Tutorial – Week 11

The phrase **at least n** *means* "n or more."

The phrase **at most n** *means* "n or fewer."

1. How many permutations of the letters **ABCDEFGH** contain the string **ABC**?

2. Suppose that a saleswoman has to visit **eight different cities**.

She must begin her trip in a specified city, but she can visit the other seven cities in any order she wishes.

How many possible orders can the saleswoman use when visiting these cities?

3. In how many ways can we select *three students* from a group of five students to stand in line for a picture?

In how many ways can we arrange *all five of these students* **in a line** for a picture?

4. Find the number m of *seven-letter words* that can be formed using the letters of the word "**BENZENE**."

5. Three cards are chosen one after the other from a 52-card deck. Find the number *m* of ways this can be done:

(a) **with** replacement.

(b) **without** replacement.

6. A group of 30 people have been trained as astronauts to go on the first mission to Mars.

How many ways are there to select a crew of six people to go on this mission (assuming that all crew members have the same job)?

7. What is the total number of ways in which 5 balls of different colors can be distributed among 3 people so that each person gets **at least** one ball?

8. A coin is flipped 10 times where each flip comes up either heads or tails.

How many possible outcomes:

a) are there in total?

b) contain **exactly** two heads?

c) contain **at most** three tails?

d) contain **the same number** of heads and tails?

9.

a). How many distinguishable ways can the letters of the word **HULLABALOO** be arranged in order?

b). How many distinguishable orderings of the letters of **HULLABALOO** begin with **U** and end with **L**?

c). How many distinguishable orderings of the letters of **HULLABALOO** contain the two letters **HU** next to each other in order?

10. Suppose the group of twelve consists of five men and seven women.

a. How many five-person teams can be chosen that consist of **three men** and **two women**?

b. How many five-person teams contain **at least** one man?

c. How many five-person teams contain **at most** one man?