You MUST use good notation **Math 102** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

and show appropriate work. (Section 13.1) ***Due Oct. 12th***

**13.1 Introduction to Counting Methods**

1. In how many different ways can one select a certain automobile if it comes in 3 different body styles, 2 different engines, and 5 different colors?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. How many different license plates can be made if they must start and end with a letter and contain 3 digits between the two letters?

3. Suppose we consider families having 3 children. Draw a tree diagram which reveals all possible birth sequences for the children. (Example: one sequence is GGB, which means the oldest child is a girl, the middle child is a girl and a youngest is a boy.)

In how many of the above sequences

a) does the family have more boys than girls? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) is the youngest child a girl? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) does the family have exactly one boy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) does the family have no girls? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e) does the family have all children the same gender? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. In how many different ways can five people be seated in a row having 5 chairs?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Suppose four digit numbers are formed using digits from {3, 4, 5, 6, 7}. How many different four digit numbers can be formed if

a) we allow repetition of the digits in each number? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) repetition of digits is not allowed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Suppose we wish to form three digit **even** numbers using only the digits from {3, 4, 5}. In each of the following first **construct** a tree-diagram. How many ways can these numbers be formed if

a) repetition of digits is not allowed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) repetition of digits is allowed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Assume you wish to take a mathematics class, an English class and a history class (all three). As there are multiple sections of each class you can build your schedule. Use a tree diagram to find the possible schedules that you can build. Then list them. Assume the list of classes you can choose from are:

Mathematics 8:00, 9:00, 10:00

English 8:00, 10:00

History 9:00 10:00