# 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

### 1. Richard Brauer: *On the arithmetic in a group ring*. II. Preliminary report.

The paper is a continuation of an earlier paper (Proc. Nat. Acad. Sci. U.S.A. vol. 30 (1944) pp. 109–114). The arithmetic in the group ring of a group of finite order over suitable algebraic number fields is studied. In particular, the prime ideals are considered. In the first paper, a connection has been established between these prime ideals and the prime ideals of the group rings of certain subgroups. New relations of this kind are given. On the basis of these results, a number of statements concerning the characters of the group can be made, provided that the corresponding statements concerning the characters of the subgroups are known. If $p^a$ is the highest power of a rational prime $p$ dividing the order of the group, it is shown that the number of characters belonging to the same $p$-block lies below a bound depending only on $p^a$. This implies a corresponding result for the prime ideal divisors of $p$ belonging to the same block. A refinement of the orthogonality relations for group characters is given. (Received October 16, 1945.)

### 2. Paul Erdös and Irving Kaplansky: *The asymptotic number of Latin rectangles*.

It has been conjectured that the number of $n$ by $k$ Latin rectangles is asymptotic to $(n!)^k e^{-k(k-1)/2}$. In this paper the conjecture is proved not only for $k$ constant (as $n \to \infty$) but for $k < (\log n)^{3-\epsilon}$. Certain closer approximations are also found. (Received October 18, 1945.)

### 3. B. W. Jones: *Equivalence of quadratic forms over the ring of 2-adic integers*.

Any two quadratic forms $f$ and $g$ with coefficients in $R(p)$, the ring of $p$-adic integers, are equivalent in $R(p)$ to $2^{t_1}f_1+2^{t_2}f_2+\cdots+2^{t_k}f_k$ and $2^{s_1}g_1+2^{s_2}g_2+\cdots+2^{s_j}g_j$ where $t_1<t_2<\cdots<t_k$, $s_1<s_2<\cdots<s_j$ and each $f_i$ and $g_i$ is a form in $R(p)$ of unit determinant. If $h$ is that portion of $f$ containing $f_i, f_{i+1}, \cdots, f_{i+r}$ it is called an 8-block if it satisfies the following two conditions for $\lambda=8$: (1). $i=1$ or $2^{t_i}f_i \equiv 0 \pmod{4\cdot 2^{t_{i-1}}}$, (2). $i+r=k$ or $2^{t_{i+r+1}}f_{i+r+1} \equiv 0 \pmod{2^{t_{i+r}}\cdot\lambda}$. If $h$ is not an 8-block but satisfies conditions 1 and 2 for $\lambda=4$, it is called a 4-block. These two concepts are included in the term $\lambda$-block for $\lambda=8$ or 4. The following result is proved: if $f$ and $g$ are two forms written as above they are equivalent in $R(2)$ if and only if $k=j$, for every $i$, $s_i=t_i$, and $f_i$ and $g_i$