Combinatorial Analysis – Summary

Summary Table

Concept	**Definition**	**Formula (no repetition)**	**With repetition**
Arrangements	Ordered selection of k elements from n. Order matters.	$A_k^n = \dfrac{n!}{(n-k)!}$	n^k
Combinations	Unordered selection of k elements from n. Order does not matter.	$C_k^n = \binom{k}{n} = \dfrac{n!}{k!(n-k)!}$	$\binom{n+k-1}{k}$
Permutations	Ordered arrangement of all n elements.	$P_n = n!$	$\dfrac{n!}{n_1!\, n_2! \cdots n_r!}$