

BULLETIN

ISSN 0004-9727

of the

AUSTRALIAN MATHEMATICAL SOCIETY

Volume 28 Number 3

December 1983

Pseudocomplemented distributive lattices with small endomorphism monoids	
by M. E. Adams, V. Koubek and J. Sichler	305
Coefficient estimates for alpha-spiral functions	
by B. L. Bhatia and S. Rajasekaran	319
Existence of limit cycles for a class of autonomous systems	
by Anthony Sofó	331
A note on complete hypersurfaces of non-positive Ricci curvature	
by G. H. Smith	339
On pendent drops in a capillary tube	
by G. Huisken	343
Finite simple groups and finite primitive permutation groups	
by Cheryl E. Praeger	355
Prolongations of linear connections to the frame bundle	
by Luis A. Cordero and Manuel de Leon	367
On two new classes of locally convex spaces	
by Kazuaki Kitahara	383
On convex and starlike univalent functions	
by R. K. Pandey and G. P. Bhargava.	393
On complete reducibility of module bundles	
by G. Prema and B. S. Kiranagi	401
On approximation in spaces of continuous functions	
by Heinz H. Gonska	411
A radius of convexity problem	
by K. S. Padmanabhan and M. S. Ganesan	433
ABSTRACTS OF AUSTRALASIAN PhD THESES	
Controlled Markov processes and related semigroups of operators	
by Volf Frishling.	441
Topics in the theory of latin squares	
by Bohdan Peter Smetaniuk	443
Finite element error estimates for nonlinear elliptic problems of monotone type	
by Shue-Sum Chow	445
Relative relation modules of finite groups	
by M. Yamin	447

The University of Queensland Press, St Lucia, Queensland, 4067, Australia

Printed in Australia by Watson Ferguson & Co.

Registered by Australia Post—Publication No. QBQ2945

BULLETIN OF THE AUSTRALIAN MATHEMATICAL SOCIETY

Editor: Sidney A. Morris

Deputy Editor: K. R. Pearson

Honorary Editor: B. H. Neumann

Associate Editors

Robert S. Anderssen	B. J. Gardner	Sheila Oates-Williams	G. Szekeres
Alan L. Andrew	J. R. J. Groves	A. J. van der Poorten	D. G. Tacon
B. D. Craven	D. A. Holton	J. H. Rubinstein	Colin J. Thompson
Brian A. Davey	D. C. Hunt	Leon Simon	H. B. Thompson
P. Donovan	P. E. Kloeden	Ross Street	Rudolf Vyborny
J. A. Eccleston	Rodney Nillsen		

Assistant Editors

Robert S. Anderssen

M. S. Brooks

INFORMATION FOR AUTHORS

The BULLETIN of the Australian Mathematical Society aims at quick publication of original research in all branches of mathematics. Timely expository articles are also welcomed.

To ensure speedy publication, editorial decisions on acceptance or otherwise are taken quickly, normally within a month of receipt of the paper. Papers are accepted only after being evaluated by the Editor and an Associate Editor or another expert. Of course responsibility for the correctness of results published in the BULLETIN remains with the authors.

For a paper to be acceptable for publication, not only should it contain new and interesting results but also

- (i) the exposition should be clear and attractive, and
- (ii) the manuscript should be in publishable form, without revision.

Nevertheless some meritorious papers will have to be rejected because speed of publication involves space limitations.

Authors should submit THREE clean, high quality copies to
The Editor, Bulletin of the Australian Mathematical Society,
Department of Pure Mathematics, La Trobe University,
Bundoora, Victoria 3083, Australia

but should not send the original typescript of their papers, as material submitted to the BULLETIN will usually not be returned. Authors should note that each paper submitted must include an abstract and one or more classification numbers following the 1980 Mathematics Subject Classification.

As even minor revisions are generally not permitted, authors should read carefully all the details listed on the inside back cover.

