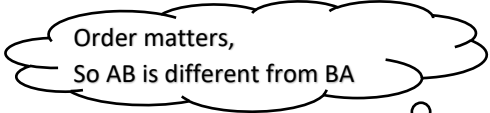


9.1 Basic Combinatorics

Target 7A: Expand the power of a binomial using the Binomial Theorem

Permutations – # of ways to permute (arrange) n objects taken r at a time

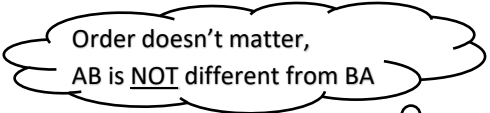
$${}_n P_r = P(n, r) = \frac{n!}{(n-r)!}$$



Order matters,
So AB is different from BA

**Combinations** – # of combinations of n objects taken r at a time

$${}_n C_r = C(n, r) = \binom{n}{r} = \frac{n!}{r!(n-r)!}$$



Order doesn't matter,
AB is NOT different from BA

*Examples*

1. Evaluate each expression without using a calculator. Check your answer with a calculator.

a) ${}_9 P_2$

b) ${}_{10} C_3$

2. How many distinguishable 11-letter words (not necessarily in the dictionary) can be formed using the letters in...

a) PROBABILITY

b) VICISSITUDE

Unit 7 (Chapter 9): Discrete Mathematics

3. Count the number of ways that each procedure can be done.

a) Arrange 4 books from left to right on a bookshelf.

b) Elect a President, Vice-President, Treasurer, and Secretary from a Student Council, which consists of 17 members.

c) Select a 5-person fundraising committee from the Book Club, which consists of 21 members.

d) Unique tickets that can be printed for the Illinois Pick-5 lottery drawing, where players must match all five numbers on their ticket, out of 48 possible numbers.

More Practice

Permutations & Combinations

<https://www.khanacademy.org/math/precalculus/prob-comb>

<https://www.khanacademy.org/math/precalculus/prob-comb/combinatorics-precalc/v/permutation-formula>

<http://www.coolmath.com/algebra/20-combinatorics/03-Permutations-01>

<http://www.coolmath.com/algebra/20-combinatorics/04-permutations-repeats-reruns-01>

<https://betterexplained.com/articles/easy-permutations-and-combinations/>

<https://www.mathsisfun.com/combinatorics/combinations-permutations.html>

<https://www.khanacademy.org/math/precalculus/prob-comb/combinations/v/introduction-to-combinations>

<http://www.coolmath.com/algebra/20-combinatorics/05-combinations-01>

https://www.youtube.com/watch?annotation_id=annotation_50580&feature=iv&src_vid=hJRXXKq2GEO8&v=H9VYDGuxqGg

https://www.youtube.com/watch?v=s_LfN4ItCs4

<https://www.youtube.com/watch?v=0NAASclUm4k>

<https://www.youtube.com/watch?v=3S8hs6aEts0>

Homework Assignment

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