1. Draw a Venn Diagram with numbers (probabilities) that describe
   a) mutually exclusive events
   b) independent events

2. Write down the formula for
   a) \( P( A \cup B ) = \) ________________________________
   b) \( P( A \mid B ) = \) ________________________________
   c) Binomial Formula : \( P( x \text{ successes } ) = \) ________________________________

3. A Bernoulli experiment is an experiment that has ______ outcomes they are _____________________________

4. When \( n \) independent trials of a Bernoulli Experiment are performed, we call the experiment a ________________
   experiment.

5. A person types letters at random. The probability that the letter \( j \) is hit is \( 1/15 \). If he hits four keys and each time is
   independent from the other, then
   a) Describe the Bernoulli Trial: ________________________________
      Define your success: ________________________________
      Find \( p = \) __________
   b) what is the probability that you will strike the letter \( j \) twice? ______________
      at least once? ______________
6. A __________________________ is when we assign a numerical value to each outcome.

There are three types of r.v. we discussed in class they are continuous r.v., infinite discrete r.v., and __________________________

7. A binomial r.v. X with p = ½, n = 12 has

a) what values for X? X: ______________________________________________

b) What is the expected value? (the long term average) __________________________

c) The variance _______________________

d) the standard deviation __________________

8. Construct a probability distribution for X if X is a binomial r.v. with p = ½ and n = 3.

a) Probability distribution:


b) mean (expected value):

c) variance and standard deviation:

9. In general we can find the expected value (mean, μ) and the variance (σ²) of a variable – but not as easy or quick as for a binomial r.v.

Find the mean and the variance of
10. A student gathers data as to the number of times that the number of colds a student gets during the year. out of 40 students

2 have had no colds, 8 have had one, 26 have had two, 4 have had three

Find (in terms of the number of colds)

a) mode: b) median

c) arithmetic mean

11. Given the data

1, 2, 2, 1, 1, 4 find

a) median b) average squared deviation

c) standard deviation: population

12. A random sample is taken of 100 students as to how many hours they sleep- at night

50 sleep 8, 20 sleep 9, 30 sleep 7

Find sample standard deviation

13. Four cards are drawn. Find the probability that

a) exactly three are aces

b) At least one is an ace

c) If replacement (repetitions) is allowed, then what is the probability of exactly three aces?
14. One out of every 5 pets dropped (found) at the humane society happens to be fixed. 
   We assume that each animal brought in has the same probability of being fixed (independence!!)

   During the first week of the month 20 animals were brought in.
   a) How many of the twenty pets do you expect to be fixed? ______________
   b) What is the probability that
      six of the pets are fixed? ________________
      at least one of the pets is fixed? ______________

15. Some problems similar to the HW beginning with those on page 527 – you are responsible for those type of problems.

   Also,

16. Three people sit around a table.
   What is the probability that at least two of the three have a birthday on the same day (month–day)

17. #27, #28 page 539 in your text (Bayes’ formula)

18. Simplify (completely) - Show all work
   \[ \binom{200}{198} = \text{______________} \quad \text{P}(300, 2) = \text{______________} \]
   \[ \frac{(n+2)!}{(n)!} = \text{______________} \quad n! - (n-1)! = ? \text{______________} \]

The rest of the problems listed describe possible types of problems – either HW problems or similar to the HW problems

19. 
   #35 page 547 
   #44/547 
   #51/547 
   #53/547

20. 
   #33/552 
   b) #27/552 
   #29/552 
   d) #26/552 
   #15/552
21
   a) #1/560  b) #9/560

22.
   #14/575  #23/576

26.
   #4/590  #20/590

   #25/591

27. #33/601