Mathematics Contest of the Metropolitan New York Section

the likelihood relative to the parameters characterizing A is done in most cases by standard mathematical procedures.

6. *Generalized quaternions*, by Professor Gordon Pall, Illinois Institute of Technology.

With every ternary quadratic form is associated a quaternion algebra, which is closely related to the automorphs of the form. A change of basis of the algebra is accompanied by a corresponding linear transformation of the form. A ring of integral elements with unity is associated in a simple way with a ternary form having integral coefficients. Classes of ideals within such rings are associated with classes of quaternary quadratic forms within the genus of the norm form. The quadratic congruence $\bar{x}ax \equiv b$ (mod p^r), where a and b are given pure quaternions, p is a rational prime, and x is a variable quaternion, has interesting properties. For example, if a and b are primitive and of norm zero mod p, and $p+d$, $r=1$, and p is odd, then the congruence is solvable if and only if the trace $2\sum A_{\alpha\beta}a_{\alpha}b_{\beta}$ is a quadratic residue mod p, with a special interpretation if the trace is zero mod p. Thus there are two residue systems of such pure vectors mod p. In a similar situation for the prime 2, there are four residue systems. The results for the prime 2 and odd discriminant are given in detail. There is a reciprocity law similar to the Hilbert form of the quadratic reciprocity law. Here primes p behave differently according as the Hansel-Hasse invariant c_p of the ternary form is $+1$ or -1.

MARGARET F. WILLERDING, *Secretary*

MATHEMATICS CONTEST OF THE METROPOLITAN NEW YORK SECTION

The Committee on Contests and Awards of the Metropolitan New York Section of the Association has announced the results of its mathematics contest which was held on May 10, 1951. This contest was open to high school students in the area of the Section. More than 5,000 students participated. It seems evident that the contest is accomplishing its purpose of creating the greatest possible interest in mathematics.

The Association's Bronze Cup was awarded to Brooklyn Technical High School for a score of 402 points out of a possible 450 points. This trophy is given to the school that has the highest total score on the three best papers which it submits.

Certificates of Merit were awarded to the highest ranking student in each county. The following students received these awards: J. S. Lew, Mamaroneck Senior High School, Westchester County; P. H. Monsky, Brooklyn Technical High School, Kings County; Lewis Iscol, Bronx High School of Science, Bronx County; Alicia E. Larde, Marymount School, New York County; T. E. Douglass, Saint Bonaventure's High School, Passaic County; E. J. Stolz, St. Joseph's Normal Institute, Dutchess County; R. A. Howard, Lynbrook High School, Nassau County, G. L. Smith, Chatham High School, Morris County; J. A. Wolf, College High School, Essex County; R. J. Sibner, Forest Hills High School, Queens County; and J. R. Hastings, Rutherford High School, Bergen County.

In addition to the above awards, Honor Keys were awarded to the following seven students who ranked first in their respective schools for the contest of 1950 and also that of 1951: J. S. Lew, Mamaroneck Senior High School, Mamaroneck, New York; P. H. Monsky, Brooklyn Technical High School, Brooklyn,

New York; Stephen Weingram, DeWitt Clinton High School, Bronx, New York; G. L. Smith, Chatham High School, Chatham, New Jersey; Lois B. Mitchell, A. B. Davis High School, Mount Vernon, New York; P. G. Federbush, Weequahic High School, Newark, New Jersey; and Anna Chernovitz, Washington Irving High School, New York, New York. Also individual awards, in the form of a button or pin bearing the facsimile of the seal of the Mathematical Association of America, were given to each student who won first place in his school.

Copies of the contest questions and other information about the contest may be obtained from Professor W. H. Fagerstrom, the City College of the City of New York, New York 31, New York. Professor Fagerstrom has served as Chairman of the Committee on Contests and Awards and the other members of the committee are as follows: Brother Bernard Alfred, Manhattan College; Professor H. F. Fehr, Teachers College, Columbia University; Mr. Julius Freilich, Brooklyn Technical High School; Professor J. J. Kinsella, School of Education, New York University; Professor V. S. Mallory, State Teachers College, Montclair, New Jersey; Mr. K. B. Morgan, Mt. Kisco High School, Mt. Kisco, New York; Mr. Aaron Shapiro, Midwood High School, Brooklyn, New York.

CALENDAR OF FUTURE MEETINGS

Thirty-fifth Annual Meeting, Brown University, Providence, Rhode Island, December 29, 1951.

The following is a list of the Sections of the Association with dates of future meetings so far as they have been reported to the Associate Secretary.

ALLEGHENY MOUNTAIN, Waynesburg College Waynesburg, Pennsylvania, May 10, 1952.

ILLINOIS, Western Illinois State College, Macomb, May 9–10, 1952.

INDIANA, Indiana University, Bloomington, Spring, 1952.

IOWA, Coe College, Cedar Rapids, April 18–19, 1952.

KANSAS

KENTUCKY, University of Kentucky, Lexington.

LOUISIANA-MISSISSIPPI, Northwestern State College, Natchitoches, Louisiana, February 15–16, 1952.

MARYLAND-DISTRICT OF COLUMBIA-VIRGINIA, National Bureau of Standards, Washington, D. C., December 8, 1951.

METROPOLITAN NEW YORK, Spring, 1952.

MICHIGAN, University of Michigan, Ann Arbor, April 12, 1952.

MINNESOTA

MISSOURI, Lindenwood College, St. Charles, Spring, 1952.

NEBRASKA

NORTHERN CALIFORNIA, University of California, Berkeley, January 26, 1952.

OHIO, April 19, 1952.

OKLAHOMA, Oklahoma City University, October 12, 1951.

PACIFIC NORTHWEST, University of Oregon, Eugene, June 20, 1952.

PHILADELPHIA, University of Pennsylvania, Philadelphia, November 24, 1951.

ROCKY MOUNTAIN, Western State College, Gunnison, Colorado, May, 1952.

SOUTHEASTERN, Georgia Institute of Technology and Agnes Scott College, Atlanta, March 21–22, 1952.

SOUTHERN CALIFORNIA, Occidental College, Los Angeles, March 8, 1952.

SOUTHWESTERN, University of Arizona, Tucson, April 11–12, 1952.

TEXAS, East Texas State Teachers College, Commerce, April, 1952.

UPPER NEW YORK STATE, Hobart and William Smith Colleges, Geneva, May, 1952.

WISCONSIN