HW 7 is due on Friday, Oct. 11. Exam 2 is on Wednesday, Oct. 16. Last day to drop this course with advisor is Friday, Oct. 25 (Sunday oct. 27 online). **One page: problems A)- C)**

A) 13.8ab When an opinion poll or telemarketer calls residential telephone numbers at random, 20% of the calls reach a live person. You watch the random dialing machine make 15 calls. The number that reach a person has a binomial distribution with $n = 15$ and $p = 0.2$.

a) What is the mean number of calls that reach a person?

b) What is the standard deviation σ of the count of calls that reach a person?

comment: See p. 346.

B) 13.24 In a test for ESP (extrasensory perception), a subject is told that cards the experimenter can see but he cannot contain either a star, a circle, a wave or a square. As the experimenter looks at each of 20 cards in turn, the subject names the shape on the card. A subject who is just guessing has probability of 0.25 of guessing correctly on each card.

a) The count of correct guesses in 20 cards has a binomial distribution. What are n and p?

b) What is the mean number of correct guesses in many repetitions?

c) What is the probability of exactly 5 correct guesses?
comment: See p. 344. In c) do not simplify the formula much.

C) Here is a simple probability model for multiple choice tests. Suppose that a student has probability p of correctly answering a question chosen at random from the pool of possible questions. (A strong student has a higher p than a weak student.) Answers to different questions are independent. Jodi is a good student for whom $p = 0.75$.

a) Use the normal approximation to find the probability that Jodi sores 70% or lower on a 100 question test.

b) Use the normal approximation to find the probability that Jodi sores 70% or lower on a 250 question test.

comment: See p. 348 - 350. The sample size n is the number of questions. Answers are near 0.13 and 0.03.
In a) 70% or lower means $X \leq .7(100) = 70$.
In b) 70% or lower means $X \leq .7(250) = 175$.