

**Pacific  
Journal of  
Mathematics**

VOLUME LXXII

1977

# PACIFIC JOURNAL OF MATHEMATICS

## EDITORS

**RICHARD ARENS** (Managing Editor)  
University of California  
Los Angeles, California 90024

**C. W. CURTIS**  
University of Oregon  
Eugene, OR 97403

**C. C. MOORE**  
University of California  
Berkeley, CA 94720

**J. DUGUNDJI**  
Department of Mathematics  
University of Southern California  
Los Angeles, California 90007

**R. FINN AND J. MILGRAM**  
Stanford University  
Stanford, California 94305

## ASSOCIATE EDITORS

**E. F. BECKENBACH**

**B. H. NEUMANN**

**F. WOLF**

**K. YOSHIDA**

## SUPPORTING INSTITUTIONS

**UNIVERSITY OF BRITISH COLUMBIA**  
**CALIFORNIA INSTITUTE OF TECHNOLOGY**  
**UNIVERSITY OF CALIFORNIA**  
**MONTANA STATE UNIVERSITY**  
**UNIVERSITY OF NEVADA, RENO**  
**NEW MEXICO STATE UNIVERSITY**  
**OREGON STATE UNIVERSITY**  
**UNIVERSITY OF OREGON**  
**OSAKA UNIVERSITY**

**UNIVERSITY OF SOUTHERN CALIFORNIA**  
**STANFORD UNIVERSITY**  
**UNIVERSITY OF TOKYO**  
**UNIVERSITY OF UTAH**  
**WASHINGTON STATE UNIVERSITY**  
**UNIVERSITY OF WASHINGTON**  
\* \* \*  
**AMERICAN MATHEMATICAL SOCIETY**  
**NAVAL WEAPONS CENTER**

## CONTENTS

G. E. Andrews, <i>Plane partition (II): The equivalence of the Bender-Knuth and MacMahon conjectures</i> . . . . .	283
K. Anzai and S. Ishikawa, <i>On common fixed points for several continuous affine mappings</i> . . . . .	1
L. Badger, <i>An Ehrenfeucht game for the multivariable quantifiers of Malitz and some applications</i> . . . . .	293
B. A. Barnes, <i>When is a representation of a Banach *-algebra Naimark-related to a *-representations?</i> . . . . .	5
W. C. Bell, <i>A decomposition of additive set functions</i> . . . . .	305
B. E. Blackadar, <i>Infinite tensor products of C*-algebras</i> . . . . .	313
A. Brøndsted, <i>The inner aperture of a convex set</i> . . . . .	335
N. Burgoyne, <i>Finite groups with Chevalley-type components</i> . . . . .	341
R. D. Byrd, J. T. Lloyd, F. D. Pedersen and J. W. Stepp, <i>Automorphisms of the semigroup of finite complexes of a periodic locally cyclic group</i> . . . . .	27
R. D. Byrd, T. J. Lloyd and R. A. Mena, <i>On the retractability of some one-relator groups</i> . . . . .	351
P. R. Chernoff, <i>Schrödinger and Dirac operators with singular potentials and hyperbolic equations</i> . . . . .	361
D. Coram and P. Duvall, <i>Approximate fibrations and a movability condition for maps</i> . . . . .	41
K. R. Davidson and C. K. Fong, <i>An operator algebra which is not closed in the Calkin algebra</i> . . . . .	57
P. Duvall, See D. Coram and P. Duvall	
G. J. Etgen and J. F. Pawloski, <i>A comparison theorem and oscillation criteria for second order differential systems</i> . . . . .	59
C. K. Fong, See K. R. Davidson and C. K. Fong	
J. J. F. Fournier, <i>Sharpness in Young's inequality for convolution</i> . . . . .	383
S. P. Franklin and B. V. Smith Thomas, <i>On the metrizability of <math>k_\omega</math>-spaces</i> . . . . .	399
D. A. Gay, A. McDaniel and W. Yslas Vélez, <i>Partially normal radical extensions of the rationals</i> . . . . .	403
J.-J. Gervais, <i>Sufficiency of jets</i> . . . . .	419
K. R. Goodearl, <i>Completions of regular rings II</i> . . . . .	423
S. J. Gottlieb, <i>Algebraic automorphisms of algebraic group with stable maximal tori</i> . . . . .	461
P. Green, <i>C*-Algebras of transformation groups with smooth orbit space</i> . . . . .	71
S. Ishikawa, See K. Anzai and S. Ishikawa	
D. G. James, <i>Invariant submodules of unimodular hermitian forms</i> . . . . .	471

