# PERMUTATION AND COMBINATION
## Work Sheet: 07-LCR-01-WS



**Introduction:**

You have studied about Permutation and Combination.

Fundamental Principle of Counting and Arrangement is called **Permutation**. The number of permutations of r objects selected out of n is denoted by $rnP$ and it is given by

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

**Combination** is a way of selecting some items from a collection, or counting the number of distinct groups formed. The number of ways of selecting r objects out of n is denoted by $rnC$ and it is given by

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

Number of permutations with replacement:

$$rnP \ with\ replacement = n^r$$

Number of combinations with replacement:

$$rnC\ with\ replacement = rr + n - 1C = \frac{(r+n-1)!}{r!(r+n-1-r)!} = \frac{(r+n-1)!}{r!(n-1)!}$$

1. I have 4 different shirts and 3 different trousers. How many choices of outfits do I have today?

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2. I have 3 varieties of green grapes and 2 varieties of purple grapes. How many types of juice can I make where each juice needs 1 green variety and 1 purple?

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3. There are 25 children in a class. In how many ways can Teacher select a class monitor?

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4. There are 25 children in a class. In how many ways can Teacher select a 2-member debating team?

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5. There are 25 children in a class. In how many ways can Teacher can select class president and vice-president?

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6. There are 4 teams. If each team must play every other team, how many matches will be played in all?

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7. How many different 1 or 2-digit numbers can be formed using the digits 5 and 3, without repeating any digits?

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8. How many different 3-digit numbers can be formed using the digits 2, 4 and 7 where repeating digits are allowed?

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9. There are 8 persons and 2 cars. Each car takes 4 persons. In how many ways can the 8 people travel?

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10. I must colour the hat, coat and boots of a cartoon by selecting any 3 different colours out of yellow, green, blue, red and brown. In how many ways can I colour the cartoon?

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11. How many 3-digit numbers are there?

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12. How many 3-digit even numbers are there?

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