ONE QUESTION FIRST

Selecting r items from n distinct items: whether the order of the selected items matters decides which count applies.

SELECTING R FROM N

r items from n

split by **whether order matters**

P

CASE 1

order matters

Permutation

an ordered arrangement; see permutations

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

C

CASE 2

order does not matter

Combination

an unordered selection

$$\binom{n}{r} = \frac{n!}{r!(n-r)!}$$

VARIANTS

Each family has variants: repetition, identical items, circular arrangements and constraints for permutations; groups, distributions and compositions for combinations.