

Derangements in primitive permutation groups and applications

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A derangement is a permutation with no fixed points. One of the oldest theorem in probability, the Montmort limit theorem, says that the proportion of derangements in finite symmetric groups S_n tends to e^{-1} when n tends to infinity. Also a classical theorem of Jordan implies that every finite transitive permutation groups of degree greater than 1 contains derangements. This result has many applications in number theory, topology, game theory, combinatorics, and character theory. There are several interesting questions on the order and the number of derangements that have attracted much attention in recent years. In this talk, I will discuss some of these questions and I will report on recent results on finite primitive permutation groups with some restriction on derangements. This is joint work with Timothy C. Burness.