# PROCEEDINGS

#### OF THE

# AMERICAN MATHEMATICAL SOCIETY

#### EDITED BY

R. P. BOAS IRVING KAPLANSKY SHIZUO KAKUTANI HANS SAMELSON

#### WITH THE COÖPERATION OF

RAOUL BOTT EDWIN HEWITT WALTER RUDIN R. H. BRUCK JACOB KOREVAAR R. M. THRALL JOHN WERMER PAUL CIVIN R. V. KADISON I. M. SINGER

VOLUME 8, NUMBER 1 FEBRUARY, 1957

PUBLISHED BY THE SOCIETY MENASHA, WIS., AND PROVIDENCE, R. I.

#### **Journals Published by the**

### **American Mathematical Society**

#### Bulletin of the American Mathematical Society

This journal is the official organ of the Society. It reports official acts of the Society and the details of its meetings, with abstracts of all research papers presented. It contains some of the officially invited addresses presented before the Society. It contains also announcements and notes on matters of current interest, and reviews of ad-vanced mathematical books.

One volume of six numbers is planned for 1957. The subscription price is \$7.00. The prices of back volumes, insofar as they are available, are as follows: vols. 1-36 (1894–1930), \$7.00 each; vols. 37–53 (1931–1947), \$9.00 each; vols. 54–55 (1948–1949), \$11.00 each; vols. 56–62 (1950–1956), \$7.00 each.

#### Proceedings of the American Mathematical Society

This journal is devoted entirely to research in pure and applied mathematics, and is devoted principally to the publication of original papers of moderate length. Volume 1 appeared in 1950.

Articles for insertion in the PROCEEDINGS should be typewritten, double spaced, and the manuscript should not exceed 12 pages. The greatest possible care should be taken in preparing the manuscript and if necessary The Manual for Authors pub-lished by the Society should be consulted. The authors should keep a complete copy.

Inshed by the Society should be consulted. The authors should keep a complete copy. Papers in algebra, number theory, logic and foundations should be sent to IRVING KAPLANSKY, Fine Hall, Princeton, New Jersey (until June 1, 1957; thereafter to Eckhart Hall, University of Chicago, Chicago 37, Ill.); in geometry and topology to HANS SAMELSON, Department of Mathematics, University of Michigan, Ann Arbor, Mich.; in probability, real variables and abstract analysis to SHIZUO KAKUTANI, Leet Oliver Memorial Hall, Yale University, New Haven 11, Conn.; in other branches of analysis, applied mathematics, and all other fields to R. P. Boas, Lunt Building, Northwestern University, Evanston III, All other communications to the editors Northwestern University, Evanston, III. All other communications to the editors should be addressed to the Managing Editor, R. P. BOAS. One volume of six numbers is planned for 1957. The subscription price is \$11.00.

Vols. 1-7 (1950-1956) are available at the price of \$11.00 each.

#### Transactions of the American Mathematical Society

This journal is devoted entirely to research in pure and applied mathematics, and includes in general longer memoirs than the PROCEEDINGS.

Three volumes of two numbers each will be published in 1957. The price per volume 11 the volumes of two numbers each will be published in 1957. The price per volume is \$8.00. Volumes 1-36 (1900–1934) consist of four numbers each. Volumes 66–67 (1949) and 78–82 (1955–1956) consist of two numbers each. All other volumes consist of three numbers each. The prices of back volumes, insofar as they are available, are as follows: vols. 1–21 (1900–1920), \$7.00 each; vols. 22–32 (1921–1930), \$8.00 each; vols. 33–36 (1931–1934), \$9.00 each; vols. 37–83 (1935–1956), \$6.00 each.

#### Mathematical Reviews

This journal contains abstracts and reviews of the current mathematical literature of the world. It is sponsored by thirteen mathematical organizations, located both in the United States and abroad.

