**Lab 1 for Sections 12.9 & 12.10** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Use good notation and show appropriate work. First, set up all problems. Second, simplify set ups. Third,* ***if time****, compute the solutions.*

1. Find the volume of a box with height  2.  of what number is 156?

feet, width  feet and length  feet.

3. Evaluate each of the following.

(a) 6! = (c) *P*(7, 3) =

(b)  (d) 7*C*3

4. How many different passwords can be formed by rearranging the letters from MATHEMATICS?

5. (a) In how many ways can a club elect a president, vice-president, secretary, and treasurer if there are twelve club members? (A person may not hold more than one position.)

(b) In how many ways can a club form a committee of four if there are twelve club members?

6. (a) How many distinct hands consisting of five hearts can be formed from a standard deck of cards?

(b) What is the probability of being dealt a hand consisting of five hearts?

7. In 2014, the U. S. Senate consists of 45 Republicans, 53 Democrats, and 2 independents. How many ways can a committee consisting of 3 Democrats, 2 Republicans, and 1 independent be formed?

8. In 2014, the Minnesota Senate consists of 28 Republicans and 39 Democrats. What is the probability of randomly selecting members for a committee consisting of 3 Democrats and 2 Republicans?

9. A shelf can hold five books. You have a box containing eight books.

(a) How many arrangements on the shelf are possible for five books chosen from the box?

(b) How many possible groups of five books may be chosen to place on the shelf?

(c) You want a particular set of five books to be placed on the shelf. What is the probability of randomly selecting those five books from the box?