Recitation 5
September 18, 2008

1. Problem 2.22, page 123 in the text.

   Two coins are simultaneously tossed until one of them comes up a head and the other a tail. The first coin comes up a head with probability p and the second with probability q. All tosses are assumed independent.

   (a) Find the PMF, the expected value, and the variance of the number of tosses.

   (b) What is the probability that the last toss of the first coin is a head?

2. Problem 2.7, page 120 in the text.

   You just rented a large house and the realtor gave you 5 keys, one for each of the 5 doors of the house. Unfortunately, all keys look identical, so to open the front door, you try them at random.

   (a) Find the PMF of the number of trials you will need to open the door, under the following alternative assumptions: (1) after an unsuccessful trial, you mark the corresponding key, so that you never try it again, and (2) at each trial you are equally likely to choose any key.

   (b) Repeat part (a) for the case where the realtor gave you an extra duplicate key for each of the 5 doors.

3. Problem 2.20, page 123 in the text.

   As an advertising campaign, a chocolate factory places golden tickets in some of its candy bars, with the promise that a golden ticket is worth a trip through the chocolate factory, and all the chocolate you can eat for life. If the probability of finding a golden ticket is p, find the mean and the variance of the number of candy bars you need to eat to find a ticket.