Objectives:

~ Calculate Combinations
~ Distinguish between Perm. and Comb.

Combinations

When a group of objects is arranged and order does NOT matter, it is called a Combination.

** Order does NOT matter! **

Combinations: $C(n,r) = \frac{n!}{(n-r)!r!} = {}_nC_r$

The n is the total number and the r is how many we need to order.

Example 1: Combinations

Use the definition of Combinations to simplify.

a.) $C(5,3)$

b.) $C(9, 6)$

Example 1: Combinations

Calculator: MATH → PRB ↓ 3: nCr

a.) C(5,3)

b.) C(9, 6)

Example 2: Combinations

An Alg 2 class has 27 students. We want to make a committee of 3 students to plan a party. How many different ways can we do this?

Example 3: Combinations

Subzero has 9 different flavors to put in your ice cream. You can choose 3 flavors to put in it. How many different flavor combinations can you create?

Example 4: Combinations

A basket contains 4 acorn squash, 5 gourds, and 8 pumpkins. How many ways can 2 acorn squash, 1 gourd, and 2 pumpkins be chosen? (Hint: We need 3 different combinations and then multiply them together...)

Example 5: Combinations

A bag contains 8 green marbles, 6 blue marbles, and 9 red marbles. How many ways can 6 marbles be selected to meet the following condition: All Marbles are red.

Example 6: Combinations

A bag contains 8 green marbles, 6 blue marbles, and 9 red marbles. How many ways can 6 marbles be selected to meet the following condition: 2 are blue and 4 are red.

Permutations

or

Combinations

Example 7:

Arrangement of 10 books on a shelf.

Example 8:

Selection of a committee of 3 from 10 people.

Example 9:

A hand of 6 cards from a deck of 52 cards.

Example 10:

Number of ways to make a license plate with 6 numbers without repeating numbers.

Example 11: Combinations

Use the definition of Combinations to simplify.

a.) C(10, 3)

b.) C(10, 7)

Do you notice any pattern...?

Example 12: Combinations

Solve for n.

a.) $C(n,8)=C(n,3)$

b.) $C(30, n)=C(30,18)$

Objectives:

~ Calculate Combinations
~ Distinguish between Perm. and Comb.

Can you?

Homework:

Assignment 55