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

252. D. H. Lehmer: *Recurrence formulas for certain divisor function.*

Certain numerical functions giving the excess of the number of divisors of n of one sort over the number of divisors of n of a second sort have arisen from the theory of binary quadratic forms and from the theory of elliptic functions. A systematic discussion of these has been given in several papers by Glaisher. In this paper it is pointed out that these functions are sums over divisors of certain periodic Lucas' functions. A general recurrence formula embracing all Lucas' functions is derived in an elementary way from Jacobi's celebrated triple product identity. Special applications to the Pell equation and Fibonacci's series are given. (Received July 6, 1942.)

253. Dorothy M. Smiley: *A note on Burnside's problem.*

William Burnside (Proceedings of the Cambridge Philosophical Society, vol. 20 (1921), pp. 482–484), Dorothy Manning (Transactions of this Society, vol. 40 (1936), pp. 324–342), and Rudolf Kochendörffer (Schriften des Mathematischen Seminars und des Instituts für angewandte Mathematik der Universität Berlin, vol. 3 (1937), pp. 155–180) have endeavored to prove that a simply transitive permutation group of degree p^{a+b} (p prime) which contains a transitive Abelian subgroup of type (p^a, p^b) with $a \neq b$ is neither primitive nor simple. All three papers contain mistakes. Those occurring in Kochendörffer's paper are corrected in this note. (Received July 20, 1942.)

254. H. S. Thurston: *The solution of p-adic equations.*

If the congruence $f(x) \equiv 0 \pmod{p}$ has a solution $x = a_0$ such that $f'(a_0) \not\equiv 0 \pmod{p}$, then the equation $f(x)=0$ has a p-adic root $\alpha = a_0 + a_1 p + a_2 p^2 + \cdots$, the coefficients $a_0, a_1, a_2, \cdots$, being successively determined by a method analogous to Newton's method for approximating irrational roots. If, however, $f'(a_0) \equiv 0 \pmod{p}$, the method not only fails to determine α, but leaves in doubt the existence of such a root. The present paper introduces a sequence of functions $F_i(x)$, by means of which it is possible, in a finite number of steps, to ascertain the number of roots of $f(x)=0$ in the p-adic field Ω_p. By a technique analogous to Horner's method for approximating irrational roots, $f(x)=0$ may be solved for any root α whose existence has been demonstrated. (Received July 27, 1942.)