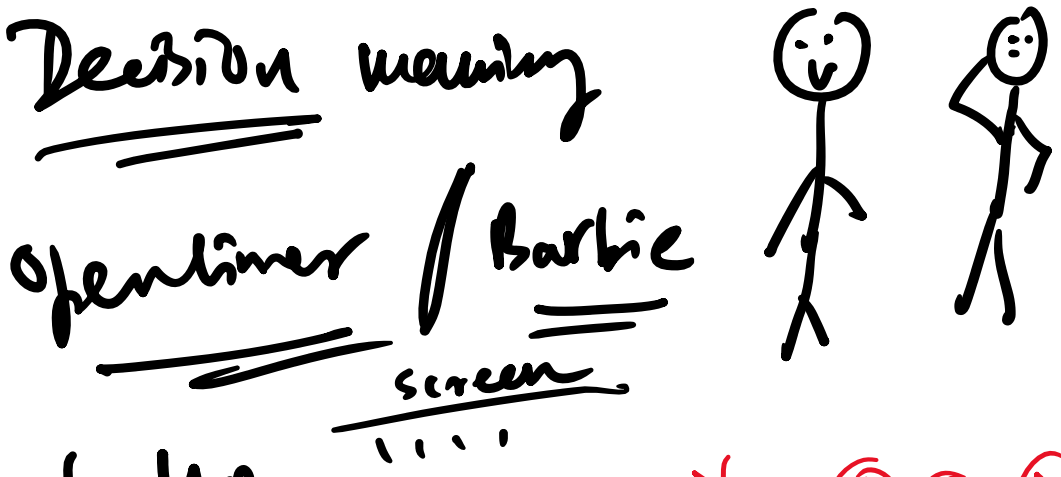
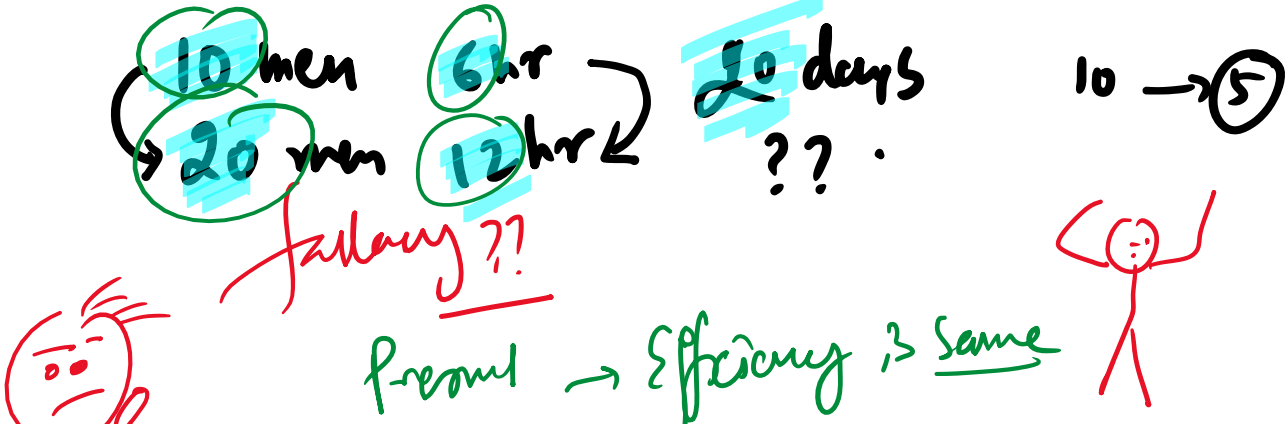
Permutation & Combination





Permut → Efficiency is same Λ

Permute   Combinate $^6C_3$

Jaga badal → Meaning Badal (P)

Jaga badal → no change → (C)

