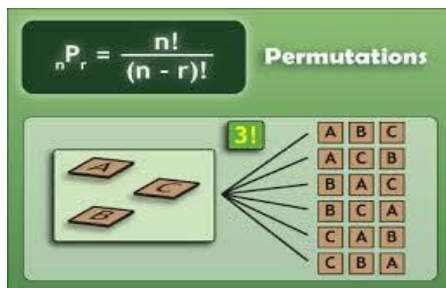


Goals

By the end of this week, you should be able to:

- Use ${}^n P_r$ to count number of possible arrangements (permutations)
- Compute number of ways of arranging n objects which include p identical objects of one type, q identical objects of another type, r identical objects of yet another type...
- Compute number of arrangements when n objects divided into m groups
- Compute number of arrangements when distinguishable objects are arranged in a circle



Theoretical Components

STEP 1

You will require Chapter 12 of Maths Quest 11 Mathematical Methods (pdf - Google Classroom)

- ✓ Read through Section 12B on ${}^n P_r$ Permutations. Study examples 5 - 7
- ✓ Read through Section 12D on. Study and make notes on Examples 11 - 14.
- ✓ Read through Section 12E on Permutations with restrictions. Study examples 15 - 18.
- ✓ Read through Section 12F on Arrangement in a circle. Study examples 19 - 21.

Make your notes on the following key concepts:

- Permutations with restrictions, repetitions
- Arrangements in a circle

ABCD	ABDC	ACBD	ACDB	ADBC	ADCB
BACD	BADC	BCAD	BCDA	BDAC	BDCA
CABD	CADB	CBAD	CBDA	CDAB	CDBA
DABC	DACB	DBAC	DBCA	DCAB	DCBA

Permutations:

<http://www.tutors4you.com/circularpermutations.htm>

Practical Components

STEP 2

You will require Chapter 12 of Maths Quest 11 Mathematical Methods (pdf - Google Classroom)
Do the following questions. Organise your solutions neatly in your exercise book:

EX 12D: ALL even numbered questions.
EX 12E: ALL odd numbered questions.
EX 12F: ALL odd numbered questions.

Complete more of these questions if you need.

Investigation

STEP 3

1. Prove:

$${}^{n+1} P_r = {}^n P_r + r \cdot {}^n P_{r-1}$$

- In how many ways can four men and four women be seated alternatively:
 - in a row,
 - at a round table?
- How many arrangements of the letters in the word TOMATO are there, if the letters O are to be separated?

QFO

Quiz/Forum/Other

Continue with these questions:

See handout (online pdf) – Set Notation
Exercise 2A and 2B

Investigation

STEP 3

1. Prove:

$${}^{n+1}P_r = {}^nP_r + r \cdot {}^nP_{r-1}$$

2. Four men and four women are to be seated alternatively:
 - a. in a row,
 - b. at a round table.In how many ways can this be done?
3. How many arrangements of the letters in the word TOMATO are there, if the letters O are to be separated?

Extension Question:

In how many ways can four people be accommodated in a certain hotel if there are four rooms available?