

Permutation Group

A permutation group, within the realm of abstract algebra, is a group that consists of all possible permutations of a given set. A permutation is essentially a rearrangement of the elements of the set. The group's operations are defined by composition of permutations, ensuring closure and including the identity permutation. The order of a permutation group matches the factorial of the set's size, with each element representing a bijective mapping of the set onto itself. Permutation groups are foundational in studying symmetry, group actions, and combinatorics. Key examples include symmetric groups (which permute a finite set) and alternating groups (which relate to even permutations).