

Q: If $n_P = 6,720$ and $n_C = 56$
find n and r .

$$\frac{n!}{r!} = \frac{n_P}{r!}$$

$$56 = \frac{6720}{r!}$$

$$r! = \frac{6720}{56} = 120$$

$$r! = 120$$

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

$$r! = 5!$$

$$r = 5$$

$$P_2 = 6,720$$

$$P_5 = 6,720$$

$$\frac{n!}{(n-5)!} = 6,720$$

$$\frac{n(n-1)(n-2)(n-3)(n-4)(\cancel{n-5})}{(\cancel{n-5})} = 6,720$$

$$n(n-1)(n-2)(n-3)(n-4) = 8 \times 7 \times 6 \times 5 \times 4$$

$$n = 8$$

Case iv ${}^nC_4 = 5 \times {}^nP_3$ Find n .

Solution:

$$\frac{n!}{(n-4)!4!} = 5 \times \frac{n!}{(n-3)!}$$

$$\frac{(n-3)!}{(n-4)!4!} = 5$$

$$\frac{(n-3)(n-4)!}{(n-4)!} = 5 \times 4!$$

$$n-3 = 5 \times 4 \times 3 \times 2 \times 1$$

$$n-3 = 120$$

06

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$$2n C_3 : n C_2 = 44 : 3$$

$$\frac{2n!}{(2n-3)! 3!} : \frac{n!}{(n-2)! 2!} = \frac{44}{3}$$

$$\frac{2n(2n-1)(2n-2)(2n-3)!}{(2n-3)! 3!} : \frac{n(n-1)(n-2)!}{(n-2)! 2!} = \frac{44}{3}$$

$$\frac{2n(2n-1)(2n-2)(2n-3)!}{(2n-3)! 3 \times 2!} \times \frac{(n-2)! 2!}{n!} = \frac{44}{3}$$

$$\frac{2n(2n-1)2(n-1)}{n(n-1)(n-2)!} \times \frac{(n-2)!}{1} = 44$$

$$4 \times 2n-1 = 44$$

$$2n-1 = 44$$

$$4$$

$$2n-1 = 11$$

$$2n = 11 + 1$$

$$2n = 12$$

$$n = \frac{12}{2} = 6$$

15 खेलाड़ियों में 3 अध्यापक हैं। कितने ढंग से 11 खेलाड़ी चुने जा सकते हैं यदि कम से कम एक अध्यापक अवश्य खेलें?

$$\text{Total No of Players} = 12$$

$$\text{No of teachers} = 3$$

11 Players out of 15 खेलाड़ियों

एक भी अध्यापक न चुनने के तरीके = 12

कम से कम एक अध्यापक चुनने के तरीके

$${}^{15}C_{11} - {}^{12}C_{11}$$

$$= \frac{15!}{(15-11)!11!} - \frac{12!}{(12-11)!11!}$$

$$= \frac{15!}{4!11!} - \frac{12!}{1!11!}$$

$$= \frac{15!}{4!11!} - \frac{12!}{1!11!}$$

$$= 1365 - 12 = 1353$$

4 गोलों और 3 रंगों में से 2 गोलों का एक सेट
लेना है। प्रत्येक रंग के 2 गोलों का एक सेट
लेना है। (Find the total number of
selection of at least one red ball from 4
red and 3 green balls, if the balls of the
same colour are different.)

Solution: Total No of red ball = 4

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No of ways to choose one or more red balls out of 4

$$= {}^4C_1 + {}^4C_2 + {}^4C_3 + {}^4C_4$$

$$= 2^4 - 1 = 15$$

Number of ways to choose zero or more green balls out of 3

$$= {}^3C_0 + {}^3C_1 + {}^3C_2 + {}^3C_3 = 2^3 = 8$$

Total no of required numbers $= 15 \times 8 = 120$

किसी प्रतियोगिता के लिए एक वर्ग के 25 विद्यार्थियों में से 5 विद्यार्थियों का चुनना है। कितने तरीके से इसे किया जा सकता है? (From a class of 25 students, 5 are to be chosen for competition. In how many ways can this be done?)

Total No of students = 25

No of 5 students out of 25 choose

∴ Required ways = ${}^{25}C_5$

$$= \frac{25!}{(25-5)!5!}$$

$$= \frac{25 \times 24 \times 23 \times 22 \times 21 \times 20!}{5!}$$

$$= \frac{20! \times 5 \times 4 \times 3 \times 2 \times 1}{5!}$$

$$= 5 \times 23 \times 22 \times 21$$

$$= 53,120$$

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