# ABSTRACTS OF PAPERS

## SUBMITTED FOR PRESENTATION TO THIS SOCIETY

The following papers have been submitted to the Secretary and the Associate Secretaries of the Society for presentation at meetings of the Society. They are numbered serially throughout this volume. Cross-references to them in the reports of the meetings will give the number of this volume, the number of this issue, and the serial number of the abstract.

67. Professor A. D. Campbell: *Pseudo-covariants of an n-ic in m variables in a Galois field that consists of terms of this n-ic.*

If we subject an $n$-ic in $m$ variables in a Galois field of order $p^s$ to linear homogeneous transformations with coefficients and variables in the same Galois field, we find sets of terms of this $n$-ic behaving in a strange fashion. We call these sets of terms pseudo-covariants. For example, we note that the only terms in the $n$-ic that can furnish terms in the transformed equation whose factors all have exponents less than $p$ are those terms in the original equation of the $n$-ic whose factors all have exponents less than $p$. If the $n$-ic has no such terms as described above, we consider the terms in the $n$-ic that have each just one of the exponents $u$ such that $p \leqq u < p^2$, while all the other exponents are less than $p$. In a similar manner we define the other pseudo-covariants of an $n$-ic. This paper makes a study of these pseudo-covariants and of the transformations of their coefficients caused by the linear transformations of the variables. (Received January 21, 1933.)

68. Mr. Morris Halperin: *The non-analytic character and the areas of Kasner's convex curves.*

A Kasner convex curve is defined as the limit of a sequence of convex polygons, each of which is obtained from the preceding one by measuring off from both ends of every one of its sides the $r$th part of its length and cutting off the corners; $r < 1/2$. Elsewhere in this Bulletin (abstract No. 39–1–63), Miss Lawrence points out that, except for $r = 1/4$, these curves are non-analytic. This property of these curves the present author has proved in two ways: (1) by means of differential equations, (2) by a consideration of the ratios between certain areas associated with these curves. The expression for the area of a Kasner convex curve is linear in the areas of two successive polygons of the defining sequence, and rational in $r$. (Received February 1, 1933.)

69. Dr. J. L. Doob (National Research Fellow): *The ranges of analytic functions.*

Let $f(z)$ be a function analytic in the interior of the unit circle of the $z$-plane Suppose that $f(0) = 0$, and that there is an arc $A$ on $|z| = 1$ such that when