1. How many license plates with five digits can be made if no plate starts with zero? Suppose the first digit is replaced with a letter and the second digit is not a zero. Now how many plates can be made?
2. Ten points are taken on the circumference of a circle. How many chords can be drawn by joining them in all possible ways? With these ten points as vertices, how many triangles can be drawn? How many hexagons?
3. A standard deck of playing cards has 52 different cards. A poker hand consists of 5 cards. How many different possible poker hands are there?
4. There are 13 cards of each suit (spades, hearts, diamonds, clubs) in a standard deck. How many different hands of 13 cards can be made from five spades, four hearts, two diamonds, and two clubs?
5. In how many ways can four persons be selected from five married couples if
   (a) the selection must consist of two women and two men?
   (b) if a husband and wife cannot both be selected?
6. How many five letter "words", each consisting of three consonants and two vowels, can be formed from the letters of the word `equations`? (NOTE: A word consists of any arrangement of letters, whether or not it forms a real word.)
7. How many permutations can be made using the letters of the word `institution`, taken all at a time? How many of these begin with `t` and end with `s`?
8. Find the number of ways in which nine 3's and six 5's can be placed in a row so that no two 5's come together.
9. Find the number of arrangements of the letters of the word `engineering`, taken all together. In how many of these are the three `e`'s together? In how many are exactly two `e`'s together?
10. In how many ways can ten identical flags be arranged on a row of six flagpoles, if at least one flag must appear on each pole?
11. In how many ways can seven keys be placed on a key ring?
12. A metallurgist, studying alloys, wants to study the effect of three different temperatures, six different heating times, and four different amounts of a copper compound. One experiment has one level for each variable. How many different experiments must the metallurgist perform if every possible triple of temperature level, heating time, and amount of copper is to be represented?
13. In the World Series, the American League team (A), and the National League team (N), play until one team wins four games. How many different winning sequences are there for the two teams? (For example, NAAAA means the American League team won in five games, NNANN means the National League team won in five games.)
14. A bug walks along the grid shown below. The bug always heads towards point A. In how many ways can the bug get from point O to point A always going through point B?