

Counting principles practice

1. In how many ways can we choose five people from a group of ten to form a committee?

2. How many seven-element subsets are there in a set of nine elements?

3. There are three different routes connecting city A to city B.
 - a. How many ways can a round trip be made from A to B and back?

 - b. How many ways if it is desired to take a different route on the way back?

4. In arranging people around a circular table, we take into account their seats relative to each other, not the actual position of any one person. Show that n people can be arranged around a circular table in $(n - 1)!$ ways.

5. Five people get on an elevator that stops at five floors. Assuming that each has an equal probability of going to any one floor, find the probability that they all get off at different floors.

6. A certain state has license plates showing three numbers and three letters. How many different license plates are possible

a. if the numbers must come before the letters?

b. if there is no restriction on where the three letters and three numbers appear?