

PROCEEDINGS
OF THE
AMERICAN MATHEMATICAL SOCIETY

EDITED BY

R. P. BOAS

P. R. HALMOS

ALEX ROSENBERG

HANS SAMELSON

WITH THE COÖPERATION OF

RICHARD BELLMAN

FELIX BROWDER

E. E. FLOYD

I. N. HERSTEIN

ERWIN KLEINFELD

J. C. MOORE

M. O. READE

DANA SCOTT

A. H. TAUB

DANIEL ZELINSKY

VOLUME 11, NUMBER 2

APRIL, 1960

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 meetings. 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 1960. 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. 56-64 (1950-1959), \$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 ALEX ROSENBERG, Lunt Building, Northwestern University, Evanston, Illinois; in probability, real variables, logic, and foundations to P. R. HALMOS, Eckhart Hall, University of Chicago, Chicago 37, Illinois; in abstract analysis to either P. R. HALMOS or ALEX ROSENBERG; in geometry and topology to HANS SAMELSON, Department of Mathematics, University of Michigan, Ann Arbor, Michigan; in other branches of analysis, applied mathematics, and all other fields to R. P. BOAS, Lunt Building, Northwestern University, Evanston, Illinois. All other communications to the editors should be addressed to the Managing Editor, P. R. HALMOS.

One volume of six numbers is planned for 1960. The subscription price is \$11.00. Vols. 1-10 (1950-1959) 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 1960. 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, 78-93 (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.

Second-class postage paid 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.

Copyright©, American Mathematical Society, 1960

Printed in the United States of America

Journals Published by the American Mathematical Society

Soviet Mathematics—Doklady

This journal contains the entire pure mathematics section of the DOKLADY AKADEMII NAUK SSSR in translation. It appears six times a year, each bimonthly issue corresponding to one volume of the Soviet DOKLADY. (The DOKLADY AKADEMII NAUK SSSR is issued three times a month, six issues constituting a volume.)

Rates per annual volume are as follows: Domestic subscriptions, \$17.50; foreign subscriptions, \$20.00. Single issues are \$5.00.

Notices of the American Mathematical Society

This journal announces the programs of the meetings of the Society. It carries the abstracts of all contributed papers presented at the meetings of the Society and publishes news items of interest to mathematical scientists.

The subscription price is \$7.00 per annual volume of 7 numbers. A single copy is \$2.00.

All communications should be addressed to the Editor, G. L. WALKER, 190 Hope Street, Providence 6, R. I. News items and insertions for each issue must be in the hands of the editor on or before the deadline for the abstracts of the papers to be presented in the meetings announced in that issue. These deadlines are published regularly on the inside front cover page.

Memoirs of the American Mathematical Society

This is a series of paperbound research tracts which are of the same general character as papers published in the TRANSACTIONS. An issue contains either a single monograph or a group of cognate papers. Published at irregular intervals. The latest numbers in this series are:

- | | |
|--|------|
| 33. Ernst Snapper, <i>Cohomology theory and algebraic correspondences</i> . 96 pp. 1959. | 1.90 |
| 34. E. M. Zaustinsky, <i>Spaces with non-symmetric distance</i> . 91 pp. 1959. | 2.00 |
| 35. Richard Bellman and K. L. Cooke, <i>Asymptotic behavior of solutions of differential-difference equations</i> . 91 pp. 1959. | 2.00 |
| 36. Richard S. Palais, <i>The classification of G-spaces</i> . 72 pp. To be published in May, 1960. | 1.65 |
-

CONTENTS

Vol. 11, No. 2

APRIL, 1960

Whole No. 62

	Page
Homogeneous games. II. By J. R. ISBELL.....	159
On induced topologies in quasi-reflexive Banach spaces. By L. C. HUNTER.....	161
Arithmetical functions of a greatest common divisor. I. By ECKFORD COHEN.....	164
Isotopy in 3-manifolds. III. Connectivity of spaces of homeomorphisms. By D. E. SANDERSON.....	171
On the Nachbin uniform structure. By NELSON ONUCHIC.....	177
Prime rings satisfying a polynomial identity. By E. C. POSNER.....	180
A theorem on general recursive functions. By S.-C. LIU.....	184
Derivations and embeddings of a field in its power series ring. By NICKOLAS HEEREMA.....	188
On the algebraic hull of a Lie algebra. By G. HOCHSCHILD.....	195
Semi-complete primary abelian groups. By GEORGE KOLETTIS, JR....	200
A matrix inequality. By H. O. CORDES.....	206
Basic sequences in the space of measurable functions. By CASPER GOFFMAN and DANIEL WATERMAN.....	211
On the structure of certain factorizable groups. II. By DANIEL GORENSTEIN and I. N. HERSTEIN.....	214
On "An identity in arithmetic." By GERARD DEBREU.....	220
The axiom of choice for finite sets. By R. L. BLAIR and M. L. TOMBER.	222
The isolated points in the dual of a commutative semi-group. By W. W. COMFORT.....	227
Hausdorff interval topology on a partially ordered set. By YATARŌ MATSUSHIMA.....	233
A sufficient condition that a mapping of Riemannian manifolds be a fibre bundle. By ROBERT HERMANN.....	236
The existence of widely connected and biconnected semigroups. By P. M. SWINGLE.....	243
Widely connected and biconnected semigroups. By P. M. SWINGLE..	249
Sur un système de couples de réseaux parallèles. By PAVEL DRÄGILÄ..	255
The isoperimetric problem of the convex hull of a closed space curve. By Z. A. MELZAK.....	265
Extending diffeomorphisms. By R. S. PALAIS.....	274
Univalence of Bessel functions. By R. K. BROWN.....	278
On the Gibbs phenomenon for harmonic means. By F. C. HSIANG...	284
A new class of integral transforms. By TA LI.....	290
Remarks on Cauchy's integral formula in matric spaces. By JOSEPHINE MITCHELL.....	299
A countable interpolation problem. By Z. A. MELZAK.....	304
On Borel's method of summability. By W. MEYER-KÖNIG and K. ZELLER.....	307
Some special transformation groups. By IRVING GLICKSBERG.....	315
A conjecture of R. Nevanlinna concerning the genus of a meromorphic function. By ALBERT EDREI and S. M. SHAH.....	319
An infinite packing theorem for spheres. By OSCAR WESLER.....	324
A generalization of the theorem of Sylvester. By FRITZ HERZOG and L. M. KELLY.....	327
Dissimilarity characteristic theorems for graphs. FRANK HARARY and R. Z. NORMAN.....	332