

PROCEEDINGS

OF THE

AMERICAN MATHEMATICAL SOCIETY

EDITED BY

R. P. BOAS

P. R. HALMOS

IRVING KAPLANSKY

HANS SAMELSON

WITH THE COÖPERATION OF

RICHARD BELLMAN

FELIX BROWDER

I. N. HERSTEIN

R. V. KADISON

ERWIN KLEINFELD

JACOB KOREVAAR

J. C. MOORE

M. O. READE

I. M. SINGER

JOHN WERMER

VOLUME 10, NUMBER 3

JUNE, 1959

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 details of its meeting. It contains some of the officially invited addresses presented before the Society, research announcements and problems, and reviews of advanced mathematical books.

One volume of six numbers is planned for 1959. The subscription price is \$7.00. The prices of back volumes, insofar as 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. 56-63 (1950-1958), \$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, 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 and number theory should be sent to IRVING KAPLANSKY, Eckhart Hall, University of Chicago, Chicago 37, Ill.; in probability, real variables, logic and foundations to P. R. HALMOS, Eckhart Hall, University of Chicago, Chicago 37, Ill.; in abstract analysis to either P. R. HALMOS or IRVING KAPLANSKY; in geometry and topology to HANS SAMELSON, Department of Mathematics, University of Michigan, Ann Arbor, Mich.; 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 the editors should be addressed to the managing editor, IRVING KAPLANSKY.

One volume of six numbers is planned for 1959. The subscription price is \$11.00. Vols. 1-8 (1950-1958) 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.

Four volumes of three numbers each will be published in 1959. The price per volume is \$8.00. Volumes 1-36 (1900-1934) consist of four numbers each. Volumes 66-67 (1949) and 78-88 (1955-1958) 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, 78-92 (1949, 1955-1959), \$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 \$50.00. Orders for complete volumes only are accepted. Volumes 10 and 17 are not available. Volumes 1-9, 11-16, 18, and 19 are available at the following prices: Vols. 1-14 (1940-1953), \$24.00 each; all other volumes \$50.00.

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, Curtis Reed Plaza, Menasha, Wis., or 190 Hope Street, Providence 6, R. I.

Entered as second-class 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. Second-class postage paid at Menasha, Wisconsin.

Copyright, American Mathematical Society, 1959

Printed in the United States of America

Books Published by the American Mathematical Society

Colloquium Publications

37.	N. Jacobson, <i>Structure of rings</i> , 1956, viii, 263 pp.	\$7.70
36.	W. H. Gottschalk and G. A. Hedlund, <i>Topological dynamics</i> , 1955, viii, 151 pp.	5.10
35.	A. C. Schaeffer and D. C. Spencer, <i>Coefficient regions for schlicht functions</i> , 1950, xvi, 311 pp.	6.00
34.	J. L. Walsh, <i>The location of critical points of analytic and harmonic functions</i> , 1950, viii, 384 pp.	6.00
32.	R. L. Wilder, <i>Topology of manifolds</i> , 1949, x, 402 pp.	7.00
31.	Einar Hille and R. S. Phillips, <i>Functional analysis and semi-groups</i> , 1957; enlarged and revised edition of book of the same title published in 1948 by the first of the two authors, xii, 808 pp.	13.80
30.	T. Radó, <i>Length and area</i> , 1948, vi, 572 pp.	6.75
28.	G. T. Whyburn, <i>Analytic topology</i> , 1942; reprinted, 1955, x, 280 pp.	4.75
27.	S. Lefschetz, <i>Algebraic topology</i> , 1942; reprinted, 1955, vi, 389 pp.	4.40
24.	A. A. Albert, <i>Structure of algebras</i> , 1939; reprinted, 1952, xii, 210 pp.	4.00
20.	J. L. Walsh, <i>Interpolation and approximation by rational functions in the complex domain</i> , 1935; revised edition, 1956, x, 398 pp.	7.00
18.	M. Morse, <i>The calculus of variations in the large</i> , 1934; reprinted, 1947, x, 368 pp.	5.35
17.	J. H. M. Wedderburn, <i>Lectures on matrices</i> , 1934; reprinted, 1949, x, 205 pp.	3.35
15.	M. H. Stone, <i>Linear transformations in Hilbert space and their applications to analysis</i> , 1932; reprinted, 1958, viii, 622 pp.	8.00
11.	D. Jackson, <i>The theory of approximation</i> , 1930, reprinted, 1951, viii, 178 pp.	3.70
10.	A. B. Coble, <i>Algebraic geometry and theta functions</i> , 1929; reprinted, 1947, viii, 282 pp.	4.00
8.	L. P. Eisenhart, <i>Non-Riemannian geometry</i> , 1927; reprinted 1958, xiii + 184 pp.	4.90