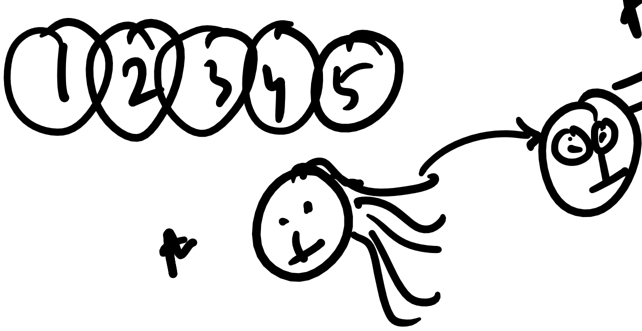
Zeeshan Tendu Story/football/Volly

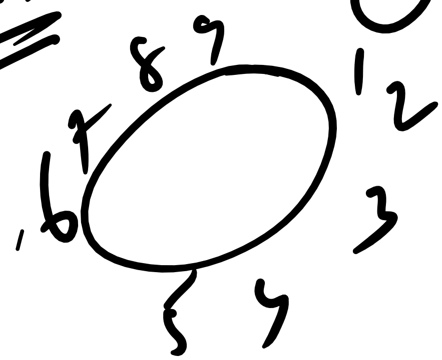
1 2 3
3 2 1
2 5 1 } (P)

16 → 11 → 4 (C)

24 → Pool
24C5 (C) Selection

FCFS





$$\frac{43653!}{43654!} = \frac{1}{43654}$$

21 ...

$\frac{2!}{3!} = \frac{1 \times 2}{1 \times 2 \times 3}$

(5) — (5) 5!

5 → 4

$\infty + \infty \to 2\infty \times \infty$

$\infty - \infty \to 0 \times \infty \times$ undefined

Number theory + P/C

2×3

$100! = 1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 10$ ___ ___ ___ × 96·97·98·99·100.

2's highest power?

$= 2^{1+2+3+1+\dots}$

7 5

How many zeros at the end?

GIF

[2.78] → 2

9/6 [6>9]

[2.99] → 2

[2.001] → 2

16×6

$\left[\frac{100}{2}\right] + \left[\frac{100}{2^2}\right] + \left[\frac{100}{2^3}\right] + \left[\frac{100}{2^4}\right] + \left[\frac{100}{2^5}\right] + \left[\frac{100}{2^6}\right] + \left[\frac{100}{2^7}\right]$

$= 50 + 25 + 12 + 6 + 3 + 1$

$= 97$

$100! = 1 \cdot 2 \cdots 100$

2^{97}

$100! \rightarrow 3$

$\frac{100}{3} + \frac{100}{9} + \frac{100}{27} + \frac{100}{81}$

$\frac{11}{3} \rightarrow 3$

$\rightarrow 33 + 11 + 3 + 1$

$\rightarrow 48$

23!

$= 1 \cdot 2 \cdots 5 \cdots 10 \cdots 12 \cdot 15 \cdots 20 \cdot 22 \cdots$

Last zero 2!

$= \cdot 0 0 0 0$

18! 20! 22! 26!

2 3 3 4 25 5x5

Zeros

1 . 2 . . . 4 . 5

12 . . . 15

20 22 25

5 is the gen of a zero...

5 15 20

(5) (15) (20)

22 → 1, 2 - - - - - - 22

$$\left[\frac{22}{5}\right] + \left[\frac{22}{5^2}\right] + \left[\frac{22}{5^3}\right]$$

⇒ 4

100! → $\left(\frac{100}{5}\right) + \left(\frac{100}{5^2}\right)$

20 + 4 → (24) zeros

@ the end...

n things taken r at a time...

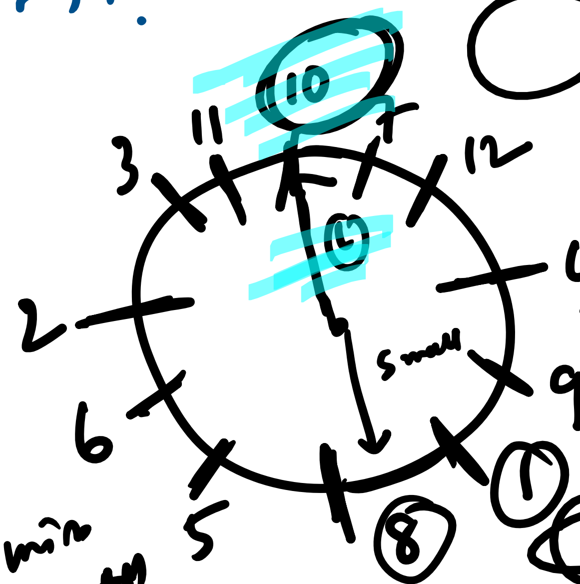
$^5P_3 \neq {^5C_3}$

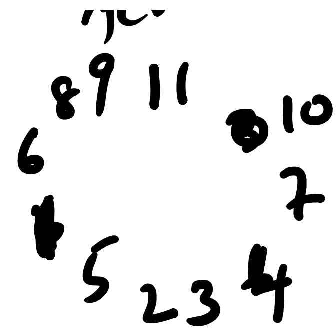
$^nP_3 > {^nC_3}$

$\frac{n!}{(n-3)!}$ $\frac{n!}{3!(n-3)!}$

CW
ACW
8 9 11 ...

