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.

239. Professor A. A. Albert: *Normal division algebras over algebraic number fields not of finite degree.*

The author proves here that every normal division algebra of degree n over an algebraic number field not of finite degree is cyclic and has exponent n. This theorem was known only for algebraic number fields of finite degree. By a trivial example he also shows that there exist non-cyclic normal simple algebras over algebraic number fields not of finite degree (while this is known not to be true over fields of finite degree). He finally considers also the problem of the equivalence of normal division algebras, reducing the problem for the fields here considered to the already solved problem for the case of finite degree. (Received July 22, 1933.)

240. Professor E. T. Bell: *Exponential numbers.*

An examination of some faulty physical calculations suggested the following problem. Let the power series expansion of $f(x)$ and the MacLaurin expansion of $\exp f(x)$ be absolutely convergent and termwise differentiable. It is required to devise some readily applicable arithmetical check on the accuracy of the heavy algebra usually involved in carrying the MacLaurin expansion to more than ten terms. This is provided in the present paper by congruences which the coefficient of $x^n/n!$ $(n=1, 2, \cdots)$ in the MacLaurin expansion of $\exp [f(x)-f(0)]$ must satisfy. Applications of the criteria disclose errors in the tabulated expansions, some of which have been copied from one handbook into several later compilations. (Received July 31, 1933.)

241. Professor E. T. Bell: *Polynomial diophantine systems.*

The method of reciprocal arrays, developed by the author for purely multiplicative diophantine systems, is here extended to diophantine systems consisting of any number of polynomials, in any numbers of indeterminates, of any degrees. Such systems as are solvable by the method are *completely* solvable (*all* sets of integers satisfying the system are given explicitly in parametric form). The theory is first developed for an abstract commutative ring. Application is then made to diophantine polynomial systems in any algebraic number field with class number unity. (Received July 21, 1933.)

242. Professor H. R. Brahana: *On cubic congruences.*

Any two irreducible cubic congruences with coefficients in the same modu-