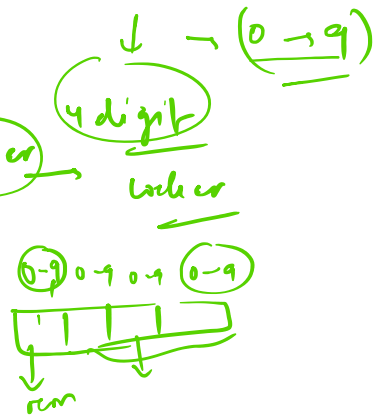


Permutation & Combination

arrange ment
 case case (→ Suitcase → Locker
 mathematical application
 arrange finding →

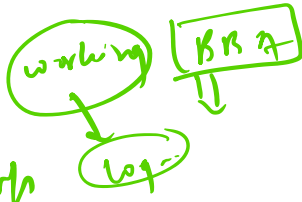


fundamental rule of counting principle

12th

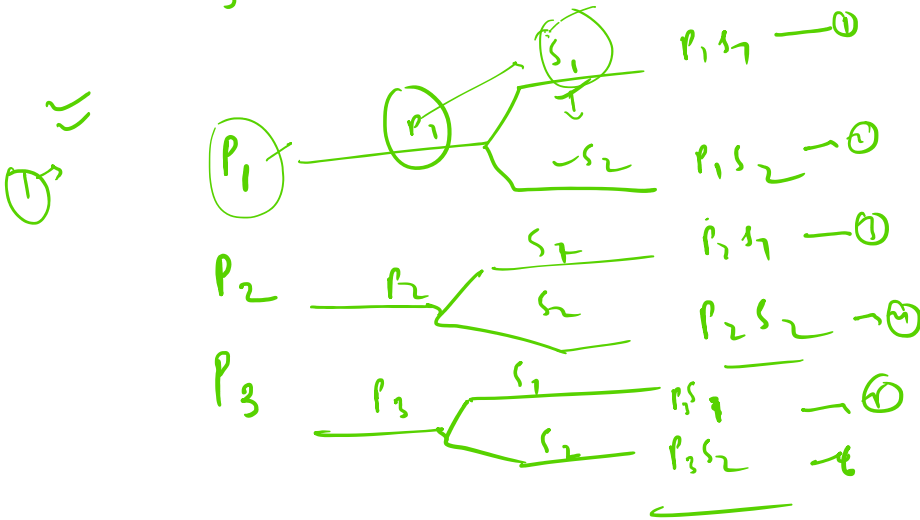
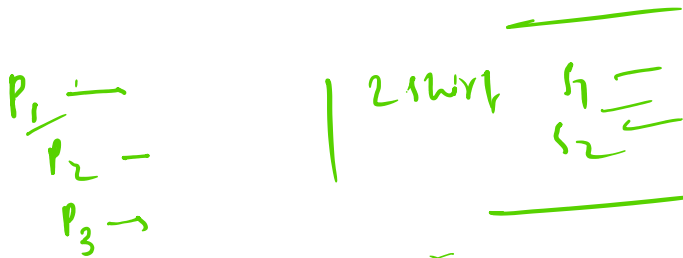
Solving

Ex Mohan has 3 points and 2 shirts



How many diff pair of a point and a shirt

Can done up with 9

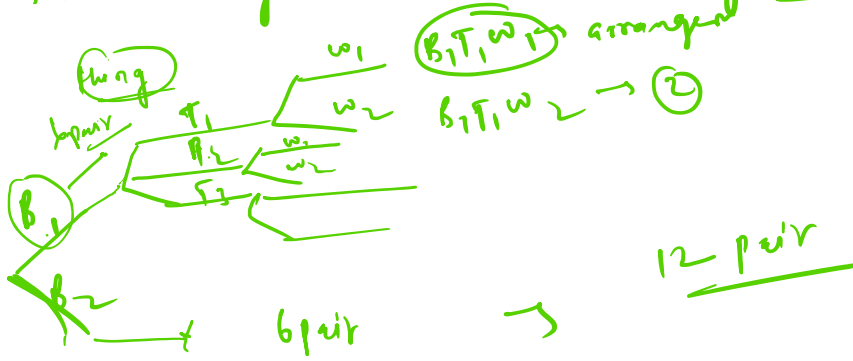


→ combination

↓ permutation

↓ permutation
 ✓ Sabnam has 2 school bag, 3 tiffin and 2 water bottles

in how many ways she can carry these items (choosing one each)