The publication of MATHEMATICAL REVIEWS was begun in 1940. It appears monthly, excepting July, and the price per annual volume is \$35.00. Orders for com-plete volumes only are accepted. Volumes 1-17 (1940-1956) are available at \$20.00 per volume.

Copyright, American Mathematical Society, 1957

Printed in the United States of America

The PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY is published bimonthly, in February. April, June, August, October, and December, Price per annual volume is \$11.00. Subscriptions, orders for back numbers, and inquiries in regard to nondelivery of current numbers should be addressed to the American Mathematical Society, 450 Ahnaip Street, Menasha, Wis., or 190 Hope Street, Providence

American Mathematical Society, 450 Annalp Street, Menasha, Wis., or 190 Hope Street, Providence 6, R. I. Entered as second-cass matter at the post office at Menasha, Wisconsin. Authorization is granted under the authority of the act of August 24, 1912, as amended by the act of August 4, 1947 (sec. 34.21, P. L. & R.). Acceptance for mailing at the special rate of postage provided for in section 35.40 paragraph d, P. L. & R.

# PROCEEDINGS

### OF THE

# American Mathematical Society

EDITED BY

R. P. BOAS IRVING KAPLANSKY SHIZUO KAKUTANI HANS SAMELSON

WITH THE COÖPERATION OF

RAOUL BOTT EDWIN HEWITT WALTER RUDIN R. H. BRUCK JACOB KOREVAAR R. M. THRALL JOHN WERMER

PAUL CIVIN R. V. KADISON I. M. SINGER

VOLUME 8 1957

PUBLISHED BY THE SOCIETY MENASHA, WIS., and PROVIDENCE, R. I.

### Books Published by the

## American Mathematical Society

**Colloquium Publications** 

37.	N. Jacobson, Structure of rings, 1956, viii, 263 pp. W. H. Gottschalk and G. A. Hedlund, <b>Topological dynamics</b> , 1955, viii,	\$7.70
35	151 pp. A. C. Schaeffer and D. C. Spencer, Coefficient regions for schlicht func-	5.10
24	tions, 1950, xvi, 311 pp.	6.00
34.	functions, 1950, viii, 384 pp.	6.00
32. 30.	R. L. Wilder, Topology of manifolds, 1949, x, 402 pp. T. Radó, Length and area, 1948, vi, 572 pp.	7.00
29.	A. Weil, Foundations of algebraic geometry, 1946, xx, 288 pp.	5.50
27.	S. Lefschetz, Algebraic topology, 1942; reprinted, 1955, vi, 389 pp. G. Birkhoff Lattice theory, 1940; enlarged and completely revised edi-	4.40
	tion, 1948, xiv, 283 pp.	6.00
24. 20.	J. L. Walsh, Interpolation and approximation by rational functions in	4.00
10.	the complex domain, 1935; revised edition, 1956, x, 398 pp. R. F. A. C. Paley and N. Wiener, Fourier transforms in the complex	7.00
10	domain, 1934; reprinted, 1954 viii, 184 pp. +portrait plate.	4.00
18.	M. Morse, the calculus of variations in the large, 1934; reprinted, 1947, x, 368 pp.	5.35
17.	J. H. M. Wedderburn, Lectures on matrices, 1934; reprinted, 1949, x, 205 pp.	3.35
15.	M. H. Stone, Linear transformations in Hilbert space and their applica-	8 00
11.	D. Jackson, The theory of approximation, 1930, reprinted, 1951, viii, 178	0.00
10.	A. B. Coble, Algebraic geometry and theta functions, 1929; reprinted,	3.35
0.	1947, viii, 282 pp. G. D. Birkhoff, Dynamical systems, 1927: reprinted, 1952, viii, 295 pp.	4.00
52.	O. Veblen, Analysis situs, 1922, 2d ed., 1931, reprinted, 1951, x, 194 pp.	3.35
32.	E. Kasner, Differential-geometric aspects of dynamics, 1913; reprinted, 1947, iv, 117 pp.	2.50
	Mathematical Surveys	
б.	C. Chevalley, Introduction to the theory of algebraic functions of one variable, 1951 vii 188 pp	\$4 00
5.	S. Bergman, The kernel function and conformal mapping, 1950, viii,	4 00
4.	O. F. G. Schilling, The theory of valuations, 1950, viii, 253 pp.	6.00
3.	M. Marden, The geometry of the zeros of a polynomial in a complex variable, 1949, x, 181 pp.	5.00
1.	J. A. Shohat and J. D. Tamarkin, The problem of moments, 1943; re-	3 35
	printed, 1950, xiv, 144 pp.	0.00
2	Proceedings of Symposia in Applied Mathematics	@2 00
1.	Non-linear problems in mechanics of continua, 1949, iv, 219 pp.	5.25

