1. Answer each of the following questions. You don’t need to show your work.

   a. How many permutations are there of the word committees?

   b. Consider a group of 50 people. If everyone shakes hand with everyone else, how many
      handshakes take place? Your answer must be in a closed form.

   c. A committee of 7, consisting of 2 Republicans, 2 Democrats, and 3 Independents, is
      to be chosen from a group of 5 Republicans, 6 Democrats, and 4 Independents. How
      many committees are possible?

   d. How many ways are there to place 8 nonattacking identical rooks on a 8×8 chessboard?
      (In chess two rooks can attack one another if and only if they lie in the same row or
      the same column of the chess board.)

   e. Answer the above question if the rooks are distinguishable.

   f. Answer the above question if there is 1 red, 3 blue, and 4 yellow rooks.

   g. A student has 3 mangoes, 2 papayas, and 2 kiwi fruits. If the student eats one piece
      of fruit each day, and only the type of fruit matters, in how many different ways can
      these fruits be consumed?

   h. How many different strings can be made from the letters AARDVARK, using all the
      letters, if all three A’s must be consecutive?

   i. How many different bit strings can be formed using six 1s and eight 0s?

   j. How many strings of 10 ternary digits (0, 1, 2) are there that contain exactly two 0s,
      three 1s, and five 2s?

      For the next three questions consider the following scenario: From a group of 8 women
      and 6 men a committee consisting of 3 men and 3 women is to be formed.

   k. How many different committees are possible if two of the men refuse to serve together?
1. How many different committees are possible if two of the women refuse to serve together?

m. How many different committees are possible if one man and one woman refuse to serve together?

n. We roll two dice. How many different outcomes are possible if the two dice are distinct?

o. How many different outcomes are possible if the two dice are identical?

2. In how many ways can you write abstemious in such a way that the vowels follow their natural order a, e, i, o, u. For example, you are allowed to write basesimout but not besasimout.