## Lab for Sections 13.3

Use good notation and show appropriate work. State your solutions to problems in complete sentences.

- 1. Evaluate each of the following.
  - (a) 9! =

(c) P(9, 3) =

(b)  $\frac{9!}{3!4!} =$ 

(d)  ${}_{9}C_{3}$ 

2. How many different ordered arrangements can be formed on a shelf with space for 3 books if there are 6 different books available?

3. How many distinct hands consisting of five hearts and eight spades can be formed from a standard deck of cards?

4. A station wagon has 8 seats (plus the driver's seat). In how many ways can five passengers be seated in the eight seats?

5. In how many ways can a little league coach make out a batting order consisting of 9 players if there are 12 players on the team?

6.	A person with last name Aaransan has used the letters of her name for an eight letter password. If each letter is used exactly once and it is not case sensitive, how many different passwords can be formed?
7.	In 2011, the U. S. Senate consists of 47 Republicans, 51 Democrats, and 2 independents. How many ways can a committee consisting of 6 Democrats/independents and 5 Republicans be formed in the U. S. Senate if the two independents caucus with the Democrats?
8.	A jury of twelve people is to be selected from a jury pool consisting of nine men and eleven women. How many different ways can the jury be formed that consists of five men and seven women?
9.	In 2011 the U. S. House of Representatives consists of 193 Democrats and 241 Republicans. How many ways can the positions of Speaker of the House, Majority Leader, and Minority Leader be chosen. (Assume the Speaker of the House is chosen from the majority party.)
10.	How many different passwords can be formed by rearranging the letters from MATHEMATICS?