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 4 AUGUST, 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 advanced mathematical books.

One volume of six numbers is planned for 1957. The subscription price is \$7.00. The prices of back volumes, insofapas they are available, are as follows: vols. 1–27, 29 (1894–1921, 1923) \$23.50 each; vol. 28 (1922) \$19.70; vols. 30–35 (1924–1929) \$20.00 each; vols. 36–55 (1930–1949) \$28.00 each; vols. 56–62 (1950–1956) \$14.00 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,

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 published 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, 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, Ill. All other communications to Lunt Building, Northwestern University, Evanston, Ill. All other communications to the editors should be addressed to the Managing Editor, IRVING KAPLANSKY.

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 \$14.00 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 is \$8.00. Volumes 1-36 (1900-1934) consist of four numbers each. Volumes 66-67 (1949) and 78-84 (1955-1957) 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. 1-36 (1900-1934), \$16.00 each; vols. 37-65, 68-77 (1934-1954) \$12.00 each; vols. 66, 67, 78-84 (1949, 1955-1957) \$8.00 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 complete volumes only are accepted. Volumes 10 and 17 are not available. Volumes 1-9 and 11-16 are available at the following prices: Vols. 1-2 (1940-1941) \$24.00 each; all other volumes \$36.00.

American Mattenantal October American Mattenantal October American Mattenantal Mattenantal Mattenantal Mattenantal Mattenantal 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.

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

Books Published by the

American Mathematical Society

	Colloquium Publications	
37. 36.	N. Jacobson, Structure of rings, 1956, viii, 263 pp. W. H. Gottschalk and G. A. Hedlund, Topological dynamics, 1955, viii,	\$7.70
	151 pp.	5.10
35.	A. C. Schaeffer and D. C. Spencer, Coefficient regions for schlicht functions, 1950, xvi. 311 pp.	6.00
34.	J. L. Walsh, The location of critical points of analytic and harmonic functions, 1950, viii, 384 pp.	6.00
32.	R. L. Wilder, Topology of manifolds, 1949, x, 402 pp.	7.00 6.75
30. 29.	T. Radó, Length and area, 1948, vi, 572 pp. A. Weil, Foundations of algebraic geometry, 1946, xx, 288 pp.	5.50
28.	G. T. Whyburn, Analytic topology, 1942; reprinted, 1955, x, 280 pp.	4.75
27.	S. Lefschetz, Algebraic topology, 1942; reprinted, 1955, vi, 389 pp.	4.40
25.	G. Birkhoff, Lattice theory, 1940; enlarged and completely revised edi-	
	tion, 1948, xiv, 283 pp.	6.00
24.	A. A. Albert, Structure of algebras, 1939; reprinted, 1952, xii, 210 pp.	4.00
20.	J. L. Walsh, Interpolation and approximation by rational functions in the complex domain, 1935; revised edition, 1956, x, 398 pp.	7.00
19.	R. E. A. C. Paley and N. Wiener, Fourier transforms in the complex	
	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,	3.35
15.	205 pp. M. H. Stone, Linear transformations in Hilbert space and their applica-	3.33
10.	tions to analysis, 1932; reprinted, 1951, viii, 622 pp.	8.00
11.	D. Jackson, The theory of approximation, 1930, reprinted, 1951, viii,	
	178 pp.	3.35
10.	A. B. Coble, Algebraic geometry and theta functions, 1929; reprinted,	4.00
9.	1947, viii, 282 pp. G. D. Birkhoff, Dynamical systems, 1927; reprinted, 1952, viii, 295 pp.	4.60
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	
6.	C. Chevalley, Introduction to the theory of algebraic functions of one	
	variable, 1951, xii, 188 pp.	\$4.00
5.	S. Bergman, The kernel function and conformal mapping, 1950, viii,	4 00
4	161 pp.	4.00
4.	O. F. G. Schilling, The theory of valuations, 1950, viii, 253 pp. M. Marden, The geometry of the zeros of a polynomial in a complex	6.00
0.	variable, 1949, x, 181 pp.	5.00
1.	J. A. Shohat and J. D. Tamarkin, The problem of moments, 1943; re-	
	printed, 1950, xiv, 144 pp.	3.35
	Proceedings of Symposia in Applied Mathematics	
2.	Electromagnetic theory, 1950, iv, 91 pp.	\$3.00
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.

	Page
Theorems on compact totally disconnected semigroups and lattices. By	
KATSUMI NUMAKURA	623
On the power of a prime dividing the order of a group of automor-	
phisms. By J. E. Adney	627
A note on finite unions of ideals and subgroups. By N. H. McCoy	633
Notes on a paper by Sanov. By R. R. STRUIK	638
Commutative subdirectly irreducible rings. By NATHAN DIVINSKY A generalization of Hilbert's Nullstellensatz. By S. A. AMITSUR	649
A note on the Stone-Weierstrass theorem for quaternions. By J. C.	049
HOLLADAY	656
On regular group rings. By MAURICE AUSLANDER	658
A characterization of some metacyclic groups. By Eugene Schenkman	664
Jordan homomorphisms and right alternative rings. By M. F. SMILEY.	668
On an axiom of Bourbaki. By Oswald Wyler	672
On a class of lattice-ordered rings. By BARRON BRAINERD	673
Compactness of the structure space of a ring. By M. Schreiber	684
The nonexistence of a certain type of simple groups of odd order. By	
Michio Suzuki	686
Note on a theorem of Schreier. By A. KARRASS and D. SOLITAR	696
Notes on linearly compact algebras. By TI YEN	698
On the zeroes of the derivatives of an entire function. By A. Edrei	
and G. R. MacLane	702
An elementary proof of the closure in L of translations of e^{-x} , and the	700
Borel Tauberian theorem, By H. R. PITT	706
Remarks on a matrix transformation for linear differential equations.	708
By W. T. Reid	100
mensional. By Paul Koosis	712
A property of Hurwitz polynomials and some associated inequalities for	.12
Fourier transforms. By A. H. ZEMANIAN	716
A note on the span of translations in L^p . By C. S. Herz	724
The spectra of bounded linear operators on the sequence spaces. By	
C. J. A. Halberg, Jr	728
On the normality of an analytic operator. By John Butler	733
On a theorem of Magnus. By Edwin Hewitt and E. P. Wigner	740
On canonical constructions IV. By Murray Gerstenhaber	745
Fixed points for certain noncontinuous transformations. By O. H.	
Hamilton	750
A new sufficient condition for periodic solutions of weakly nonlinear	
differential systems. By L. CESARI and J. K. HALE	757
On quasi-orthogonal polynomials. By T. S. CHIHARA	765
On square roots of normal operators. By C. R. PUTNAM	768
On <i>n</i> -metacaloric functions. By AVNER FRIEDMAN On closed convex surfaces. By V. G. GROVE	770
On Poincaré's last geometrical theorem. By Shlomo Sternberg	787
Convex sets and nearest points. By R. R. Phelps	790
Mobs, trees, and fixed points. By L. E. WARD, JR	798
On the differentiability of isometries. By R. S. Palais	805
Fixed points of symmetric product mappings. C. N. MAXWELL	808
Higher dimensional indecomposable connected sets. By P. M. SWINGLE	816
The ring $C(X, R)$ considered as a subring of the ring of all real-valued	
functions. By L. E. Pursell	820
Another note on paracompact spaces. By E. MICHAEL	822
Compact mappings. By Edwin Halfar	828