$\frac{n!}{(n-3)!}$ $\frac{n!}{3!(n-3)!}$



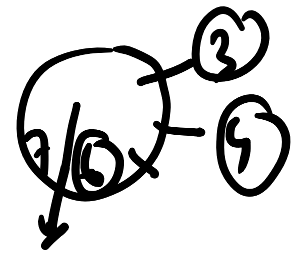


$\frac{60}{12} \to 5$

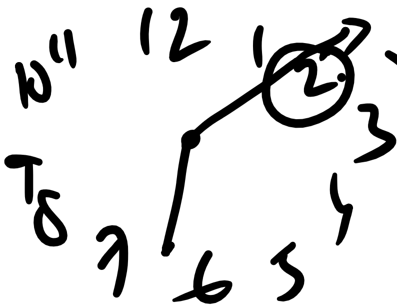
$5 \times 10 \to 50$

1PM 50min ⇒ 1:50 PM

5 PM



×5 → 10min



Jhoddh! NCERT → Jee main / Advanced

1st #

Lazy

$\frac{56 \, P_{r+6}}{54 \, P_{r+3}} = \frac{30800}{1}$

$\frac{56 \cdot 55 \cdot 54 \, P_{r+4}}{54 \, P_{r+3}} = \frac{30800}{1}$

$(r+4)+1 = 10$

$^{r}P_2 = ?$

$54 = (r+4)+! = 10$

$r = 41$

$^{41}P_2 \rightarrow \frac{41!}{39!} = 1640 \rightarrow 41 \times 40$

$(r+4) - (r+3) = 1$

$\frac{55 \times 56}{3080}$

6:30..

No formula List

10 → 9! 3! 2! → 5

BALL, B LL A, LL B A

INSURANCE

Vowels are together

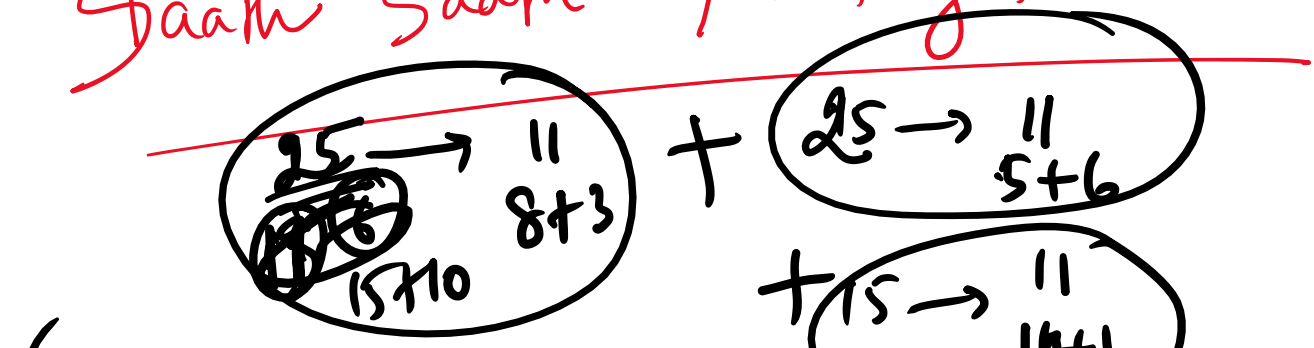
4! ← IUAE, N S R N C

$\frac{6!}{2!} \times 4! \rightarrow \frac{6.5.4.3.2.1}{2!} .24$

\+ ×

Saath Saath ya Alag time

Yaah Saam



$$\left({}^{15}C_8 \times {}^{10}C_3\right) + \left({}^{15}C_5 \times {}^{10}C_6\right) + \left({}^{15}C_{10} \times {}^{10}C_1\right)$$

$${}^{40}C_{22} \times {}^{25}C_5$$