Nishant Jindal

Q There are m men & 2 women participating in a chess game. Each participant has to play 2 games with every other participant. If the No. of games played by men bet^n themselves exceeds the No. of games played bet^n men & women by 84, then m = ?

2 men चाहिए

Man to man = Man to woman + 84

$$m_{C_2} \times 2 = m_{C_1} \times {}^2C_1 \times 2 + 84$$

$$\frac{(m)(m-1)}{2 \cdot 1} \times 2 = 2m + 42$$

$$m^2 - m = 4m + 84$$

$$m^2 - 5m - 84 = 0 \Rightarrow (m+7)(m-12) = 0 \Rightarrow m = 12, -7$$

Q A man has 7 Relatives in which 4 Ladies & 3 Gents. His wife also has 7 Rel. in which 3 Ladies & 4 Gents. In how many ways they can call 3 gents & 3 ladies for dinner when 3 Relatives are of men & 3 from his wife's side.?

Man: 7 Relatives		Woman: 7 Rel.	
4 L	3 G	3 L	4 G
3	0	0	3
2	1	1	2
1	2	2	1
0	3	3	0

$${}^4C_3 \times {}^3C_0 \times {}^3C_0 \times {}^4C_3 + {}^4C_2 \times {}^3C_1 \times {}^3C_1 \times {}^4C_2 + {}^4C_1 \times {}^3C_2 \times {}^3C_2 \times {}^4C_1 + {}^4C_0 \times {}^3C_3 \times {}^3C_3 \times {}^4C_0$$

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Dadaji Problem.

(1) A Grandfather with 7 Grand children to take them for park without using same 3 children together

(1) How frequently each child goes.

(2) How frequently dadaji will go.

R/S/G
R/S/M
R/M/M
R/M/S
R/M/G.

1) 7 players → 3 team

1 Bachha Jitni bar jayega Utni Bar sb Jayenge.

$1 \times {}^{6}C_2 = {}^{6}C_2$

Ram

(2) Jitni Bar 7 में से 3 Bchho ki team बनेगी Utni Bar dadaji Park Jayenge = ${}^{7}C_3$ times team में → ${}^{7}C_3$ times dadaji Jayenge

Fonda

(1) No of ways to make team of r persons out of n person = ${}^{n}C_r$

(2) No of ways to make a team of r persons out of n persons when p person will not come. ${}^{n-p}C_r$

(3) No of ways to make a team of r persons out of n persons when p persons are surely in team. ${}^{n-p}C_{r-p}$

Nishant Jindal

Maximising ^nC_r

$^6C_0 < {}^6C_1 < {}^6C_2 < {}^6C_3 > {}^6C_4 > {}^6C_5 > {}^6C_6$

1 6 15 20 15 6 1

n = Even
1 Middleterm

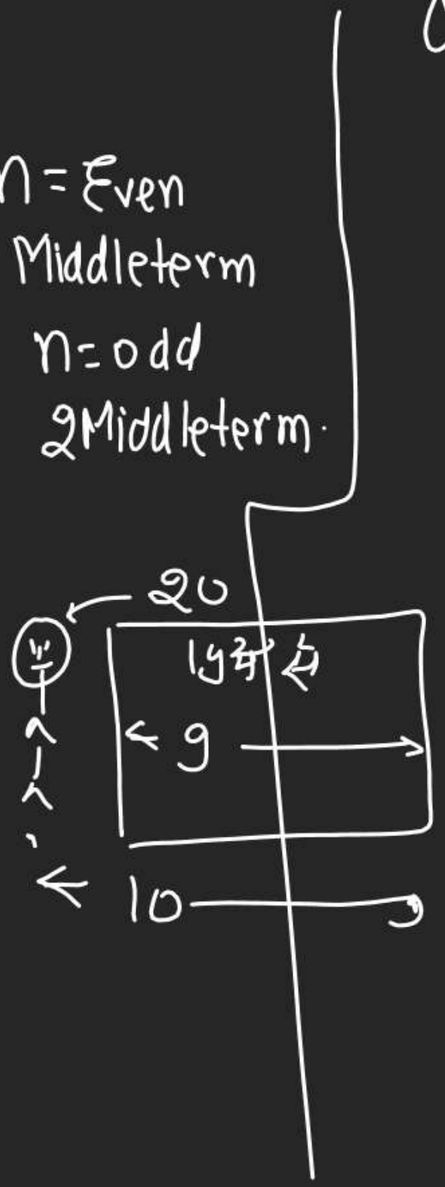
$^7C_0 < {}^7C_1 < {}^7C_2 < {}^7C_3 = {}^7C_4 > {}^7C_5 > {}^7C_6 > {}^7C_7$

1 7 21 35 = 35 21 7 1

n = odd
2 Middleterm.

^nC_r = Max^m (Middleterm)

- n = Even → $^nC_{\frac{n}{2}}$
- n = odd → $^nC_{\frac{n+1}{2}}$, $^nC_{\frac{n-1}{2}}$



Q A Person wishes to make as many as different Parties as he can out of 20 friends. Each Party consist of same No. of friends. ① How Many friends he Should invite at a time ② In how many of these would same men be found?