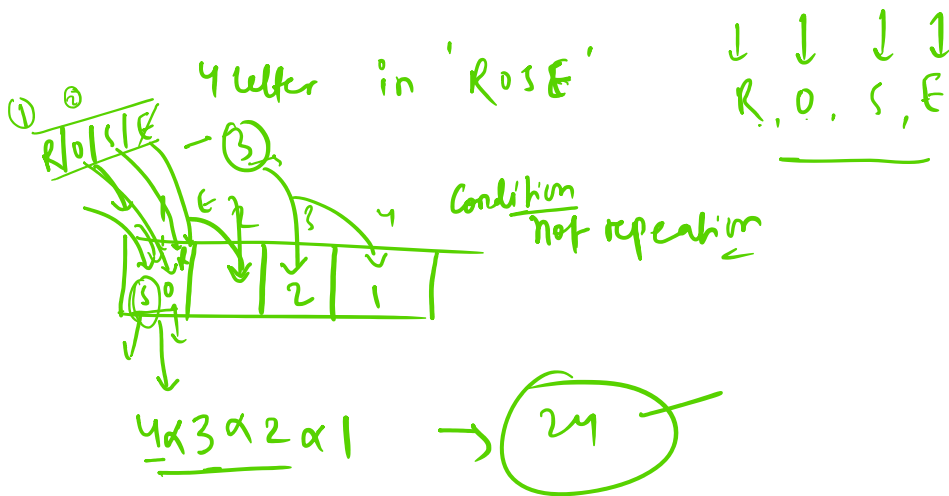


- ✓ 1) event of choosing (point) find n →
- ✓ 2) " choosing event & diff

↓ featuring permutation

Example 1 Find the number of 4 letter words, with or without meaning, which can be formed out of the letters of the word ROSE, where the repetition of the letters is not allowed.

permut ↓ ↓
 $24 \rightarrow (4 \times 3 \times 2 \times 1)$



→ If an event can occur in (n) different way - following which another event can occur in (m) ways -

then total number occurrence of the event
(m or n) ways

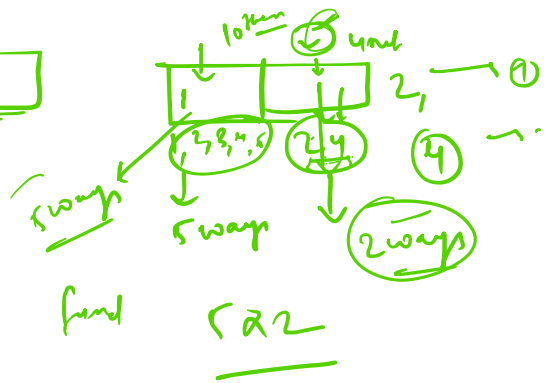
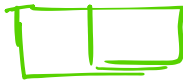
Example 3 How many 2 digit even numbers can be formed from the digits 1, 2, 3, 4, 5 if the digits can be repeated?

0, 2, 4, 6, 8

10

2 or 2
 even

0, 2, 4, 6, 8



unit 2

2 | 2

1 | 2

4 | 2

3 | 2

5 | 2

unit 4

2 4
 3 4
 4 4
 5 4

10

1 arrange

n(n-1)

Statement

concept

permutation

n!

fundamental

principle of counting

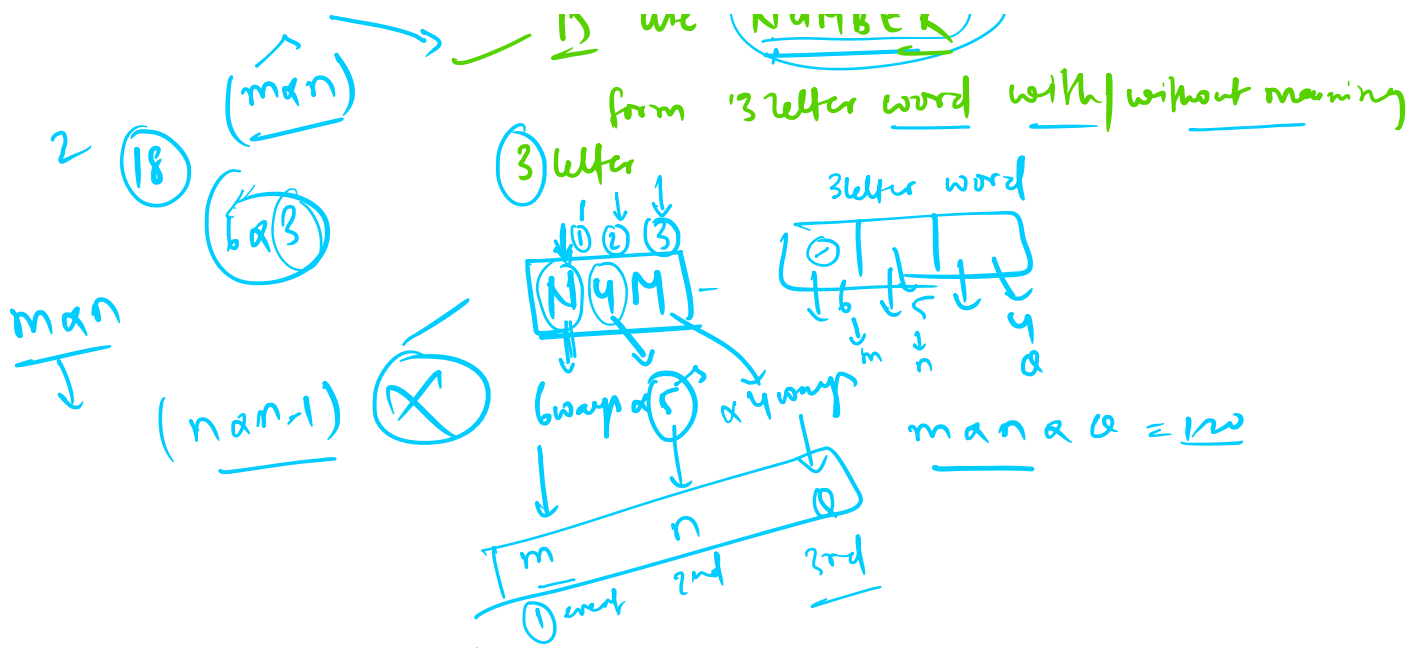
(m or n)

