**HW #5**

in the text, pages 126-131

1. There are three coins in a barrel. These coins, when flipped, will come up heads with respective probabilities .3, .5, and .7 . A coin is randomly selected from among these three and is then flipped ten times. Let N be the number of heads obtained on the ten flips. Find P(N=0).

2. Suppose you pick people at random and ask them what month of the year they were born in. (Assume all months are equally likely to have been born in.)

a) What is the probability that it takes you until the 5th person to find someone born in December?

b) What is the expected number of people you have to question to find someone born in December?

3. Assume that the number of typographical errors per page is a Poisson random variable with an average of 3 mistakes per page.

a) what is the probability of getting exactly 2 mistakes on page 23?

b) what is the probability of getting exactly 6 mistakes in a particular 3-page section of the book?

4. Suppose that over the long run a manufacturing process produces 1% defective items. Use the Poisson approximation to the binomial distribution to calculate the probability of getting two or more defectives in a sample of 200 items.

EXTRA CREDIT BONUS PROBLEM (worth 2 points): no partial credit  *If you submit a solution to this problem, please submit it on a separate piece of paper)*

Suppose John and Mary take turns at rolling a die to see who can roll the first “6”. Suppose John rolls first. What is the probability that Mary wins the game?