PROCEEDINGS

OF THE

AMERICAN MATHEMATICAL SOCIETY

EDITED BY

FRED G. BRAUER W. H. J. FUCHS IRVING GLICKSBERG IRVING REINER

ARTHUR MATTUCK ERNEST A. MICHAEL P. EMERY THOMAS

WITH THE COÖPERATION OF

W. W. BOONE JOSHUA CHOVER

S. M. SHAH HANS WEINBERGER

VOLUME 23, NUMBER 2 NOVEMBER, 1969

PUBLISHED BY THE AMERICAN MATHEMATICAL SOCIETY PROVIDENCE, RHODE ISLAND

Proceedings of the American Mathematical Society

The PROCEEDINGS of the American Mathematical Society is devoted entirely to research in pure and applied mathematics, and the publication of original papers of moderate length. Articles for insertion should be typewritten and double spaced. Ditto is not generally satisfactory, although other modes of multiple reproduction may be. The maximum length of an acceptable paper is about 8 printed pages. (Since a page of the PROCEEDINGS contains about 400 words, a rule of thumb is that under 10 typed pages is probably within the limit, but that over 12 typed pages is probably too long.) The *Manual for Authors*, available from the Society, should be consulted for symbols and style conventions. Authors should take the greatest possible care in preparing the original manuscript. Hand drawn symbols are satisfactory, if clearly done; directions to the printer should be included where necessary on a separate sheet, not in the accompanying letter. Authors must keep a complete copy of their manuscript, and editors will acknowledge receipt; manuscripts can therefore be sent by ordinary mail and any other kind (registered, certified) is entirely unnecessary.

The first page should consist of a *descriptive title*, followed by an *abstract* which summarizes the article in language suitable for workers in the general field (algebra, analysis, etc.). It should be at least one complete sentence, but not over 150 words, with the upper limit primarily for longer papers. The title should be short, but informative; useless or vague phrases such as "some remarks about" or "concerning" should be avoided. At the end of the article, placed before the first footnote, there should be first the A.M.S. *subject classification numbers* representing the primary and secondary subjects of the article, followed by a list of *key words* and *phrases* describing the subject matter of the article and taken from it. A list of subject classification numbers is printed at the end of each volume of Mathematical Reviews. See the June 1969 Notices for more details, as well as illustrative examples.

Very short notes (not to exceed 1 printed page) of an unusual nature are also accepted, and appear under the heading SHORTER NOTES. (Items deemed suitable include an elegant new proof of an important and well-known theorem, an illuminating example of counterexample, or a new viewpoint on familiar results. New results, if of a brief and striking character, might also be acceptable, though in general a paper which is merely very short will not be suitable for the SHORTER NOTES department.)

Papers in algebra and number theory should be sent to ARTHUR MATTUCK, Room 2-275, Mathematics Department, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, or to IRVING REINER, Mathematics Department, University of Illinois, Urbana, Illinois 61801.

Papers in modern or classical analysis should be sent to IRVING GLICKSBERG, Mathematics Department, University of Washington, Seattle, Washington 98105, or to W. H. J. FUCHS, White Hall, Cornell University, Ithaca, New York 14850.

Papers in algebraic geometry should be sent to ARTHUR MATTUCK; papers in set-theoretic and general topology to ERNEST MICHAEL, Mathematics Department, University of Washington, Seattle, Washington 98105; in algebraic topology and all other types of geometry to P. EMERY THOMAS, Mathematics Department, University of California, Berkeley, California 94720.

Papers in applied mathematics, differential equations, and related areas of analysis should be sent to FRED BRAUER, Mathematics Department, University of Wisconsin, Madison, Wisconsin 53706.

Papers in probability, statistics, and related fields should be sent to JOSHUA CHOVER, Mathematics Department, University of Wisconsin, Madison, Wisconsin 53706.

Papers in logic, set theory, and related areas should be sent to W. W. BOONE, Mathematics Department, University of Illinois, Urbana, Illinois 61801.

All other communications should be addressed to the Managing Editor, ARTHUR MATTUCK, at the above address.

Inquiries from authors regarding reprints, or changes of addresses for mailing proofs, should be sent directly to the Editorial Department, American Mathematical Society, P. O. Box 6248, Providence, Rhode Island 02904.

Four volumes of three issues are planned for 1969. The subscription price is \$80.00 for the four volumes. Back issues of Volumes 1–16 are available at a price of \$14.00 each and Volumes 17–21 at a price of \$18.00 each.

Copyright (), American Mathematical Society, 1969 Printed in the United States of America

The PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY is published monthly. Subscriptions, orders for back numbers, and inquiries in regard to nondelivery of current numbers should be addressed to the American Mathematical Society, 321 S. Main St., P. O. Box 6248, Providence, R. I. 02904. Second-class postage paid at Providence, Rhode Island and additional mailing offices.

