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

172. Warren Ambrose: *A variation of a theorem of I. E. Segal on the group ring of a compact group.*

It is shown that the L_2-ring of a compact group is a direct sum of full matrix algebras. This is done using the special properties of the L_2-ring, and its ideal theory, without reference to the classical theory of group representations, though the proof parallels, in part, the proof of the Peter-Weyl theorem. (Received April 14, 1944.)

173. Reinhold Baer: *Crossed isomorphisms.*

The 1:1 correspondence f, mapping the elements in the group G upon the elements in the group H, is termed a crossed isomorphism of G upon H, if there exists to every element x in G an endomorphism $e(x)$ of G such that $(u^{e(v)}v)^f = u^f v^f$ for u, v in G. The position of crossed isomorphisms between ordinary isomorphisms and 1:1 correspondences is discussed and their relation to projectivities of G upon H is investigated. If the endomorphism $e(x)$ of G maps every subgroup of G upon itself, then f is termed an integral crossed isomorphism. All the groups that are integral crossed isomorphic maps of abelian groups are determined. (Received April 28, 1944.)

174. R. J. Duffin and R. S. Pate: *Structure elements of quasigroups. II.*

This paper continues the study of the concepts of *rank* and *left associativity* (Duke Math. J. vol. 10 (1943) p. 743). A *left set* is a set L of elements such that $(Lx)y = L(xy)$ for every pair (x, y) of elements of Q. The *middle rank* of Q is the number of permutations of the columns of the multiplication table of Q which are simultaneously permutations of the rows. The ranks of Q divide its order. A Q of middle rank r contains a sub-Q of order r whose elements consist of all the middle associative elements $\{m\}$, that is, $x(my) = (xm)y$. These considerations furnish a practical test to determine whether a quasigroup is a group because thc rank of a group is equal to the order. The meet, join and product of left sets are left sets. The set of elements $\{a\}$ such that $La = L$ is both a left set and a sub-Q. Unlike group theory, quotient Q's may be defined even when there are no sub-Q's. The lattice of quotient Q's is modular. The existence of a quotient quasigroup is equivalent to the existence of a set C satisfying certain associative and commutative laws. Permutation of rows, columns or symbols of the multiplication table leaves both rank and the lattice of weak quotients invariant. (Received May 31, 1944.)

175. R. J. Duffin and R. S. Pate: *Structure elements of quasigroups. III.*

This paper is a study of the three groups generated by the right and left substitutions of a quasigroup; G_r, G_l, and G. Group theoretic theorems concerning systems of imprimitivity are found to be useful in this connection. A quotient expansion of Q is equivalent to a system of imprimitivity of G. The lattice of quotients is isomorphic to a certain (synthetic) lattice of intransitive normal subgroups of G. If K is the subgroup corresponding to the quotient Q', then the G of Q' is the abstract group G/K. The Jordan-Hölder and Schrierer-Zassenhaus developments follow from these considerations. A left coset expansion of Q is equivalent to a system of imprimitivity in G_r. The lattice of left coset expansions is isomorphic to a certain lattice of subgroups of G_r. These results are related to abstract groups by employing a method of R. Baer (Trans. Amer. Math. Soc. vol. 46 (1939) pp. 110–141). Special types of quotient quasigroups are classified by the isotopies sending them into simpler types. A general feature noted is that the associative properties of the quasigroup are often reflected as commutative properties of the groups. (Received May 31, 1944.)

176. O. F. G. Schilling: *Automorphisms of fields of formal power series.*

Let $F=\Omega\{t\}$ be a field of power series of one variable over the field Ω. This note deals with the structure of the automorphism group of F/Ω. It is shown how the concepts of the Hilbert theory can be carried over so as to provide universal ramification groups for the totality of subfields $\Omega \subset L \subset F$ over which F is normal. (Received May 31, 1944.)

177. O. F. G. Schilling: *Noncommutative valuations.*

Let D be a division algebra and V a valuation on D with values in a simply ordered 1-group. It is shown that the ideal theory in D with respect to V can be developed as in the commutative case provided proper safeguards are observed. It turns out that the division algebras in question must be transcendental over their centers. Certain algebras may be considered as crossed extensions of division algebras by 1-groups. (Received May 31, 1944.)

178. S. M. Ulam and C. J. Everett: *On ordered groups.*

An o-group G is an l-group (G. Birkhoff, *Lattice ordered groups*, Ann. of Math. vol. 43 (1942)) with the lattice property weakened to that of Moore-Smith. An o-group is embeddable in a complete ordered group if and only if it is integrally closed. If the commutator group of an integrally closed o-group is in its center, it is commutative. The conjecture of the "suggestion" on p. 329, loc. cit., is thus proved. Counterexamples are given for Problems 1, 2, loc. cit. The group of functions $ax+A$, a, A real, $a>0$, under composition admits no integrally closed order. Every l-group is embeddable in a sequence complete group in the sense of o-convergence. The results of Everett, *Sequence completion of lattice moduls*, Duke Math. J. vol. 11 (1944), are extended to noncommutative groups. Various orders in the free group of two generators establish curious properties of the group of topological transformations of the line into itself. (Received April 25, 1944.)