

1086-05-991

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FL 32611-8105. *New upper bounds for permutations avoiding 1324 and other extremal patterns.*

We show that the number of permutations of length n avoiding the pattern 1324 is at most $(7 + 4\sqrt{3})^n$. Then we generalize our method to find upper bounds for permutations avoiding the pattern $q_k = 13254 \cdots k(k-1)$ if k is odd and $q_k = 13254 \cdots (k-1)(k-2)k$ if k is even. Our results, together with numerical evidence suggest that if q is any pattern of length k , then the number of permutations of length n avoiding q is at most $(2.25k^2)^n$.

Our proofs will be based on injective encodings of pattern-avoiding permutations by pairs of words over finite alphabets that avoid certain factors. (Received September 17, 2012)