 people, and the Entertainment Committee has 10 people. How many ways can the committee assignments be distributed, if every person lands on exactly one committee?

4. (7 points) Find a recurrence relation which counts the number of strings of length $n$ which are made out of 0’s and 1’s and contain at least 3 consecutive zeros.

5. (22 points) Find the general solution of recurrence relation

$$a_n = 5a_{n-1} - 8a_{n-2} + 4a_{n-3} + 2^n.$$