Contents—Continued from back cover

An asymptotic property of solutions of wave equations. By JEROME A. GOLDSTEIN.	359
A theorem of Aliev. By A. C. PETERSON	364
The strong-bounded topology on groups of automorphisms of a von	
Neumann algebra. By ROBERT R. KALLMAN	367
Integral representation of multiplicative, involution preserving oper- ators in $\mathcal{L}(C(S), E)$. By GERALD W. JOHNSON	373
On some subspaces of Banach spaces whose duals are L_1 spaces. By	
M. ZIPPIN	378
Elements of a normed algebra whose 2^n th powers lie close to the iden-	
tity. By PAUL R. CHERNOFF.	386
A generalized Paley-Wiener-Zygmund integral and its applications.	200
By Chull Park.	388
Convergence of a sequence of powers. By R. E. DEMARR	401
Subalgebras of group algebras. By ROGER RIGELHOF	404
On measures with separable orbit. By K. W. TAM	409
Product solutions for simple games. III. By T. PARTHASARTHY	412
On the substitution problem for free groups. By PAUL E. SCHUPP	421
Transcendental numbers with badly distributed powers. By DAVID W.	424
BoyD	424 428
A summable C_{Ω} -group. By PAUL HILL.	428
A note on injective group rings. By ENZO R. GENTILE Extensions of torsionfree groups by torsion groups. By HERMANN	431
	433
SIMON On the convolution of logarithmically concave sequences. By K. V.	400
MENON.	439
Endomorphism rings of ideals in a commutative regular ring. By	107
Roger Wiegand	442
A note on the representation of a solution of an elliptic differential	
equation near an isolated singularity. By DAVID G. SCHAEFFER	450

SHORTER NOTES

Binary	relatio	ons on	sets c	of regu	lar care	linality.	By	A.]	R. 1	Bedi	JARJ	EK	
and	T. P. \	NHALE	EY										455
The ta	ngent	bundle	of the	long l	ine. By	JAMES	A. 1	IORI	ROM	7			458

GEORGE BANTA COMPANY, INC., MENASHA, WISCONSIN

CONTENTS

Vol. 23, No. 2

NOVEMBER, 1969

Whole No. 125

	rage
Unknotting in codimension one. By L. S. HUSCH	215
BRANT.	220
Concerning suspension spheres. By RONALD H. ROSEN	225
Transverse field implies normal microbundle. By H. PUTZ	232
Homogeneous almost tangent structures. By M. P. CLoss	237
A separation theorem for manifolds. By Russell G. BRASHER	242
	242
Some theorems on the real pencil and simultaneous diagonalization of	046
two Hermitian bilinear functions. By YIK-HOI AU-YEUNG	246
The set of nonprincipal orbits of an action on E^n . By GLEN E. BREDON A note on δ -continuity and proximate fixed points for multi-valued	254
functions. By RAYMOND E. SMITHSON	256
Point-transitive actions by a standard metric thread. By J. T.	
Borrego	261
Noncut points and modified compactness conditions. By R. M.	
STEPHENSON, JR.	266
A note on Z-mappings and WZ-mappings. By PHILLIP ZENOR	273
Embedding a transformation group in an automorphism group. By	
MURRAY EISENBERG	276
Monotone noncompact mappings of E^r onto E^k for $r \ge 4$ and $k \ge 3$. By	
L. C. GLASER	282
Tameness implied by extending a homeomorphism to a point. By	202
L. D. LOVELAND.	287
A note on stratifiable spaces. By R. A. STOLTENBERG.	294
Compactification of mappings. By George L. CAIN, JR	294
Commutative rims in clans with zero. By EDWARD N. FERGUSON	304
Mean convergence of Jacobi series. By BENJAMIN MUCKENHOUPT	306
Symbolic calculus for algebras of Fourier-Stieltjes transforms. By	~ ~ ~ ~
Colin C. Graham	311
A characterization of totally regular $[J, f(x)]$ transforms. By DANY	
LEVIATAN and LEE LORCH	315
On the convergence of a sequence of Perron integrals. By MANOUG N.	
Manougian	320
The set of curvilinear convergence of a continuous function defined in	
the interior of a cube. By T. J. KACZYNSKI	323
Strong ergodic theorems for Markov processes. By S. HOROWITZ	328
Properties of two point boundary value functions. By G. A. BOGAR	335
Bounded solutions of some abstract differential equations. By S.	
ZAIDMAN	340
On a theorem of Pokornyi. By W. J. KIM.	343
Symmetric operators with twice continuously differentiable spectral	
functions. By RICHARD C. GILBERT Inequalities for the eigenvalues of powers of functions. By DALLAS O.	347
BANKS	356

Continued on inside back cover