Q1 → In how many ways can you arrange 3 people around a round table?

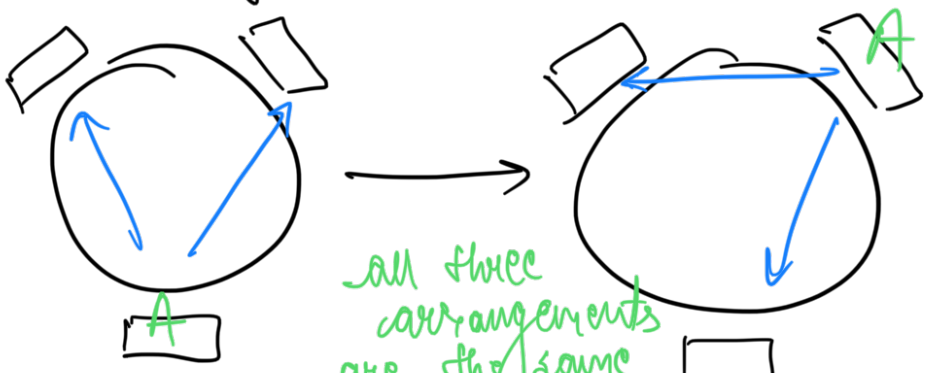
If row →

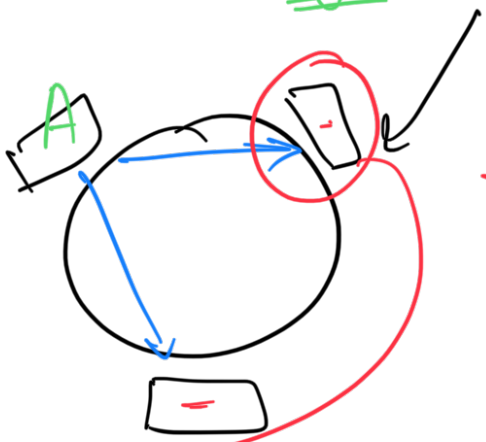
$3 \times 2 \times 1$

→ 3 people 3 slots → ${}^3P_3 = 3!$

now circle

let's say → A, B, C





