MATH/STAT 414 HW 1

due January 22, 2015

1. (a) How many different 7-place license plates are possible if the first 2 places are for letters and the other 5 for numbers?

    (b) Repeat part a under the assumption that no letter or number can be repeated in a single license plate.

2. Twenty workers are to be assigned to 20 different jobs, one to each job. How many different assignments are possible?

3. For years, telephone area codes in the US and Canada consisted of a sequence of three digits. The first digit was an integer between 2 and 9, the second digit was either 0 or 1, and the third digit was any integer from 1 to 9. how many area codes were possible? How many area codes starting with a 4 were possible?

4. Note for this problem that the boys and girls are each uniquely identifiable.

    (a) In how many ways can 3 boys and 3 girls sit in a row?

    (b) In how many ways can 3 boys and 3 girls sit in a row if the boys and the girls are each to sit together?

    (c) In how many ways if only the boys must sit together?

    (d) In how many ways if no two people of the same sex are allowed to sit together?

5. A child has 12 blocks, of which 6 are black, 4 are red, 1 is white, and 1 is blue. if the child puts the blocks in a line, how many arrangements are possible.

6. Consider a group of 20 people. If everyone shakes hands with everyone else, how many handshakes take place?

7. A student has to sell 2 books from a collection of 6 math, 7 science, and 4 economics books. How many choices are possible if

   (a) both books are to be on the same subject?
   (b) the books are to be on different subjects?

8. A person has 8 friends, of whom 5 will be invited to a party.

   (a) How many choices are there if 2 of the friends are feuding and will not attend together?
   (b) How many choices if 2 of the friends will only attend together?

9. If 12 people are to be divided into 3 committees of respective sizes 3, 4, and 5, how many divisions are possible?