PERMUTATIONS VS. COMBINATIONS

WARM UP- GROUP STUDY

- You have 5 kinds of wrapping paper and 4 different bows. How many different combinations of paper and a bow can you have?

PERMUTATION (PG.681 ALG1)

- An arrangement of a set of objects in a SPECIFIC ORDER.

- $_nP_r$, where n = the number of objects &
        r = the number of selections to make

- ! = "factorial." Ex: 5! = 5 x 4 x 3 x 2 x 1 = 120

- Example 1: How many ways can 5 children be arranged three at a time?

COMBINATION (PG.686 ALG1)

- An arrangement of a set of objects without regard to order.

- $_nC_r$, where n = the number of objects &

     r = the number of objects chosen at a time.

- <u>Number of permutations</u>
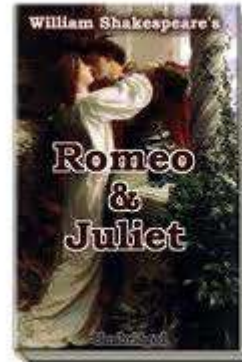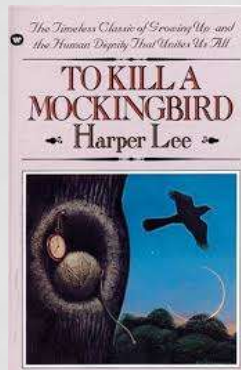
Number of permutations in one set of objects
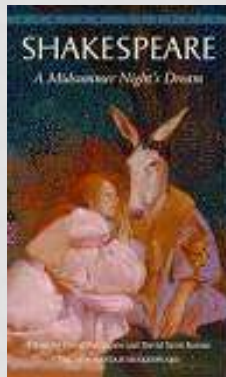
- Example 2: Find the number of combinations 12 students can make in groups of 4.

SUM IT UP…

In permutations _____, where as in combinations _____.

EXAMPLES

- Ex 3: Suppose you have to read the following books over the summer for English class next year.

In how many orders can you read the books?

Suppose you choose one of the orders at random. What is the probability that you will read the books in alphabetical order by title?

- Ex 4: Suppose you have three shirts and two pair of pants that coordinate well. Make a tree diagram to find the number of possible outfits you have.

- Ex 5: How many different batting orders can you have with 9 baseball players?

- Ex 6: A swimming pool has eight lanes. In how many ways can eight swimmers be assigned lanes for a race?

- Ex 7: Suppose you use six different letters to make a computer password. Find the number of possible six-letter passwords.

- Ex 8: In Indiana, a regular license plate has two numbers that are fixed by county, then one letter, and then four numbers. How many different plates are possible in each county? There are 92 counties in Indiana; how many plates are possible in the entire state?

- Ex 9: Twenty people report for jury duty. How many different twelve-person juries can be chosen?

Now, to check our answers using the calculator ☺