## COMBINATIONS

$>$ A combination is a set of items taken from another set in which order does not matter.

- Arranging letters $A B C$ in a situation when order of the letters matters gives 3! arrangements. When order is important, we calculate a permutation: ${ }_{\mathrm{n}} \mathrm{Pr}$ $A B C, A C B, C A B, B A C, C B A, B C A$ are all considered different arrangements.
- Arranging letters $A B C$ in a situation when order of the letters is unimportant, gives fewer possibilities. That is $A B C, A C B, C A B, B A C, C B A, B C A$ are all considered the same combination.
$>$ The number of combinations of $r$ items selected from a set of $n$ items is given by:

Alternative notations: $\qquad$ or $\qquad$

Example1: In how many ways can a five-card hand be selected from a standard deck?

## Example 2:

In a competition, junior chefs make a gourmet soup by selecting from 10 different ingredients. How many different soups can the chefs make if the soup must include:
a) Four of the ingredients?
b) Five of the ingredients?
c) Six of the ingredients?

Example 3: How many triangles can be drawn using seven distinct points as vertices?

Example 4: A committee of 3 men and 3 women is formed from a group of 8 men and 10 women. How many ways are there to form a committee?

Notes:
Give at least two examples of each:

1. Permutations of symbols/numbers/letters/items encountered or used daily:
2. Combination of symbols/numbers/letters/items encountered or used daily:
