ABSTRACTS OF PAPERS

SUBMITTED FOR PRESENTATION TO THE 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.

ALGEBRA AND THEORY OF NUMBERS

198. Warren Ambrose: *Structure theorems for a special class of normed rings.*

Normed rings (in the sense of Gelfand, but without assumptions of commutativity or of a unit) are considered which satisfy the following two conditions: (1) the underlying Banach space is a Hilbert space, (2) to each x in the ring there is an "adjoint," x^*, with the properties that the linear transformations defined by $y \to x^*y$, and $y \to yx^*$ are the adjoint operators of $y \to xy$ and $y \to yx$. The structure of such rings is completely determined. It is shown that such a ring is always a direct sum of simple rings and that a simple ring is always a full matrix ring, of either finite or infinite dimension. By a full matrix ring of infinite dimension is meant here the set of all functions of two variables (complex-valued) for which the sum of the squares of the absolute values of the elements converges, with the expected definitions of the operations in the ring. (Received July 6, 1944.)

199. E. T. Bell: *Separable diophantine equations.*

A monomial in the independent indeterminates $x_1, \cdots, x_n$ is called elementary if at least one of the indeterminates occurs only to the first power. A sum of elementary monomials with integer coefficients, equated to zero, is called an extended multiplicative equation. Systems of extended equations are called separable if their complete integer solution is reducible to that of a multiplicative system (methods for the complete solution of which are known) and a system of linear diophantine equations, or to either of these alone. Among the applications are the complete integer solution of $S_m = S_n$, where S_m is a sum of m squares with arbitrary integer coefficients. The methods used apply to diophantine equations in any unique factorization domain, in particular to an integral domain with a euclidean algorithm. The paper will appear in the Transactions. (Received July 10, 1944.)

200. L. M. Blumenthal: *Note concerning an extension of the notion of matrix rank.*

Investigations concerning the imbedding of metric spaces in elliptic spaces suggested an extension of the notion of matrix rank in terms of which certain metric properties of the space could be algebraically formulated and described in a better way than by the use of classical concepts. If $\mathcal{A} = (a_{ij})$, $\mathcal{E} = (\epsilon_{ij})$ are two $m \times n$ matrices, $\mathcal{A}$ is said to have $\mathcal{E}$-relative rank r provided the matrix $(a_{ij}\epsilon_{ij})$ $(i = 1, 2, \cdots, m;$