

# APMA 1650 – Review Session 1

Friday, July 8, 2016

Some of the problems I will go over in the review session are from the recitation sheet. Here are some other problems.

1. You have 5 different and distinguishable pairs of socks in your drawer. If you randomly select four socks from the drawer, what is the probability that there is no matching pair?
2. Suppose we have a group of 22 high school students. We will divide them into two teams of 11 to play soccer.
  - (a) If we divide them into a JV (junior varsity) and varsity team, how many ways are there to do this.
  - (b) If we divide them into two soccer teams, how many ways are there to do this?
3. At a certain intersection, the a traffic light is red for 15 seconds, yellow for 5 seconds, and green for 30 seconds.
  - (a) Find the probability that out of the next 10 cars which arrive randomly at the light, exactly 4 will be stopped by a red light.
  - (b) What is the expected number of the next 10 cars which will be stopped by the light. What is the variance?
4. A bag contains 20 marbles; 5 are red and 15 are white. You draw marbles from the bag one at a time, replacing them after each draw.
  - (a) If you make 10 draws from the bag, what is the probability that fewer than 3 of them will be red?
  - (b) What is the expected value and variance of the number of red balls drawn out of 10?

Now suppose you keep drawing from the bag (with replacement) until you get a red ball.
  - (c) What is the probability that you will get a red ball on the first 3 draws?
  - (d) What is the probability that it takes longer than 10 draws to get a red ball?

- (e) What is the expected value and variance of the number of draws it takes to get the first red ball?
5. Suppose I make an average of 2 spelling mistakes per page in my class notes. Modeling this with an appropriate probability distribution, what is the probability that any given page has 2 or fewer spelling mistakes on it?