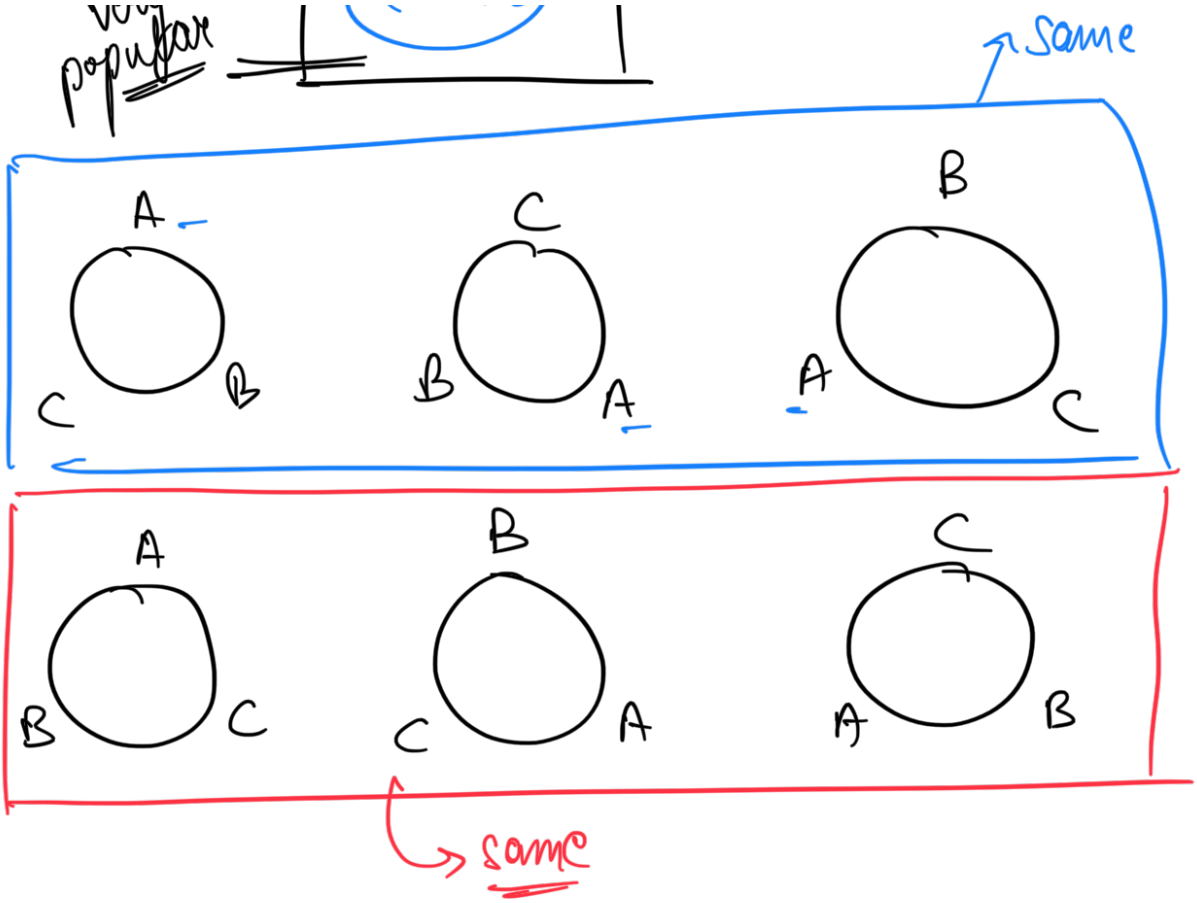
→ There is only 1 way to do that

$1 \quad 2 \quad 1 \rightarrow 1 * 2 * 1$

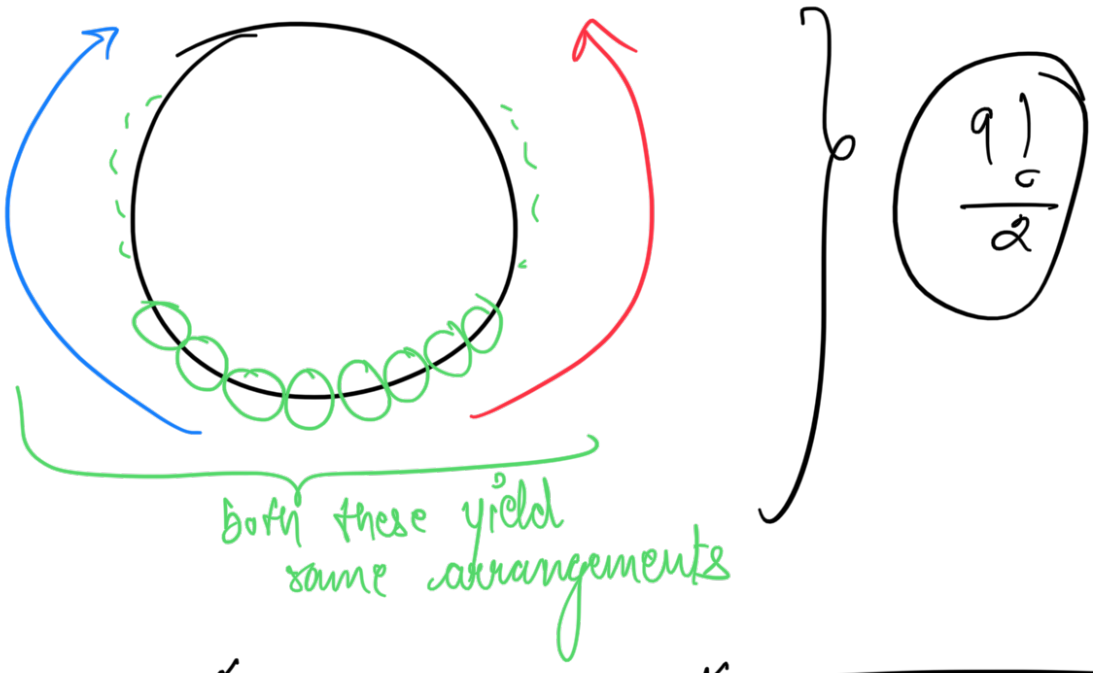
$2!$

$(n-1)!$

popular



Q3. → ways to arrange 10 identical beads in a necklace.



Q → Count the no. of ways to arrange 3 boys & 4 girls sit together.

