Worksheet #1--The Counting Principle & Intro to Probability

1. How many four letter patterns can be formed using the letters X, Y, and Z if letters may be repeated?
   81
2. At the burger shack you can order a burger rare, medium, or well done. It can be plain or have one of these toppings: onions, relish, mayonnaise, cheese, ketchup, or tomato. How many different kinds of burgers can you order?
   21
3. How many ways can five cars be parked along the street if there is only one red car which must be parked in the middle?
   24
4. The letters A, B, C, and D are used to form four-letter passwords for entering a computer file. How many passwords are possible if letters can be repeated any number of times?
   256
5. How many ways can the first five letters of the alphabet be arranged if each is used only once?
   120
6. A restaurant serves five main dishes, three salads, and four desserts. How many different meals could be ordered if each person has a main dish, a salad, and a dessert?
   60
7. How many different ways can four books be arranged on a shelf?
   24
8. How many four-digit positive even integers are there?
   4500
9. How many license plate numbers consisting of three letters followed by three numbers are possible when repetition is allowed?
   17,576,000
10. How many combinations are possible using the information in problem #9 if no repetition is allowed?
    11,232,000
11. A golf club manufacturer makes irons with seven different shaft lengths, three different grips, five different lies, and two different club head materials. How many different combinations are offered?
    210
12. In how many ways can the four call letters of a radio be arranged if the first letter must be W or K, and no letters may be repeated?
    27,600
13. Consider a fair die.
    A. What is the probability of rolling a six? $1/6$
    B. What is the probability of rolling an odd number? $1/2$
    C. What is the probability of rolling a number larger than four? $1/3$
14. Given two fair dice, find the probability of rolling a sum of 8 on the two dice. $5/36$
15. Consider a standard deck of cards.
    A. What is the probability of drawing an ace of hearts? $\frac{1}{52}$
    B. What is the probability of selecting a queen? $\frac{1}{13}$
    C. What is the probability of selecting a club? $\frac{1}{4}$
    D. What is the probability of selecting a black card? $\frac{1}{2}$