Notes Chapter 11.1

Combinations: an arrangement of object in which order is **NOT** important.

For example: in choosing a clean up committee of 5 students from this class, <u>the order</u> you are chosen <u>is not important</u>, what matters is that you were chosen to clean up.

Is taking a red and a yellow cell phone to class the same as taking a yellow and a red cell phone to class?

Combinations of n objects taken r at a time:

$$C(n,r) = {}_{n}C_{r} = {n \choose r} = \frac{n!}{r!(n-r)!}$$

n choose r

Ex. 2 Find the number of ways to buy 4 fruits out of a selection of 9 different fruits.

$$q^{C}_{4} = \frac{7!}{(9-4)! 4!} = \frac{7!}{5! 4!} = 126$$

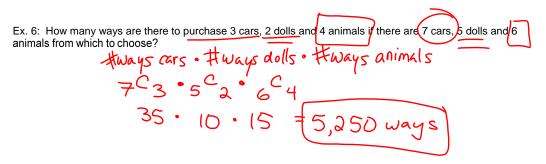
Ex. 3: Find the number of ways to ren 6 dramas from a collection of 19 dramas at the video store. Order doesn't matter (watching-order matters) $19^{\circ}_{6} = \frac{19!}{13!6!} = (27, 132)$ So how do you know when you should use permutations or combinations? The question you should ask yourself every

time is <u>"Does the order of how I choose them matter?"</u> If order matters, use permutations. If not, use combinations.

Ex. 4: How many ways are there to choose a committee of 4 people from 7 people is each person must hold an office (president, vice president, secretary, and treasurer)?

DRDER matters!
$$7^{P}4 = \frac{7!}{3!} = 840 \text{ ways}$$

Ex. 5: How many ways are there to choose a committee of 4 people from a group of 7 people? ORDER DDES NOT MATTER!



Ex. 7: In a recent survey of 40 students, 27 favor having an outside dance, and 13 oppose it. Find the PROBABILITY that in a random sample of 24 of these students, exactly 15 favor the dance and 9 oppose it.

$$\frac{27^{\circ}15 \cdot 13^{\circ}9}{40^{\circ}24} \xleftarrow{} total \# possibilities.}$$
Round
to nearest
tenth of percent $\approx 19.8\%$