Week 1 Review Worksheet

Note: Some of these are a little tougher than in-class problems. You have all the tools you need to solve these problems. ☺

Probability

1) There are 3 red balls, 1 green ball, and 2 yellow balls in an urn.
    a) What is the probability of drawing a green ball? (p(Green))
    b) p(Red)?
    c) If you draw two consecutive balls from the urn without replacement, what is the probability of drawing both yellow balls?
    d) Again, drawing two consecutive balls without replacement, what is the probability of not drawing the green ball?
2) You are attending an badly managed award ceremony and the plate of food you get is random. Here are some details for the likelihood of various foods.
    - There are three types of entrees served at the dinner: Chicken, Fish, and Vegetarian.
    - Chicken is served 50% of the time and Fish is served 20% of the time.
    - Each entree is either served with asparagus or a sweet potato.
    - The probability of being served Chicken AND a sweet potato is 0.3.
    - Given that a guest is served fish, the probability of a sweet potato is 0.35.
    - Asparagus and a sweet potato are equally likely to be served as sides, given that the vegetarian entrée is served.
    a) Draw out either a tree or a probability table (your preference), and circle the parts of each branch of the tree or each cell that you need to find.
    b) What is p(Vegetarian)?
    c) What is the p(sweet potato | chicken)?
    d) Using the answer to part c, solve for p(asparagus|chicken) and use that to find the probability that chicken AND asparagus are served (also called Total Probability)
    e) Complete the tree or table with the conditional and absolute probabilities for vegetarian entrée and its sides.

f) Complete the tree or table for conditional and absolute probabilities for the sides served with fish.

g) Are the probabilities for sides and entrees independent?

h) Given that Asparagus was serves, what is the probability that the entrée was chicken?

3) You are a high school gym teacher and the school currently has no sports teams. You have 24 students in your gym class and want to see how well they play at a few different types of sports.

   a. First you want to try basketball. You will select one team of five first and let's assume that order doesn't matter in basketball.

      i. How many ways are there to select the first team of five?

      ii. After the first team is selected, how many ways are there to choose the second team?

   b. Now, try tennis. Every player in tennis should feel comfortable playing close to the net and also along the baseline (Meaning that order doesn't matter).

      i. How many different teams of two can you make (without replacements)?

      ii. You're getting ahead of yourself and imagining the championship picture. How many ways could you line up the potential doubles teams (your answer from the previous part) in a photo?

   c. Lastly, you'd like to play some football. Unlike basketball and tennis, players in football are usually in very specific roles. Assuming that 11 players are on the field for each team at a given time, answer the following:

      i. First, choose players for team A. How many different teams could you make?

      ii. Once team A is already built, how many ways could you make team B?