Practice – Multiplication Principle; Permutations

1. Without using a calculator, evaluate the following expressions:

   a. 7!

   b. P(5,3)

2. If I own 4 shirts, 5 sweaters, 7 pairs of pants, and two pairs of shoes how many outfits can I make if an outfit consists of 1 shirt, 1 sweater, 1 pair of pants, and one pair of shoes?

3. How many four-letter passwords can be formed from the letters {A,B,J,K,X,Z}?

   a. if a letter can be repeated?

   b. if a letter cannot be repeated?

4. A quiz consists of 5 multiple-choice questions with 4 possible responses to each one. In how many different ways can the quiz be answered?

5. From a class of 35 people a president, vice-president, secretary, and treasurer are to be elected. In how many different ways can these offices be filled?

6. How many different distinguishable permutations (9-letter words - real or imaginary) can be formed from the letters in the word COMMITTEE?