① $^{20}C_{r\,\text{Max}}$ $r = \frac{20}{2} \Rightarrow$ Max^m Parties

Psbl $= {}^{20}C_{10}$

② any of his friend can attend No of Parties $= 1 \times$ Rest of 9 People can be chosen out of 19

$= 1 \times {}^{19}C_9$

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Geometrical Problems.

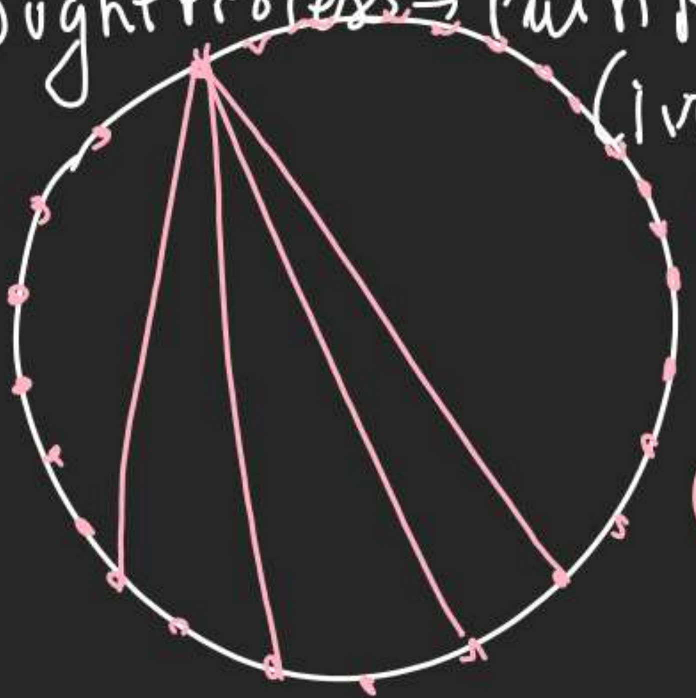
① n pts are given & none of them is collinear

A) find No of Lines made by them.

(B) find No. of Δ made by them

No 3 pts are in a Line.

Thought Process → Put n pts in a Circle



1) We need 2 pts to make a Line

So No of Pts = $^nC_2$

(2) We need 3 pts to make a Δ

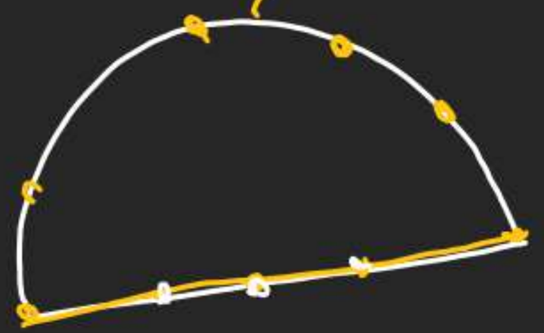
= $^nC_3$

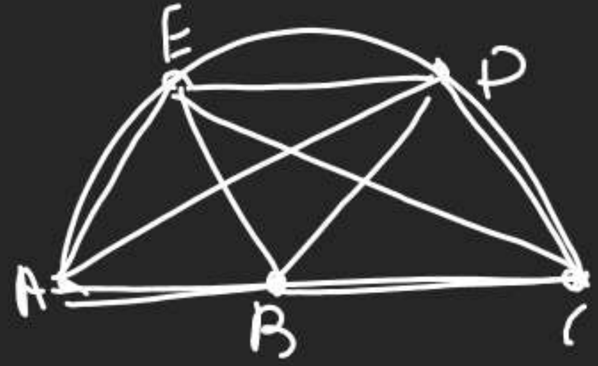
Q If 9 pts are given out of which 5 pts are in a Line find ① No of Lines (2) No of Δ

(B) $^9C_3 - {}^5C_3$

A) total Lines Psbl = $^9C_2 - {}^5C_2 + 1$

5 Pts Jo Ek Line Bna gaye





$^5C_2 - {}^3C_2 + 1$

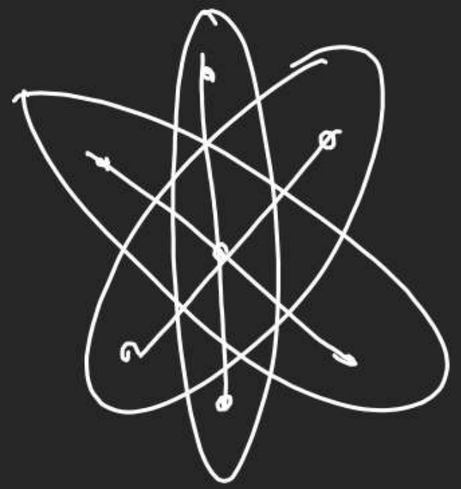
$10 - 3 + 1 = 8$

~~AB~~, ~~BC~~, BD, BE, AD

AE, CE, CD, AC, ED

Nishant Jindal

Q



① find No of Lines $= {}^{7}C_2 - {}^{3}C_2 + 1 - {}^{3}C_2 + 1 - {}^{3}C_2 + 1$

② find No of $\triangle = {}^{7}C_3 - {}^{3}C_3 - {}^{3}C_3 - {}^{3}C_3$