Mathematics

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(Chapter – 7) (Permutations and Combinations)

(Class – XI)

Exercise 7.2

Question 1:

Evaluate **(i)** 8! **(ii)** 4! – 3!

Answer 1:

(i) 8! = 1 × 2 × 3 × 4 × 5 × 6 × 7 × 8 = 40320

(ii)4! = 1 × 2 × 3 × 4 = 24

3! = 1 × 2 × 3 = 6

∴ 4! – 3! = 24 – 6 = 18

Question 2:

Is 3! + 4! = 7!?

Answer 2:

3! = 1 × 2 × 3 = 6

4! = 1 × 2 × 3 × 4 = 24

∴3! + 4! = 6 + 24 = 30 7! = 1 × 2 × 3 × 4 × 5 × 6 × 7 = 5040 ∴ 3! + 4! ≠ 7!

Question 3:

Compute $\frac{8!}{6!\times 2!}$

Answer 3:

$$\frac{8!}{6!\times 2!}=\frac{8\times 7\times 6!}{6!\times 2\times 1}=\frac{8\times 7}{2}=28$$

Question 4:

If $\frac{1}{6!}+\frac{1}{7!}=\frac{x}{8!}$, find x.

Answer 4:

$$\frac{1}{6!}+\frac{1}{7!}=\frac{x}{8!}$$

$$\Rightarrow \frac{1}{6!}+\frac{1}{7\times 6!}=\frac{x}{8\times 7\times 6!}$$

$$\Rightarrow \frac{1}{6!}\left(1+\frac{1}{7}\right)=\frac{x}{8\times 7\times 6!}$$

$$\Rightarrow 1+\frac{1}{7}=\frac{x}{8\times 7}$$

$$\Rightarrow \frac{8}{7}=\frac{x}{8\times 7}$$

$$\Rightarrow x=\frac{8\times 8\times 7}{7}$$

$$\therefore x=64$$

Question 5:

Evaluate $\frac{n!}{(n-r)!}$, when

(i) $n = 6, r = 2$ **(ii)** $n = 9, r = 5$

Answer 5:

(i) When n = 6, r = 2: $\frac{n!}{(n-r)!}=\frac{6!}{(6-2)!}=\frac{6!}{4!}=\frac{6\times 5\times 4!}{4!}=30$

(ii) When n = 9, r = 5: $\frac{n!}{(n-r)!}=\frac{9!}{(9-5)!}=\frac{9!}{4!}=\frac{9\times 8\times 7\times 6\times 5\times 4!}{4!}$

$$=9\times 8\times 7\times 6\times 5=15120$$