THE JUNE MEETING IN PULLMAN

The five hundred thirty-sixth meeting of the American Mathematical Society was held at the State College of Washington in Pullman, Washington, on Saturday, June 15, 1957, preceded by a meeting of the Mathematical Association of America on Friday. There were 97 registrants, including 70 members of the Society.

By invitation of the Committee to Select Hour Speakers for Far Western Sectional Meetings, Professor M. M. Day delivered an address on Rotundity and smoothness. He was introduced by Professor Klee, and the sessions for contributed papers presided over by Professors Paul Civin and J. M. Kingston.

Following are abstracts of papers presented at the meeting, those whose numbers are followed by "t" having been given by title. On joint papers, the presenter's name is followed by "(p)". Dr. Schmidt was introduced by Professor Ostrom.

ALGEBRA AND THEORY OF NUMBERS

586. W. E. Barnes and H. Schneider (p): The group-membership of a polynomial in an element algebraic over a field.

Let $F$ be a field, $R$ an arbitrary extension ring of $F$, and let $a$ be an element of $R$ algebraic over $F$, with minimum polynomial $m(x)$. If $g(x) \in F[x]$, the polynomial $g(a)$ is called a group-element in $R$ if there exists a subgroup of the multiplicative semigroup of $R$ to which $g(a)$ belongs. It is proved that $g(a)$ is a group-element in $R$ if and only if the greatest common divisors in $F[x]$ of $g(x)$ and $m(x)$ and of $g(x)^2$ and $m(x)$ are equal, in which case $g(a)$ is a group-element even in $F[a]$. It follows that $g(a)$ is a group-element in $R$ for every polynomial $g(x)$ in $F[x]$ if and only if the irreducible factors of $m(x)$ are simple. This extends a result due to Farahat and Mirsky on the group membership of a matrix polynomial (American Math. Monthly vol. 63 (1956) pp. 410–412). (Received May 1, 1957.)

587. R. A. Beaumont (p) and R. S. Pierce: Partly transitive modules with proper isomorphic submodules.

The problem of classifying those $R$-modules $M$ over a principal ideal domain $R$ which have proper isomorphic submodules is considered. Such modules are called I-modules. For modules of finite rank, a generalization of a theorem of Kaplansky is obtained: Let $M$ be a module of finite rank which splits. Then $M$ is an I-module if and only if $M/T$, where $T$ is the torsion submodule of $M$, is not divisible. Using standard techniques from the theory of abelian groups, it is proved that divisible modules and reduced modules may be considered separately, and the divisible case is disposed of easily. Reduced torsion-free modules are I-modules. It is shown that if the cardinality of a minimal set of generators of a primary reduced module $M$ exceeds $|[R]|^{\aleph_0}$, where $|[R]|$ is the cardinality of $R$, then $M$ is an I-module. Let $x$ and $y$ be elements of a primary module $M$ and let $U(x) = (\alpha_1, \alpha_2, \cdots, \alpha_n, \cdots)$ and $U(y) = (\beta_1, \beta_2, \cdots, \beta_n, \cdots)$ be their Ulm sequences. We write $U(x) < U(y)$ if $\alpha_i \leq \beta_i$ for