ALGEBRA 2H
Section 12.3: Combinations
NOTES

I. **Combinations**

Definition: A **combination** is an arrangement of objects in which the order is _____ important.

Examples:

(a) How many different ways can the letters A, B, C be arranged if the <u>order matters</u>? List them.

(b) How many different ways can the letters A, B, C be arranged if the <u>order does not matter</u>? List them.

(c) How many different ways can the letters A, B, C be arranged if the <u>order does not matter</u> and we only use 2 out of the 3 letters? List them.

II. **Combinations of n Objects Taken r at a Time**

If you have n objects but you are only using r of them in your arrangement and the order of the objects does not matter (meaning that changing the order does not make a new arrangement), then it is a combination.

Formula: The combination of **n objects taken r at a time**, denoted _____,

is found by _____

Note: You can find these combinations with a calculator (the calculator knows the formula).

Examples:

(a) If you have 20 books and can place 7 of them on shelf, how many different arrangements can you make if the order of the books does not matter?

_____

(b)   If you have 15 CD's, how many ways can you listen to 3 of them if you don't care what order they are in?

                                    _____

(c)   You are playing a card game where you will be dealt 7 cards from a standard deck of cards. How many different "hands" are possible?

                                    _____

(d)   If you have 10 people in a club and you need 4 of them to be on a committee together, how many different committees are possible?

                                    _____

(e)   If you have 10 people in a club and you need to select 4 officers (president, vice-president, secretary, and treasurer), how many different ways are possible?

                                    _____

(f)   A book store has 10 novels and 6 nonfiction books to choose from. How man ways are there to select 3 novels and 2 nonfiction books?

                                    _____

III.   Using Combinations in Probability

Example: You are playing a card game where you will be dealt 4 cards from a standard deck of cards.

(a)   How many different "hands" are possible?   _____

(b)   What is the probability that you have all 4 aces?

                                    _____

(c)   What is the probability that you have 2 aces and 2 kings?

                                    _____

(d)   What is the probability that you have 3 queens?

                                    _____