such that no boys sit together

In a linear bench

_ G_1 _ G_2 _ G_3 _ G_4 _

If I arrange girls

$\rightarrow 4! = {}^4P_4 \rightarrow 24$

and

now for boys

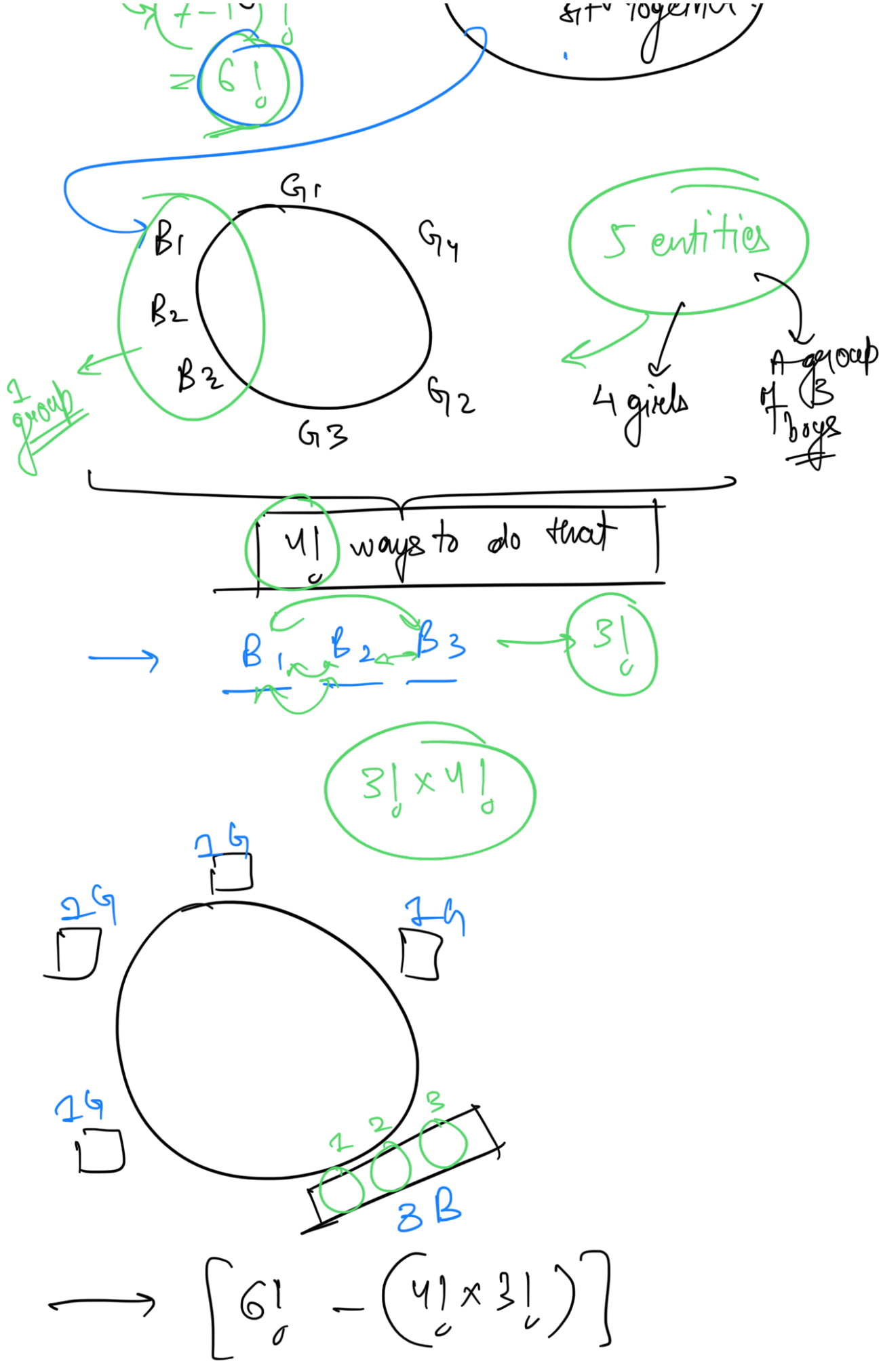
$\rightarrow {}^5P_3 \rightarrow \frac{5!}{2!} = 60$

