Brainbox learn easy

Chapter 07

PERMUTATIONS AND COMBINATIONS

EXAMPLE-2:

If ${}^{n}P_{7} = 42\,{}^{n}P_{5}$, find '$n$'.

SOLUTION:

Given ${}^{n}P_{7} = 42\,{}^{n}P_{5}$

$$\frac{{}^{n}P_{7}}{{}^{n}P_{5}} = 42$$

$$= \frac{n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)}{n(n-1)(n-2)(n-3)(n-4)} = 42$$

$$= (n-5)(n-6) = 42$$

$$= n^2 - 11n + 30 - 42 = 0$$

$$= n^2 - 11n - 12 = 0$$

$$= n^2 - 12n + n - 12 = 0$$

$$= n(n-12) - 1(n-12) = 0$$

$$= (n-1)(n-12) = 0$$

$$= n = 1 (\text{or}) 12$$

But $n \neq 1$,

since $\boxed{n \geq r}$

$\therefore n = 12$.