MATHEMATICS MAGAZINE PROBLEM

1684. *Proposed by Ethan S. Brown, Massachusetts Institute of Technology, Cambridge, MA., and Christopher J. Hillar, University of California, Berkeley, CA.*

Let S be the set of all n letter words in two letters, say a and b. Define an equivalence relation on S as follows: given a word W, the reverse of W, the complement of W (that is, change all a's and b's and all b's to a's), and the reverse of the complement are all equivalent to W. Find the number of equivalence classes of S that do not contain any palindromes.