Mathematical Surveys

6.	C. Chevalley, <i>Introduction to the theory of algebraic functions of one variable</i> , 1951, xii, 188 pp.	\$4.00
5.	S. Bergman, <i>The kernel function and conformal mapping</i> , 1950, viii, 161 pp.	4.00
4.	O. F. G. Schilling, <i>The theory of valuations</i> , 1950, viii, 253 pp.	6.00
3.	M. Marden, <i>The geometry of the zeros of a polynomial in a complex variable</i> , 1949, x, 181 pp.	5.00
1.	J. A. Shohat and J. D. Tamarkin, <i>The problem of moments</i> , 1943; reprinted, 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.

CONTENTS

Vol. 10, No. 3

JUNE, 1959

Whole No. 57

	Page
On contiguous congruent sets in Euclidean space. By C. J. A. HALBERG, JR., EUGENE LEVIN, and E. G. STRAUS.....	335
Each homogeneous nondegenerate chainable continuum is a pseudo-arc. By R. H. BING.....	345
A plane continuum no two of whose nondegenerate subcontinua are homeomorphic: An application of inverse limits. By R. D. ANDERSON and GUSTAVE CHOQUET.....	347
On the construction of periodic maps without fixed points. By P. E. CONNER and E. E. FLOYD.....	354
Metrisability of unions of spaces. By A. H. STONE.....	361
Correspondance entre deux surfaces par des faisceaux de tangentes parallèles. By P. DRĂGILĂ.....	366
On phi-families. By C. E. WATTS.....	369
Test spaces for metric spaces. By B. H. McCANDLESS.....	372
Compactifications of dimension zero. By L. J. HEIDER.....	377
Certain operators and Fourier transforms on L^2 . By R. R. GOLDBERG.....	385
On the zeros of infrapolynomials for partly arbitrary point sets. By MORRIS MARDEN.....	391
Comment on a paper of C. Uluçay. By W. T. SCOTT.....	395
A note on periodic solutions of second order differential equations without damping. By GEORGE SEIFERT.....	396
A complete orthonormal system of homogeneous polynomials on matrix spaces of order 2. By JOSEPHINE MITCHELL.....	399
On a generalization of an inequality of L. V. Kantorovich. By WERNER GREUB and WERNER RHEINBOLDT.....	407
On a problem of Lohwater. By G. PIRANIAN.....	415
Notes on orthogonal polynomials in two variables. By HEINRICH LARCHER.....	417
A counter-example to a statement on conformal mapping of Riemann surfaces. By J. A. JENKINS.....	423
Almost periodic solutions of second order nonlinear differential equations with almost periodic forcing. By C. E. LANGENHOP and G. SEIFERT.....	425
On some composition formulas. By J. HORVÁTH.....	433
Entire operators and functional equations. By Z. A. MELZAK.....	438
Proximity maps for convex sets. By WARD CHENEY and A. A. GOLDSTEIN.....	448
The representation of integers by three positive squares. By E. GROSSWALD, A. CALLOWAY and J. CALLOWAY.....	451
Simplicity of near-rings of transformations. By GERALD BERMAN and R. J. SILVERMAN.....	456
On a question of Paul Lévy. By R. V. CHACON.....	460
Remarks on the commutativity of rings. By M. F. SMILEY.....	466
Characteristic functionals. By R. J. SILVERMAN and TI YEN.....	471
Quasi-nil rings. By ERWIN KLEINFELD.....	477
On bounded functions with bounded n th differences. HASSLER WHITNEY.....	480
A question concerning positive type polynomials. By HENRY TEICHER.....	482
On ramified complete discrete valuation rings. By NICKOLAS HEEREMA.....	490
The analysis of the characters of the Lie representations of the general linear group. By H. O. FOULKES.....	497
Some relationships involving subordination. By R. M. BLUMENTHAL.....	502