MA 110 WORKSHEET (7.3)

Name _____Solutions_____

1.    Noting that there are 26 letters in the English alphabet and 10 digits.  How many different license plates can a state make if each license plate contains:

   A.    7 different digits?

         10*9*8*7*6*5*4 = 604,800

   B.    7 digits with repeats permitted?

         $10^7$ = 10,000,000

   C.    3 letters followed by 3 digits, repeats permitted?

         $26^3*10^3$ = 17,576,000

2.    Suppose a person planning a banquet cannot decide how to seat 6 guests at the head table.  How many ways can they be seated in the 6 chairs on one side of the table?

      6! = 6*5*4*3*2*1 = 720

3.    Eight horses are entered in a race.  How many ways can the horses finish?

      8! = 8*7*6*5*4*3*2*1 = 40,320

4.    The call letters for radio stations must begin with K or W followed by any 3 additional letters.  How many sets of call letters are possible?

      $2*26^3$ = 35,152

5.    How many different outfits can be formed from

   A.    4 pairs of pants and 6 shirts?

         4*6 = 24

   B.    4 pairs of pants, 6 shirts, and 3 sweaters?

         4*6*3 = 72

6.  An automobile manufacturer produces 7 models, each available in 6 different colors.  In addition, the buyer can choose one of 4 different upholstery fabrics and one of 5 different colors for the interior.  How many varieties can be ordered from the manufacturer?

    7*6*4*5 = 840

7.  How many different ways can 10 questions on a true-false test be answered?

    $2^{10}$ = 1024

8.  How many different arrangements can be made with the letters, M, A, T, H, if:

    A.  each letter can be used only once?

        4*3*2*1 = 24

    B.  each letter can be used more than once?

        4*4*4*4 = 256

9.  How many 7-digit telephone numbers can be formed if the first digit cannot be a 1 or 0?

    $8*10^6$ = 8,000,000

10. How many different 7-digit telephone numbers begin with 587 or 589?

    $2*10^4$ = 20,000

11. How many 3-letter code words can be formed if the middle letter must be a vowel?

    26*5*26 = 3,380

12. Make up your own counting problem and solve it.