The price to members of the American Mathematical Society is 25% less than list. Volumes which are not listed above are out of print.

### CONTENTS

# Vol. 8, No. 1 FEBRUARY, 1957 Whole No. 43

	Page
Continuous function spaces isometric to Hilbert space. By W. F. DONOG-	4
HUE, JR On infinitely differentiable positive definite functions. By A. DEVINATZ On a series of Rainville involving Legendre polynomials. By B. R.	1 3
BHONSLE. On the coefficients of meromorphic schlicht functions. By Z. NEHARI	10
Note on some gap theorems. By DIETER GAIER	24
tials. By PETER HENRICI.	29 32
Continuous functions on compact spaces without perfect subsets. By WALTER RUDIN.	39
A Schwarz inequality for convex operator functions. By CHANDLER DAVIS.	42
On a generalization of the notion of $H^*$ -algebra. By P. P. SAWOROTNOW On the imbedding of a right complemented algebra into Ambrose's $H^*$ -	49
A boundary layer problem for an elliptic equation in the neighborhood of a singular point. By V. J. MIZEL	56 62
Eigenvalues and functional equations. By RICHARD BELLMAN	68
On the Hilbert matrix. By TOSIO KATO	73
A condition that a normal operator have a closed numerical range. By C. H. MENG.	85
On postulates for general quantum mechanics. By D. B. LOWDENS-	00
An interpolation theorem for sublinear operators on $H_p$ spaces. By GUIDO WEISS.	92
Convolutions with rational kernels. By JEROME BLACKMAN Evaluation of a trigonometric integral. By R. MOHANTY Maximal algebras of continuous functions. By HENRY HELSON and	100 107
FRANK QUIGLEY Existence of maximal ideals in algebras of continuous functions. By HENRY HEI SON and ERANK QUIGLEY	111
Note on sums of four and six squares. By L. CARLITZ.	120 125
A property of ordered rings. By A. A. ALBERT. On uniform distribution and the density of sum sets. By BODO VOLK- MANN	128
The generality of local class field theory. (Generalized local class field theory V). By G. WHAPLES.	137
A note on completely primary rings. By S. J. BRYANT and J. L. ZEMMER Integral representations of cyclic groups of prime order. By IRVING REINER	140 142
Flexible almost alternative algebras. By D. M. MERRIELL.	146
A note on the compositeness of numbers. By A. W. ADDISON Derivations of nilpotent Lie algebras. By J. DIXMIER and W. G. LISTER Characteristic ideals and the structure of Lie algebras. By G. B. SELIG-	151 155
MAN. Regular collineation groups. By D. R. HUGHES.	159 165
cylindric and polyadic algebras. By B. A. GALLER. On <i>H</i> -spaces with two nontrivial homotopy groups. By A. H. COPE-	169 176
LAND, JR Multiplication on spheres (I). By I. M. JAMES.	184 192
Hilbert space. By I. E. SEGAL Some consequences of the approximation theorem of Bing. By O. G.	197
Harrold, Jr	204

GEORGE BANTA COMPANY, INC., MENASHA, WISCONSIN