Abstracts of PhD Theses

The BULLETIN endeavours to publish abstracts of all accepted Australasian PhD theses in mathematics. One restriction, however, is that the abstract must be received by the Editor within 3 months of the degree being approved.

© **Copyright Statement.** Where necessary, permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by the Treasurer, Australian Mathematical Publishing Association, Inc., for libraries and other uses registered with the Copyright Clearance Center (CCC), provided that the base fee of \$A2.00 per copy of article is paid directly to CCC, 21 Congress Street, Salem, MA 01970, U.S.A. Special requests should be addressed to the Treasurer, Australian Mathematical Publishing Association, Inc., c/- Department of Mathematics, University of Queensland, St. Lucia, Qld., 4067, Australia. Serial-fee code: 0004-9727/83 \$A2.00 + 0.00.

Continued Inside Back Cover

ISSN 0004-9727

BULLETIN

of the

Australian Mathematical Society

Editor: Sidney A. Morris

Deputy Editor: K. R. Pearson

Honorary Editor: B. H. Neumann

Associate Editors

Robert S. Anderssen

Alan L. Andrew

B. D. Craven

Brian A. Davey

P. Donovan

J. A. Eccleston

B. J. Gardner

J. R. J. Groves

D. A. Holton

D. C. Hunt

P. E. Kloeden

Rodney Nilsen

Sheila Oates-Williams

A. J. van der Poorten

J. H. Rubinstein

Leon Simon

Ross Street

G. Szekeres

D. G. Tacon

Colin J. Thompson

H. B. Thompson

Rudolf Vyborny

Assistant Editors

Robert S. Anderssen

M. S. Brooks

VOLUME 28 (1983)

The University of Queensland Press
St Lucia, Queensland, 4067, Australia

Printed by Watson Ferguson & Co., Brisbane, Queensland 4101, Australia

Contents

DENNIS ACREMAN, Asymptotic analysis of partition identities [A]	299
M. E. ADAMS, V. KOUBEK and J. SICHLER, Pseudocomplemented distributive lattices with small endomorphism monoids	305
KEVIN P. BALANDA, Families of partial functions.	77
G. P. BHARGAVA, <i>see</i> R. K. PANDEY	
B. L. BHATIA and S. RAJASEKARAN, Coefficient estimates for alpha-spiral functions	319
WILLIAM D. BLAIR, Commutative rings whose factors have Artinian rings of quotients	9
ROLF BRANDL, On groups with small Engel depth	101
PILAR CEMBRANOS, On Banach spaces of vector valued continuous functions	175
SHUE-SUM CHOW, Finite element error estimates for nonlinear elliptic problems of monotone type [A]	445
LUIS A. CORDERO and MANUEL DE LEON, Prolongations of linear connections to the frame bundle ..	367
SATYA DEO and SUBHASH MUTTEPAWAR, Inverse limit theorem and expansion theorem for cohomological dimension	67
BAU-SEN DU, Are chaotic functions really chaotic	53
P. M. EDWARDS, Eventually regular semigroups	23
TREVOR EVANS and BERNHARD GANTER, Varieties with modular subalgebra lattices	247
VOLF FRISHLING, Controlled Markov processes and related semigroups of operators [A]	441
M. S. GANESAN, <i>see</i> K. S. PADMANABHAN	
BERNHARD GANTER, <i>see</i> TREVOR EVANS	
SERGE GAUTIER, GEORGE ISAC and JEAN-PAUL PENOT, Surjectivity of multifunctions under generalized differentiability assumptions	13
GREG G. GIBBON, Set mappings of unrestricted order	199
JAIRO Z. GONÇALVES, <i>see</i> ARNALDO MANDEL	
HEINZ H. GONSKA, On approximation in spaces of continuous functions	411
K. GOPALSAMY, Stability, instability, oscillation and nonoscillation in scalar integrodifferential systems	233
JANET A. HOSKINS, CHERYL E. PRAEGER and ANNE PENFOLD STREET, Twills with bounded float length	255
G. HUISKEN, On pendent drops in a capillary tube	343
GEORGE ISAC, <i>see</i> SERGE GAUTIER	
PHILIP JOHN KACHOYAN, Non-linear effects in laminar flow over wavy surfaces [A]	303
P. E. KENNE, Presentations for some direct products of groups	131
B. S. KIRANAGI, <i>see</i> G. PREMA	
KAZUAKI KITAHARA, On two new classes of locally convex spaces	383
RONALD A. KNIGHT, A characterization of recurrent motions.	1
H.-B. KNOOP and B. STOCKENBERG, On Hermite-Fejér type interpolation	39
MATTHEW WILLIAM KNUIMAN, Combining information in linear and log-linear analyses [A]	293
V. KOUBEK, <i>see</i> M. E. ADAMS	
MANUEL DE LEON, <i>see</i> LUIS A. CORDERO	
ANDRZEJ MADRECKI, Relation between the Shapley value and null group cohomology.	187
ARNALDO MANDEL and JAIRO Z. GONÇALVES, Free k -tuples in linear groups	151
REX W. MATTHEWS, Permutation polynomials in one and several variables [A]	287
SUBHASH MUTTEPAWAR, <i>see</i> SATYA DEO	
K. S. PADMANABHAN and M. S. GANESAN, A radius of convexity problem.	433
R. K. PANDEY and G. P. BHARGAVA, On convex and starlike univalent functions.	393
B. P. PARASHAR, The difference operators and extended Laguerre polynomials	111
R. PARVATHAM and T. N. SHANMUGAM, On analytic functions with reference to an integral operator	207
MARIA CRISTINA PEDICCHIO, Closed structures on the category of topological spaces determined by systems of filters	161
JEAN-PAUL PENOT, <i>see</i> SERGE GAUTIER	
CHERYL E. PRAEGER, Finite simple groups and finite primitive permutation groups	355

