Very Important Formula of Combination

Formula : ${}^nC_x = {}^nCy$, then there are two possible conditions
(i) x = y, or
(ii) x + y = n

Question 1 : Find the value of n, if ${}^nC_4 = {}^nC_6$
Solution : If ${}^nC_x = {}^nCy$, then there are two possible conditions
(i) x = y, or
(ii) x + y = n
So, in this case second condition will apply
4 + 6 = n,
n= 10.

Question 2 : Find the value of n, if ${}^nC_9 = {}^nC_{12}$
Solution : If ${}^nC_x = {}^nCy$, then there are two possible conditions
(i) x = y, or
(ii) x + y = n
So, in this case second condition will apply
9 + 12 = n,
n= 21.

Question 3 : Find the value of n, if ${}^nC_{10} = {}^nC_{12}$, so find ${}^{22}C_n$
Solution : If ${}^nC_x = {}^nCy$, then there are two possible conditions
(i) x = y, or
(ii) x + y = n
So, in this case second condition will apply
10 + 12 = n,
n= 22.

Now, the value $^{22}C_n = {}^{22}C_{22} = 1$

Question 4 : Find the value of x, if $^{18}C_8 = {}^{18}C_x$

Solution : If $^nC_x = {}^nCy$, then there are two possible conditions

(i) x = y, or

(ii) x + y = n

So, in this case second condition will apply

8 + x = 18,

x= 10.

Question 5 : Find the value of x, if $^6C_x = {}^6C_4$

Solution : If $^nC_x = {}^nCy$, then there are two possible conditions

(i) x = y, or

(ii) x + y = n

So, in this case second condition will apply

x + 4 = 6,

x= 2.

Question 6 : Find r if $^{12}C_{2r} = {}^{12}C_{r+3}$

Solution : If $^nC_x = {}^nCy$, then there are two possible conditions

(i) x = y, or

(ii) x + y = n

So, in this case second condition will apply

2r + r + 3 = 12

3r = 12 - 3

3r = 9

r = 3 .

Explore Creativity
iCOMESTAR
Indian Competition Oriented Mathematical Exam