

Combinations Notes and examples

*Combination- an arrangement where the order does not matter. The general rule for combinations is $nCr = \frac{n!}{(r!)(n-r)!}$. Here, n is the number of things to choose from, and r is how many of them we're choosing.

When thinking about the differences between permutations and combinations, think of combinations as a fruit salad. A fruit salad is a combination of apples, pears and grapes. We don't care what order the fruits are in, it's the same fruit salad!

Example A (on board):

How many different 3 person committees can be chosen from a class of 20 students?

Here $n = 20$ and $r = 3$ since we have 20 total people to choose from and we're choosing 3 people.

There are 1140 different committees that could be selected.

Example B (on board):

Katie is going to adopt kittens from a litter of 11. How many ways can she choose a group of 3 kittens?

Step 1 would be to determine whether the problem requires permutation or combination. Here, the order does not matter; the group Kitty, Smokey and Tiger is the same as Tiger, Smokey and Kitty. So, we'll use combinations.

Step 2 is using the formula for combinations: $11C3 = \frac{11!}{(3!)(8!)}$ where $n=11$ and $r=3$. There are 165 ways to select a group of 3 kittens from 11.