Stat 2470, Quiz #3, Fall 2014 Name KEY

Instructions: Show all work. Use exact answers or appropriate rounding conventions. If you use your calculator, you can show work by saying which calculator commands you used.

1. For each random variable described here, describe the set of possible values for the variable, and state whether the variable is discrete.
   a. X is the number of unbroken eggs in a randomly chosen egg carton.

   0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 discrete

   b. X is the length of a randomly selected rattlesnake.

   (0, max length?) Continuous

   c. X is the total number of coin tosses required for three individuals to obtain a match. (i.e. HHH, or TTT).

   0, 1, 2, 3, 4, ... discrete

2. A mail order company has six telephone lines. Let X denote the number of lines in use at a specific time. Suppose the probability mass function of X is as given in the accompanying table.

x	0	1	2	3	4	5	6
$p(x)$	0.10	0.15	0.20	0.25	0.20	0.06	0.04

   a. What is the probability that at most three lines are in use?

   .1 + .15 + .2 + .25 = .70

   b. What is the probability that between two and five (inclusive) lines are in use?

   .2 + .25 + .2 + .06 = .71

   c. What is the probability that at least four lines are in use?

   .20 + .06 + .04 = .30

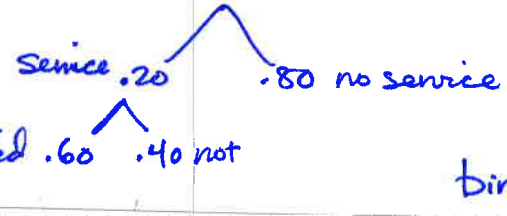
   d. What is the expected value of X?

   $0(.1) + 1(.15) + 2(.20) + 3(.25) + 4(.20) + 5(.06) + 6(.04) = 2.64$

   e. What is the variance of X?

   2.37

3. Twenty percent of all telephones are submitted for service under warranty. Of these, 60% can be repaired. If a company purchases 10 of these phones, what is the probability that exactly two will be end up being replaced (i.e. not repaired) while under warranty?



(.20)(.40) = .08 replaced

$\binom{10}{2}(.08)^2(.92)^8 = .1478$

binomialpdf(10, .08, 2)