

Base sizes for the symmetric and alternating groups

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A base of a permutation group is a set of the elements on which it is acting, that is only fixed by the identity element of that permutation group. The base size of a permutation group is the minimum possible size for a base.

These concepts have been rediscovered and studied in the context of automorphism groups of combinatorial objects: if a permutation group is the automorphism group of an object, then a distinguishing set is a collection of "points" of the object that are only fixed by the identity automorphism. The distinguishing number is the smallest size of such a set.

I will present new results about the base sizes for two non-standard actions of the symmetric group $\text{Sym}(n)$: its action on partitions, and its action on subsets of a fixed cardinality. For the first of these, I will also present results about the corresponding base sizes for the alternating group.