we

NUMBER

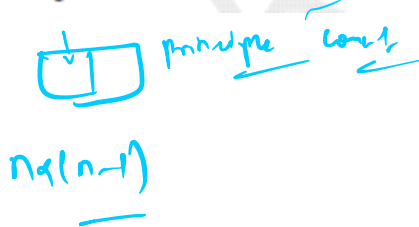
repetition of each allowed

can't be a word with/without meaning



$$mana a \Rightarrow b a s a y \Rightarrow \underline{120}$$

Example 3 How many 2 digit even numbers can be formed from the digits 1, 2, 3, 4, 5 if the digits can be repeated?

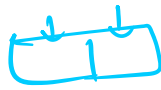


9F ~~man~~ letter is repetition (allowed)

$$\underline{6 \times 6 \times 6} \Rightarrow \underline{216}$$

Permutation is an arrangement in definite order of a num of objects taken some or all at a time

1) P → when all objch are distinct



Theory → the number of permutation of (n) diff object

① taken r at a time
 taken r at a time
 $r = 1, 2, 3$
 n

② object do not repeat

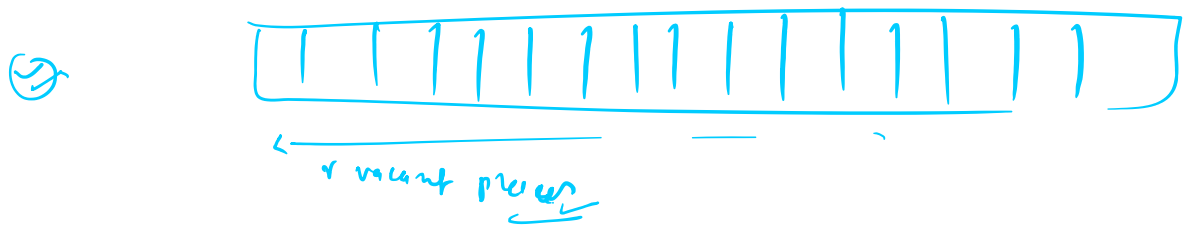
$$= \underline{n(n-1)(n-2) \dots (n-r+1)}$$

① 1 at a time ② repetition

$$0 < r \leq n$$



$$\Rightarrow \underline{n P_r = n(n-1)(n-2) \dots (n-r+1)}$$



n object

factorial \Rightarrow $n!$, product of the first n natural number

$$\rightarrow 1 \times 2 \times 3 \times 4 \times 5 \times \dots \times (n-1) \times (n) \quad \text{--- ①}$$

$$5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$$

Derived of ${}^n P_r \Rightarrow$

$${}^n P_r = \frac{n!}{(n-r)!} \quad 0 \leq r \leq n$$

${}^n C_r$

Allahabad \rightarrow permutation

(n)

ALLAHABAD \rightarrow 9! \rightarrow (9!)

Ex. 3.

How many 4 digit numbers can be formed out of the digits 1, 2, 3, 6, 9, 3?

Solution:

Here the first digit can be selected in 6 ways. The second in 5 ways etc.

The required number is ${}^6 P_4 = 6 \times 5 \times 4 \times 3 = 360$.

Ex. 4:

There are 6 books on statistics, 4 on Mathematics and 2 on Accountancy. In how many ways can these be placed on a shelf, if the books on the same subject are to be together?

Basic formula $\frac{n!}{r_1! r_2! \dots r_k!}$

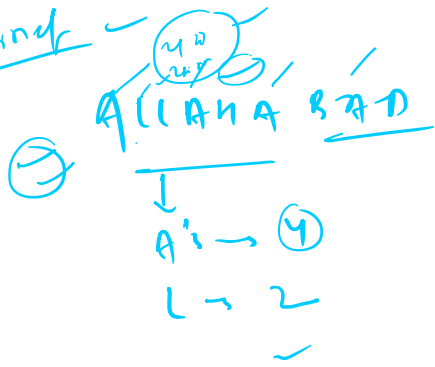
Example 3 How many 2 digit even numbers can be formed from the digits 1, 2, 3, 4, 5 if the digits can be repeated?

5P2

20
 \downarrow
 5P2
 (5!)
 $(n-r)! \rightarrow 3!$

5423
3!

dijawab



3024