$$\frac{4! \times 5!}{2}$$

G_1 B_1 G_2 B_2 G_3
B_1 G_1 G_2 G_3 B_2
B_1 G_1 B_2 G_2 G_3.
G_1 G_2 B_1 G_3 B_2

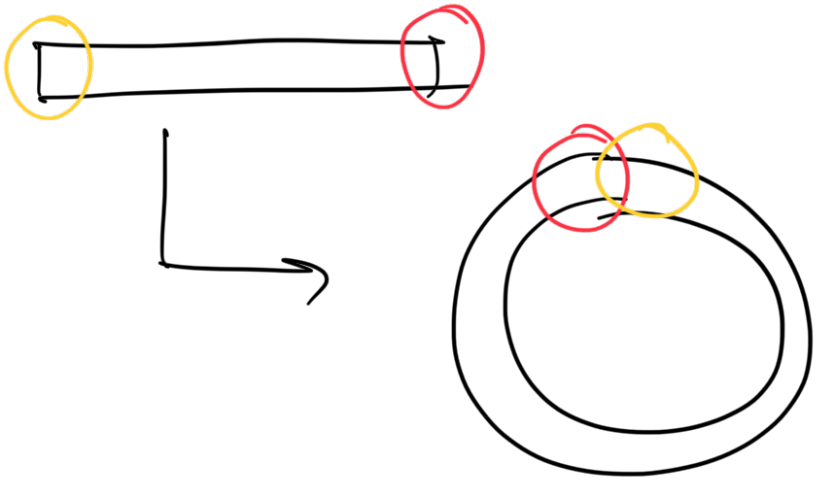
In a circular bench

total arrangements — ways in which boys can sit together


6!
G1
G4
G2
G3
B1
B2
B3
1 group
5 entities
4 girls
A group
B Boys
4! ways to do that
B1 B2 B3
3!
3! x 4!
1G
2G
1G
1G
1
2
3
3B
[6! - (4! x 3!)]

$\rightarrow \quad 720 - 24 \times 6$

$= \quad 576$



Q4 $\rightarrow$ In how many ways can we rearrange letters of the word Mumbai?