- C. A. Jones and C. D. Lahr, *Weak and norm approximate identities are different* . . . . . 99
- G. K. Kalisch, *On integral representations of piecewise holomorphic functions* . . . . . 105
- Y. Kodama, *On product of shape and a question of Sher* . . . 115
- J. Kyle,  *$W\delta(T)$  is convex* . . . . . 483
- C. D. Lahr, See C. A. Jones and C. D. Lahr
- H. Langer and B. Textorius, *On generalized resolvents and  $Q$ -functions of symmetric linear relations (subspaces) in Hilbert space* . . . . . 135
- A. E. Livingston, *On the integral means of univalent, meromorphic functions* . . . . . 167
- J. T. Lloyd, See R. D. Byrd, J. T. Lloyd, F. D. Pedersen and J. W. Stepp
- J. T. Lloyd, See R. D. Byrd, J. T. Lloyd and R. A. Mena
- W. S. Martindale, III and S. Montgomery, *Fixed elements of Jordan automorphisms of associative rings* . . . . . 181
- A. McDaniel, See D. A. Gay, A. McDaniel and W. Yslas Vélez
- R. A. Mena, See R. D. Byrd, J. T. Lloyd and R. A. Mena
- E. Michael and M. E. Rudin, *A note on Eberlein compacts* . . . 487
- E. Michael and M. E. Rudin, *Another note on Eberlein compacts* . 497
- S. Montgomery, See W. S. Martindale, III and S. Montgomery
- T. B. Muenzenberger and R. E. Smithson, *Fixed point theorems for acyclic and dendritic spaces* . . . . . 501
- R. K. Nagle, *Monotonicity and alternative methods for nonlinear boundary value problems* . . . . . 197
- B. S. Nashier and A. R. Rajwade, *Determination of a unique solution of the quadratic partition for primes  $p \equiv 1 \pmod{7}$*  . 513
- R. J. O'Malley, *Approximately differentiable functions: The  $r$  topology* . . . . . 207
- J. F. Pawloski, See G. J. Etgen and J. F. Pawloski
- F. D. Pedersen, See R. D. Byrd, J. T. Lloyd, F. D. Pedersen and J. W. Stepp
- A. R. Rajwade, See B. S. Nashier and A. R. Rajwade
- M. B. Rege and K. Varadarajan, *Chain conditions and pure-exactness* . . . . . 223
- M. E. Rudin, See E. Michael and M. E. Rudin
- M. E. Rudin, See E. Michael and M. E. Rudin
- F. J. Scott, *New partial asymptotic stability results for nonlinear ordinary differential equations* . . . . . 523
- F. Servedio, *Affine open orbits, reductive isotropy groups, and dominant gradient morphisms; a theorem of Mikio Sato* . 537
- C. Shannon, *The second dual of  $C(X)$*  . . . . . 237
- R. E. Smithson, See T. B. Muenzenberger and R. E. Smithson

- B. V. Smith Thomas, See S. P. Franklin and B. V. Smith  
Thomas
- J. W. Stepp, See R. D. Byrd, J. T. Lloyd, F. D. Pedersen and  
J. W. Stepp
- D. Suryanarayana, *On the distribution of some generalized  
square-full integers* . . . . . 547
- S. Takahasi, *A characterization for compact central double  
centralizers on  $C^*$ -algebras* . . . . . 255
- B. Textorius, See H. Langer and B. Textorius
- K. Varadarajan, See M. B. Rege and K. Varadarajan
- T. P. Vaughan, *A note on the Jacobi-Perron algorithm* . . . . 261
- W. Yslas Vélez, See D. A. Gay, A. McDaniel and W. Yslas Vélez
- W. von Wahl, *Instationary Navier-Stokes equations and parabolic  
systems* . . . . . 557
- A. Yanushka, *A characterization of  $PSp(2m, q)$  and  $P\Omega(2m+1, q)$   
as rank 3 permutation groups* . . . . . 273



