1) When a die is rolled twice, there are __6 x 6 =36__ possible outcomes.   1) ___D___

   A) 18   B) 720   C) 6   D) 36

   Fundamental Counting Rule: In a sequence of n events in which the first one has k1 possibilities and the second event has k2 and the third has k3, and so forth, the total number of possibilities of the sequence will be: k1 x k2 x k3 ...kn

2) A furniture manufacturer offers bookcases in 4 different sizes and 4 different colors. If   2) ___A___
   every color is available in every size, then the total number of different bookcases is

   __4 x 4 = 16___.

   A) 16   B) 8   C) 32   D) 4

3) A business has seven locations to choose from and wishes to rank only the top three   3) ___C___
   locations. How many different ways can this be done?

   A) 5,040   B) 420   C) 210   D) 840

   Out of 7, choosing 3, order of selected items is taken into consideration: 7P3 = 210

4) How many different ways can a teacher select 3 students from a class of 15 students to   4) ___D___
   each perform a different classroom task?

   A) 455   B) 45   C) 1320   D) 2730

   Out of 15 choosing 3, order of students taken into consideration (each student a different task): 15P3 = 2730

5) How many different ways can a teacher select 4 students from a class of 17 students to   5) ___D___
   each perform the same classroom task?

   A) 57,120   B) 68   C) 17,160   D) 2380

   Out of 17 choosing 4, order of students not taken into consideration (each student same task): 17C4= 2380

6) If the letters A, B, C, D, E, and F are to be used in a five-letter code, how many different   6) ___D___
   codes are possible if repetitions are *not* permitted?

   A) 7,776   B) 1,296   C) 625   D) 720

   Six letters to choose from (A, B, C, D, E, F): in a code, order matters. Out of 6, choose 5: 6P5 = 720

7) The Foreign Language Club is showing a movie marathon of subtitled movies. How   7) ___C___
   many ways can they choose 5 from the 13 available?

   A) 154,440   B) 120   C) 1287   D) 1560

   Out of 13, choose 5 movies. Order in which club members watch the movies, is irrelevant: 13C5 = 1287

8) A researcher wishes her patients to try a new medicine for depression. How many   8) ___D___
   different ways can she select 5 patients from 45 patients?

   A) 120   B) 5400   C) 146,611,080   D) 1,221,759

   Out of 45, choosing 5; order is irrelevant: 45C5 = 1,221,759

9) How many ways can a student select five questions from an exam containing 12   9) ___B___
   questions, if one of the five must be the last question?

   A) 7920   B) 330   C) 95,040   D) 40,320

   If one of the questions must be the last one, then the student only needs to select 4 out of 11 =>   11C4 = 330

10) How many different ways can four people: Andy, Betty, Cindy, and Doug, sit in a row at   10) ___A___
    the opera if Andy and Betty must sit together?

    A) 12   B) 24   C) 6   D) 18

    Since Andy and Betty must be together, think of this couple as one person; therefore, we need to arrange 3 people in a row, that is given by
    3! or 3P3 = 6. Now, Andy and Betty may be arranged in two different was (2!), that is, Andy to the left, Betty to the right or the other way
    around. In summary: we have 6 ways to arrange all of them in a row, times 2 ways to arrange the couple => 6 x 2 = 12

11) There are four instructors, nine assistant professors, and five associate professors in the   11)   A

Math department. A committee of five is selected to choose new textbooks. How many are there in which a committee can be selected, if there must be one instructor, two assistant professors, and two associate professors on the committee.

    A) 1,440   B) 95

Choose 1 instructor out of 4 instructors, 2 assistant prof out of 9 & 2 associate prof out of 5 ==> 4C1 x 9C2 x 5C2 = 1,440

12) *A known* soda brand comes in two varieties, regular and diet. If a researcher has 5 boxes   12)   A

of each, how many ways can he select 2 boxes of each for a quality control test?

    A) 100   B) 50   C) 49   D) 10

Choose 2 out of 5 from one variety, Choose 2 out of 5 from the other variety ==> 5C2 x 5C2 = 100