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

73. A. P. Hillman: *On identities for differential polynomials.*

The author generalizes his previous theorems (see Bull. Amer. Math. Soc. vol. 49 (1943) pp. 711–712) as follows. Let $F \neq 0$, $C_1, \cdots, C_s$ be differential polynomials, and let $C_1P_1 + \cdots + C_sP_s = 0$, where the P_i are distinct power products of degree d_i and order p_i in F and its derivatives. Also let $p_j > p_k$ whenever $d_j < d_k$. Then each C_i holds F. There is an analogue for partial differential polynomials. (Received March 29, 1945.)

74. A. P. Hillman: *Theorems obtained from the Newton polygon process for differential polynomials.*

Two of Ritt's theorems (see §8, Amer. J. Math. vol. 60 (1938) pp. 1–43) are generalized to include the following. Let A and B be forms (ordinary or partial differential polynomials), let A have constant coefficients, and let B hold A. Then the form B^* composed of the terms of B for which $ad+bw$ is least holds the corresponding form A^*. Here d stands for degree, w stands for weight, and a and b are any real numbers. (Received March 29, 1945.)

75. Bjarni Jonsson: *On unique factorization problem for torsionfree abelian groups.*

The problem has been raised whether the unique factorization theorem holds for all groups which are (finite) direct products of indecomposable groups (cf. A. Kurosch, Math. Ann. vol. 106). The solution is negative, even for the class $\mathfrak{H}$ of torsionfree abelian groups of finite rank. In fact, let a, b, c, d be rationally independent real numbers. Let A, B, C, D be additive groups of real numbers, defined as follows. A and B consist of all numbers $5^n ia$ and $5^n ib + 7^n jc + 11^n kd + (l/3)(b-c) + (m/2)(b+d)$ respectively; i, j, k, l, m, n being integers. C and D consist of those members of $A \times B$ which are of the form $t(3a-b)+uc$ and $t(2a-b)+ud$ respectively; t and u being rational numbers. Then $A \times B = C \times D$, all four groups being indecomposable and nonisomorphic. However, a unique factorization theorem in a weaker form applies to $\mathfrak{H}$. The two groups A, B are called equivalent, $A \equiv B$, if A is isomorphic with a subgroup of B and conversely. A group A, of positive rank, is strongly indecomposable if $A \equiv B \times C$ never holds unless $A \equiv B$ or $A \equiv C$. Then every group in $\mathfrak{H}$ is equivalent to a direct product of strongly indecomposable groups; and if it is equivalent to two such products, then the number of factors in both products is the same, and the factors are (apart from order) respectively equivalent. (Received March 24, 1945.)