ICM Notes

**6.4 Permutations and Combinations**

**Permutation** – an arrangement of a set of objects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ex 1: A boy has 4 beads – red, blue, white, yellow. How many different ways can they be arranged in a row?

Ex 2 – All 20 ICM students are in a contest. How many ways can 1st, 2nd, and 3rd place be awarded?

n-Factorial n!

n! =

0! =

The # of permutations of *n* different objects taken *r* at a time is

**P(n, r) =**

Revisit Ex 2:

**Combination** – an arrangement of a set of objects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ex 3 – A Senate investigation subcommittee of four members is to be selected from a Senate committee of ten members. Determine the number of ways this can be done.

The number of combinations of *n* different objects taken *r* at a time is

**C(n, r) =**

Revisit Ex 3:

Ex 4: Find the number of 5-card poker hands that can be dealt from a standard deck of cards.

Ex 5: A string quartet consisting of 2 violinists, 1 violist, and 1 cellist is to be selected from a group of 6 violinists, 3 violists, and 2 cellists. How many ways can the quartet be formed?