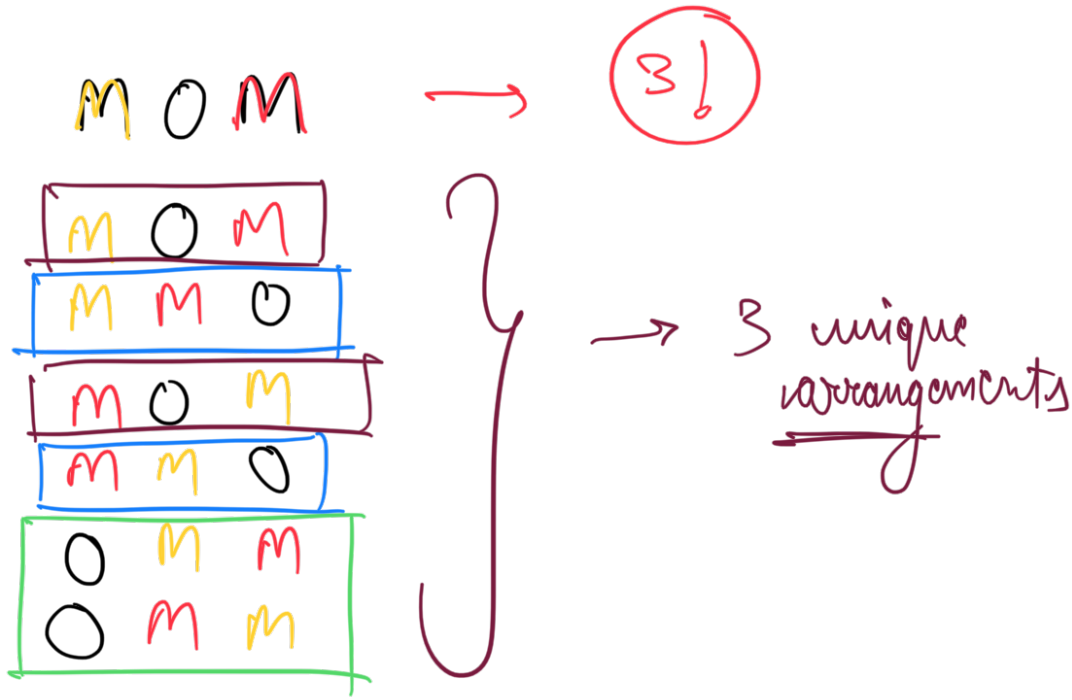
6 letters, 6 slots $\rightarrow {}^{6}P_{6} \rightarrow 6! = 720$