CHERYL E. PRAEGER, <i>see</i> JANET A. HOSKINS	
G. PREMA and B. S. KIRANAGI, On complete reducibility of module bundles	401
A. J. PRYDE, Variational formulation of higher order elliptic boundary value problems .	135
S. RAJASEKARAN, <i>see</i> B. L. BHATIA	
TIMOTHY R. C. READ, On choosing a goodness-of-fit test [A].	295
JOHN CHARLES RENAUD, On modular representation algebras of cyclic p -groups [A]	291
J. ARIAS DE REYNA, A connected metric space without an equally spaced chain of points	283
A. V. V. SATYANARAYANA, <i>see</i> PREM SINGH	
P. R. SCOTT, A boundedness condition for sets with lattice point constraints	5
T. N. SHANMUGAM, <i>see</i> R. PARVATHAM	
J. SICHLER, <i>see</i> M. E. ADAMS	
PREM SINGH and A. V. V. SATYANARAYANA, Subordination theorems for p -valent functions with initial gaps	121
BOHDAN PETER SMETANIUK, Topics in the theory of latin squares [A]	443
FRANCIS R. SMITH, On the existence of embedded minimal 2-spheres in the 3-sphere, endowed with an arbitrary metric [A].	159
G. H. SMITH, A note on complete hypersurfaces of non-positive Ricci curvature.	339
ANTHONY SOFO, Existence of limit cycles for a class of autonomous systems	331
B. STOCKENBERG, <i>see</i> H.-B. KNOOP	
ANNE PENFOLD STREET, <i>see</i> JANET A. HOSKINS	
NEIL S. TRUDINGER and JOHN I. E. URBAS, The Dirichlet problem for the equation of prescribed Gauss curvature	217
JOHN I. E. URBAS, <i>see</i> NEIL S. TRUDINGER	
SHINJI YAMASHITA, Beurling's ordinary value	91
M. YAMIN, Relative relation modules of finite groups [A]	447

[A] Abstract of Australasian PhD thesis.