Abstract

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Let $r(n,k)$ denote the number of ways we can place k rooks on an $n \times n$ chessboard so that no two rooks are in the same row or column. The generating function for these numbers is the polynomial

$$R_n(x) = \sum_{k=0}^{n} r(n,k)x^k.$$

We can also define a a generating function for a class of combinatorial objects called colored permutation. By showing that these two generating functions are equivalent, we can deduce information about colored permutations from a $r(n,k)$. We will discuss the generating function for rooks, and use this generating to find out information on colored permutations.