M U M B A I

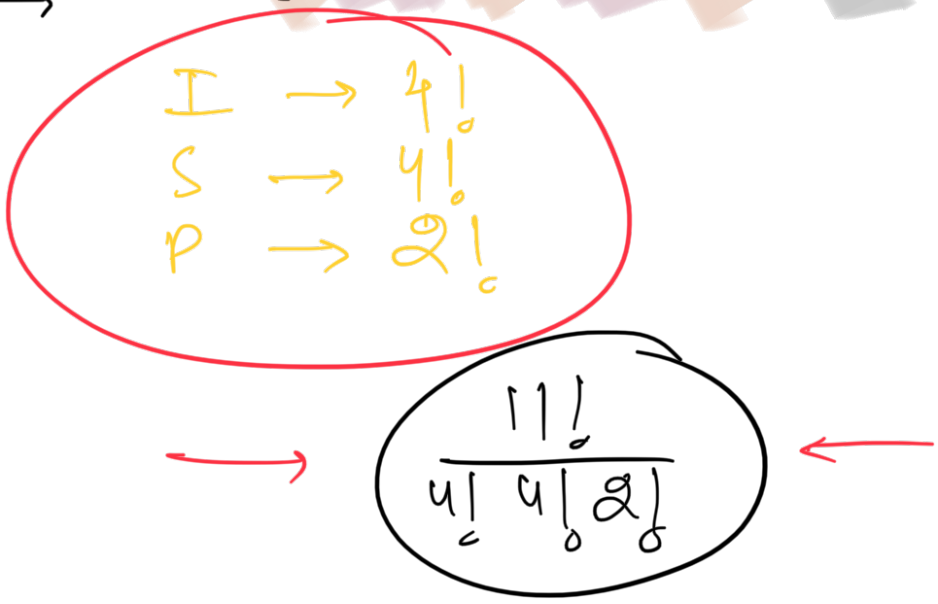
M U B M A I

M U B M A I

$\rightarrow \frac{6!}{2!} = 360$



Q5 → MISSISSIPPI



If in a string of n characters

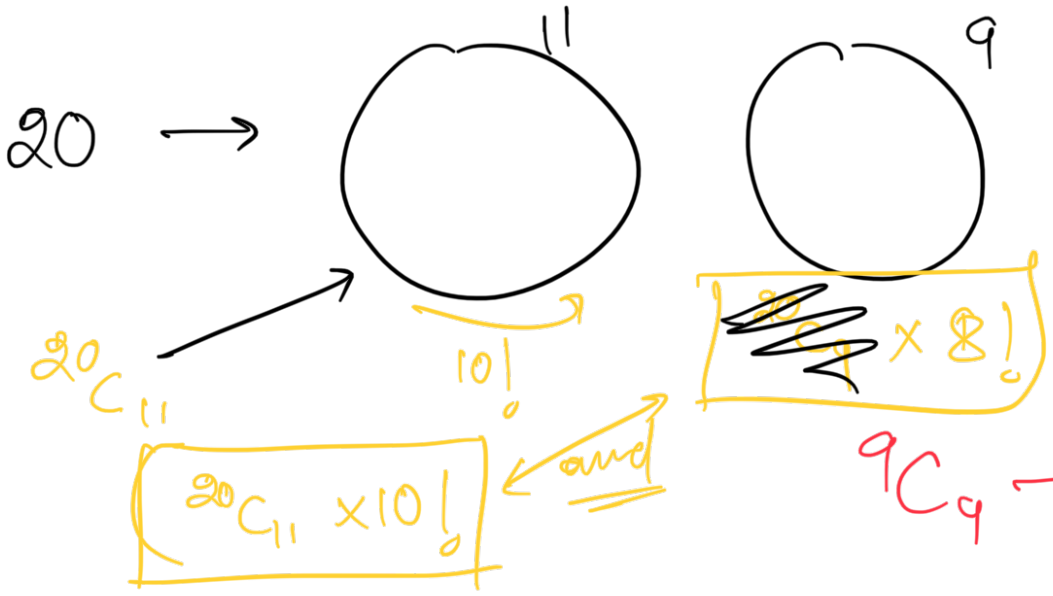
$a_1 \rightarrow m_1$ times

$a_2 \rightarrow m_2$ times

⋮

$a_n \rightarrow m_n$ times

$$\frac{n!}{m_1! \; m_2! \; \ldots \; m_n!}$$



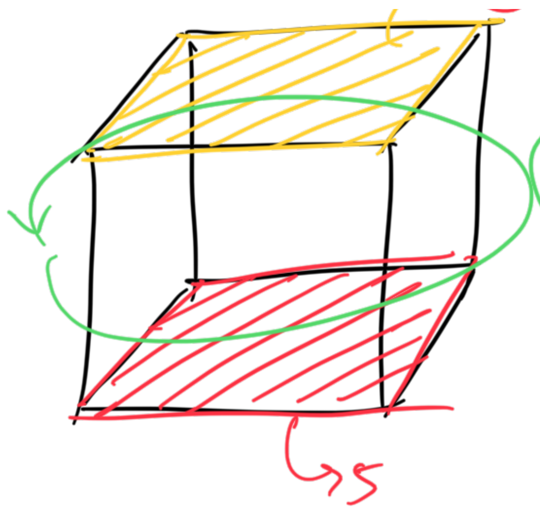
$$^{20}C_{11} = {}^{20}C_9$$

$$^nC_r = {}^nC_{n-r}$$

$$^{20}C_{11}\left(10! \times 8!\right)$$

$$^{11}P_4$$

6 ← only one



actually

3!

~~6~~ × 5 × 3!

= ~~30~~ 5 × 6

= ~~180~~

30 ✓

30 → $^{30}C_1$ → 30

30 → $^{30}C_1$ → 30 × 29

↳ 29 left → $^{29}C_1$ → 29

30 × 29

30 × 29

$30^4 \times 29^3$

str = msnhyghihi

m = index(curr_str)

func(str[m:])