BASIC COUNTING PROBLEMS AND THEIR FORMULAS

In the table, k = number of elements of a set or of distinct types in a multiset.

	No repetition Set $\{a_1, \ldots, a_k\}$	**Unlimited repetition** Multiset with infinite multiplicities $\{\infty \cdot a_1, \ldots, \infty \cdot a_k\}$	**Limited repetition** Finite multiset $\{n_1 \cdot a_1, \ldots, n_k \cdot a_k\}$
Ordered (r = length)	r-Permutations $k(k-1)\cdots(k-r+1)$	Sequences k^r	Permutations $\dfrac{(n_1 + \cdots + n_k)!}{n_1! \cdots n_k!}$
Unordered (r = size of combination)	r-Combinations $\dbinom{k}{r}$	r-Combinations $\dbinom{k+r-1}{r}$	r-Combinations Chapter 6 (Inclusion/exclusion)