

## ☐ Examples : Product Rules

☐ How many different license plates are available if each plate contains a sequence of three letters followed by three digits?

Total letters : 26

↓  
from a to z

Total digits: 10

↓  
from 0 to 9

∵ 1<sup>st</sup> letter can be chosen in 26 ways.

∵ After the 1<sup>st</sup> letter is chosen, there are 26 ways to choose the 2<sup>nd</sup> letter

∵ After the first two letters are chosen, the third letter can be chosen in again 26 ways.

So, the three digits can be chosen  $10 \times 10 \times 10$

↓                      ↓                      ↓  
1<sup>st</sup> digit            2<sup>nd</sup> digit            3<sup>rd</sup> digit

Finally, total number of possible license plates:

$$26 \times 26 \times 26 \times 10 \times 10 \times 10$$

Ans.

☐ There are 32 microcomputers in a computer center. Each microcomputer has 24 ports. How many different ports to a microcomputer in the center are there?

Answer: Here, two different tanks

First, picking a  
micro computer

32

Then, picking a port  
on  
this microcomputer.

24

768

Given 100 different people, how many ways are there to select 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> prize winner?

$$\begin{array}{l|l}
 n = 100 & \text{So,} \\
 r = 3 & {}^n P_r = \frac{100!}{(100-3)!} = \frac{100!}{97!} \\
 & = 100 \times 99 \times 98 = 970,200
 \end{array}$$

How many permutations of the letters

ABCDEFGH contain the string ABC?

1 2 3 4 5 6

As ABC must be in each string, let's consider that ABC is a block and it is equivalent to a single letter. So, there are 6 objects now.

6 objects can be organized in — 6! ways.

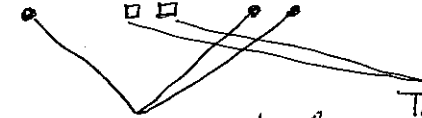
~~Additional~~ Not needed Ans

~~the~~ ~~block~~ ~~can~~ ~~be~~ ~~rearranged~~ ~~in~~ ~~any~~ ~~order~~

~~the~~ ~~block~~ ~~is~~ ~~considered~~ ~~as~~ ~~a~~ ~~single~~ ~~letter~~

Given a word SUCCESS, how many different strings can be formed by reordering the letters.

SUCCESS



to be treated as one

To be treated as same/one.

So, Total strings that are different  $\equiv \frac{7!}{3! 2!} = 420$