

8.2 Permutations (cont.)

Note Title

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Solve $nP_3 = 60$

$$\frac{n!}{(n-3)!} = 60$$

$$\frac{n(n-1)(n-2)(\cancel{n-3}!)^{\cancel{1}}}{(\cancel{n-3}!)^{\cancel{1}}} = 60$$

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

$$\therefore \boxed{n=5}$$

$$nP_r = \frac{n!}{(n-r)!}$$

Solve

$$6P_r = 30$$

$$\frac{6!}{(6-r)!} = 30$$

$$\frac{6!}{30} = (6-r)!$$

$$24 = (6-r)!$$

$$4! = (6-r)!$$

$$\therefore 4 = 6-r$$

$$\Rightarrow \boxed{r=2}$$

$$6P_r = \boxed{6} \times \boxed{5} \times \boxed{4} \times \dots$$

$$\frac{6!}{(6-r)!} = 30$$

$$\boxed{6 \times 5} \uparrow$$

$$\boxed{r=2}$$

Solve: $7P_r = 840$

$$7 \times 120$$

$$7 \times 6 \times 20$$

$$\boxed{7 \times 6 \times 5 \times 4}$$

$$\boxed{r=4}$$

$$5P_r = 60 = \boxed{5 \times 4 \times 3}$$

$$\boxed{r=3}$$

Solve $nC_2 = 6$

$$\frac{n!}{2!(n-2)!} = 6 \times 2!$$

$$\frac{n!}{(n-2)!} = 12$$

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

$$nC_r = \frac{n!}{r!(n-r)!}$$

$$n(n-1) = 4 \times 3$$

$$n = 4$$