# Pacific Journal of Mathematics

K. Anzai and S. Ishikawa, <i>On common fixed points for several continuous affine mappings</i> .....	1
B. A. Barnes, <i>When is a representation of a Banach *-algebra Naimark-related to a *-representation?</i> .....	5
R. D. Byrd, J. T. Lloyd, F. D. Pedersen and J. W. Stepp, <i>Automorphisms of the semigroup of finite complexes of a periodic locally cyclic group</i> .....	27
D. Coram and P. Duvall, <i>Approximate fibrations and a movability condition for maps</i> .....	41
K. R. Davidson and C. K. Fong, <i>An operator algebra which is not closed in the Calkin algebra</i> .....	57
G. J. Etgen and J. F. Pawloski, <i>A comparison theorem and oscillation criteria for second order differential systems</i> .....	59
P. Green, <i>C*-Algebras of transformation groups with smooth orbit space</i> .....	71
C. A. Jones and C. D. Lahr, <i>Weak and norm approximate identities are different</i> .....	99
G. K. Kalisch, <i>On integral representations of piecewise holomorphic functions</i> .....	105
Y. Kodama, <i>On product of shape and a question of Sher</i> .....	115
H. Langer and B. Textorius, <i>On generalized resolvents and Q-functions of symmetric linear relations (subspaces) in Hilbert space</i> .....	135
A. E. Livingston, <i>On the integral means of univalent, meromorphic functions</i> .....	167
W. S. Martindale, III and S. Montgomery, <i>Fixed elements of Jordan automorphisms of associative rings</i> .....	181
R. K. Nagle, <i>Monotonicity and alternative methods for nonlinear boundary value problems</i> .....	197
R. J. O'Malley, <i>Approximately differentiable functions: The <math>r</math> topology</i> .....	207
M. B. Rege and K. Varadarajan, <i>Chain conditions and pure-exactness</i> ....	223
C. Shannon, <i>The second dual of <math>C(X)</math></i> .....	237
S. Takahasi, <i>A characterization for compact central double centralizers on C*-algebras</i> .....	255
T. P. Vaughan, <i>A note on the Jacobi-Perron algorithm</i> .....	261
A. Yanushka, <i>A characterization of <math>P\text{Sp}(2m, q)</math> and <math>P\Omega(2m + 1, q)</math> as rank 3 permutation groups</i> .....	273

# PACIFIC JOURNAL OF MATHEMATICS

## EDITORS

RICHARD ARENS (Managing Editor)

University of California  
Los Angeles, CA 90024

CHARLES W. CURTIS

University of Oregon  
Eugene, OR 97403

C. C. MOORE

University of California  
Berkeley, CA 94720

J. DUGUNDJI

Department of Mathematics  
University of Southern California  
Los Angeles, CA 90007

R. FINN and J. MILGRAM

Stanford University  
Stanford, CA 94305

## ASSOCIATE EDITORS

E. F. BECKENBACH

B. H. NEUMANN

F. WOLF

K. YOSHIDA

## SUPPORTING INSTITUTIONS

UNIVERSITY OF BRITISH COLUMBIA  
CALIFORNIA INSTITUTE OF TECHNOLOGY  
UNIVERSITY OF CALIFORNIA  
MONTANA STATE UNIVERSITY  
UNIVERSITY OF NEVADA, RENO  
NEW MEXICO STATE UNIVERSITY  
OREGON STATE UNIVERSITY  
UNIVERSITY OF OREGON  
OSAKA UNIVERSITY

UNIVERSITY OF SOUTHERN CALIFORNIA  
STANFORD UNIVERSITY  
UNIVERSITY OF HAWAII  
UNIVERSITY OF TOKYO  
UNIVERSITY OF UTAH  
WASHINGTON STATE UNIVERSITY  
UNIVERSITY OF WASHINGTON  
\* \* \*  
AMERICAN MATHEMATICAL SOCIETY

---

The Supporting Institutions listed above contribute to the cost of publication of this Journal, but they are not owners or publishers and have no responsibility for its content or policies.

---

Mathematical papers intended for publication in the *Pacific Journal of Mathematics* should be in typed form or offset-reproduced, (not dittoed), double spaced with large margins. Please do not use built up fractions in the text of your manuscript. You may however, use them in the displayed equations. Underline Greek letters in red, German in green, and script in blue. The first paragraph or two must be capable of being used separately as a synopsis of the entire paper. Items of the bibliography should not be cited there unless absolutely necessary, in which case they must be identified by author and Journal, rather than by item number. Manuscripts, in triplicate, may be sent to any one of the editors. Please classify according to the scheme of Math. Reviews, Index to Vol. 39. All other communications should be addressed to the managing editor, or Elaine Barth, University of California, Los Angeles, California, 90024.

The Pacific Journal of Mathematics expects the author's institution to pay page charges, and reserves the right to delay publication for nonpayment of charges in case of financial emergency.

100 reprints are provided free for each article, only if page charges have been substantially paid. Additional copies may be obtained at cost in multiples of 50.

---

The *Pacific Journal of Mathematics* is issued monthly as of January 1966. Regular subscription rate: \$72.00 a year (6 Vols., 12 issues). Special rate: \$36.00 a year to individual members of supporting institutions.

Subscriptions, orders for back numbers, and changes of address should be sent to Pacific Journal of Mathematics, 103 Highland Boulevard, Berkeley, California, 94708.

PUBLISHED BY PACIFIC JOURNAL OF MATHEMATICS, A NON-PROFIT CORPORATION

Printed at Kokusai Bunken Insatsusha (International Academic Printing Co., Ltd.).  
8-8, 3-chome, Takadanobaba, Shinjuku-ku, Tokyo 160, Japan.