

Exercise 7.2 : Solutions of Questions on Page Number : 140

Q1 :

Evaluate

(i) $8!$ (ii) $4! - 3!$

Answer :

$$(i) 8! = 1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 = 40320$$

$$(ii) 4! = 1 \times 2 \times 3 \times 4 = 24$$

$$3! = 1 \times 2 \times 3 = 6$$

$$\therefore 4! - 3! = 24 - 6 = 18$$

Q2 :

Is $3! + 4! = 7!$?

Answer :

$$3! = 1 \times 2 \times 3 = 6$$

$$4! = 1 \times 2 \times 3 \times 4 = 24$$

$$\therefore 3! + 4! = 6 + 24 = 30$$

$$7! = 1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 = 5040$$

$$\therefore 3! + 4! \neq 7!$$

Q3 :

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

Answer :

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

Q4 :

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

Answer :

$$\begin{aligned}\frac{1}{6!} + \frac{1}{7!} &= \frac{x}{8!} \\ \Rightarrow \frac{1}{6!} + \frac{1}{7 \times 6!} &= \frac{x}{8 \times 7 \times 6!} \\ \Rightarrow \frac{1}{6!} \left(1 + \frac{1}{7} \right) &= \frac{x}{8 \times 7 \times 6!} \\ \Rightarrow 1 + \frac{1}{7} &= \frac{x}{8 \times 7} \\ \Rightarrow \frac{8}{7} &= \frac{x}{8 \times 7} \\ \Rightarrow x &= \frac{8 \times 8 \times 7}{7} \\ \therefore x &= 64\end{aligned}$$

Q5 :

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

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

Answer :

(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 $n = 9$, $r = 5$,
$$\frac{n!}{(n-r)!} = \frac{9!}{(9-5)!} = \frac{9!}{4!} = \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4!}{4!}$$
$$= 9 \times 8 \times 7 \times 6 \times 5 = 15120$$