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

347. A. T. Brauer: *Limits for the characteristic roots of a matrix.* II.

Let $A=(a_{\kappa\lambda})$ be a square matrix of order n. Set $P_\kappa=\sum_{\lambda=1,\lambda\neq\kappa}^{n}|a_{\kappa\lambda}|$. In an earlier paper (Duke Math. J. vol. 13 (1946)) it was proved that each characteristic root ω_ν of A must lie in at least one of the n circles $|z-a_{\kappa\kappa}|\leqq P_\kappa$. This result will be improved as follows. Each characteristic root must lie in at least one of the $C_{n,2}$ ovals of Cassini $|z-a_{\kappa\kappa}|\,|z-a_{\lambda\lambda}|\leqq P_\kappa P_\lambda$. It follows in particular that, for $\nu=1, 2, \cdots, n$, $|\omega_\nu|\leqq\max_{\kappa,\lambda=1,2,\cdots,n}\{|a_{\kappa\kappa}|+(P_\kappa P_\lambda)^{1/2}\}$. Received September 25, 1946.)

348. H. W. Brinkmann: *On the prime divisors of a polynomial with integral coefficients.*

Let $f(x)$ and $g(x)$ be polynomials with rational integral coefficients. It is shown in this paper that there exist infinitely many primes p that are divisors of both polynomials, that is, there exist integers a, b so that $f(a)\equiv g(b)\equiv 0 \pmod{p}$. The proof is not elementary. As a corollary it follows that it is impossible for all but a finite number of prime divisors of a polynomial to belong to the same residue class $kz+m$ if $m\not\equiv 1 \pmod{k}$. This answers a question raised by A. T. Brauer (Duke Math. J. vol. 13 (1946) pp. 235–238). The problem of deciding when there are infinitely many prime divisors of $f(x)$ that are *not* divisors of $g(x)$ is also attacked and as a consequence it is possible to generalize Brauer's main theorem in the paper just referred to. (Received August 26, 1946.)

349. E. R. Kolchin: *Algebraic matric groups and the Picard-Vessiot theory of homogeneous linear ordinary differential equations.*

This is a modern algebraic development of the Galois theory of homogeneous linear ordinary differential equations of Picard and Vessiot. Based on a theory of algebraic groups of matrices (developed here, for any algebraically closed field of arbitrary characteristic, without recourse to Lie theory) and on the Ritt theory of algebraic differential equations, the paper extends the Picard-Vessiot theory, fills in its main gaps, and brings it up to present day standards of rigor. The coefficient domain is an arbitrary differential field of characteristic 0 with an algebraically closed field of constants. Among the results obtained are the analogue to the fundamental theorem of Galois theory (one-to-one correspondence between subgroups and intermediate fields), and an extension of Vessiot's big theorem on solvability "by quadratures." The first part of the development is quite general and contains the