
Series 3

Exercise 1

Establish the formula $n \geq p$:

$$1/ C_n^p = C_{n-1}^p + C_{n-1}^{p-1}$$

$$2/ C_n^k P_k = A_n^k$$

Exercise 2

A Woman has in her wardrobe 4 skirts, 5 blouses and 3 jackets.

She randomly chooses a skirt, a blouse and a jacket.

How many different ways can she dress?

Exercise 3

A shelf contains 12 books, including 5 on Mathematics, 3 on Physics, 2 on chemistry and 2 on general knowledge

1/ Give the number of possible arrangements for storing these 12 books.

2/ If we want to keep books of the same subject together, in how many ways can we do it?

Exercise 4

- 1/ How many of the 3 digits are different among 1, 2, 3, 4, 6, 8
- 2/ How many even numbers are there?
- 3/ How many odd numbers are there?
- 4/ How many even numbers start with 1?

Exercise 5

3 balls are drawn simultaneously, one from an urn containing 3 black balls, 4 white balls and 3 red balls.

- 1/ How many different ways can this draw be done?
- 2/ How many different ways can we draw 1 black ball, 1 white ball and 1 red ball?
- 3/ How many different ways can we draw 3 balls of which only 2 are white?
- 4/ How many different ways can we draw 3 balls where at least 1 ball is white?
- 5/ How many different ways can we draw at most 2 white balls?

Exercise 6

- 1/ Count the anagrams of the word university
- 2/ In each of the following cases, Count the anagrams of the word university:
 - a/ Beginning and ending with a consonant
 - b/ Beginning and ending with a vowel
 - c/ Beginning with a consonant and ending with a vowel
 - d/ Beginning with a vowel and ending with a consonant

Exercise 7

1/ In how many ways can 5 girls and 3 boys be arranged side by side if :

a/ There are no restriction

b/ The 3 boys must be together

c/ The 3 boys must be separated

2/ In how many ways can 5 girls and 3 boys be arranged around a circular table

Exercise 8

Develop $(3x + y^2)^7$