Math 102
Exam 4 Practice Problems

1. List the 4 properties an experiment must satisfy in order to be a binomial experiment

2. Suppose you are going to take a multiple choice test which has 8 questions, with each question having 4 options to choose from. Since you did not have time to study, you decide to answer by randomly guessing each answer.

   (a) Find the probability of getting **exactly** 6 questions right.
   (b) Find the probability of getting **at least** 6 questions right.
   (c) What number of questions would you be most likely to get right?

3. A group of researchers wishes to find out which professional sport is currently the most popular in the United States. To shed some light on this, they decide to go to the Mall of America on a Sunday afternoon and ask people the following question: "Is football your favorite professional sport, or do you prefer a different sport like basketball, baseball, hockey, or soccer?" Although some people refuse to answer their question, they eventually get 100 responses. Of those that responded, 53 prefer football, 20 prefer basketball, 18 prefer baseball, 7 prefer hockey, and 2 prefer soccer.

   (a) What is the population in this survey? What is the sample?
   (b) What forms of bias, if any, may have effected the data collected in this survey? Explain your reasoning.
   (c) Based on this study, what conclusions, if any, can be reached about which sport is most popular in the United States today? Explain your reasoning.

4. (a) Give an example of a real life situation where the mean is the most appropriate measure of central tendency.
   (b) Give an example of a real life situation where the median is the most appropriate measure of central tendency.
   (c) Give an example of a real life situation where the mode is the most appropriate measure of central tendency.

5. A company with 19 employees has a mean salary of $38,000. Suppose a new employee is hired at a salary of $28,000

   (a) What is the mean salary for the employees in this company after the new hire?
   (b) What, of anything can we determine about the impact of this new hire on the median salary in this company? Explain your reasoning.

6. Given the data set $\{4, 11, 17, 25, 23, 19, 17, 7, 38, 20\}$

7. (a) Find the mean, mode, and midrange of this data set.
   (b) Make a stem and leaf display for this data set.
   (c) Find the 5 number summary of this data set.

8. Given the following frequency table: Relative Frequency Histogram:

x	frequency	rel. freq
4	3	
6	7	
8	5	
12	2	
15	3	

   (a) Complete the relative frequency column in the table given above.

   (b) In the space provided above, make a relative frequency histogram for the data in the table above.

   (c) Compute the mean and median of the data in this table.

9. Find the mean and standard deviation of the data set: $\{2, 5, 7, 12, 14\}$

10. Suppose Stock A had a average price of $25.50 last year, with a standard deviation of $3.50, which Stock B had an average price of $76.00 last year, with a standard deviation of $10.

   (a) Find the coefficient of variance for each of these stocks last year.

   (b) Which stock was more volatile? Explain your reasoning.

11. Suppose that 500 test scores (on a 100 point test) are approximately normally distributed with a mean of 68, and a standard deviation of 8.

   (a) What percentage of scores are above 80 points?

   (b) How **many** scores are below 60 points?

   (c) What percentage of scores are between 70 and 90 points?

   (d) What score would a person need to get on the test in order to have scored higher than 80% of the people who took this test?