

# BULLETIN

# Volume 5 (1971)

## of the Australian Mathematical Society

## Number 3

M. K. Singal and Pushpa Jain	<i>On subparacompact and countably subparacompact spaces</i>	289
R. S. Anderssen	<i>Exact variational representations for the solution of the simple parabolic equation</i>	305
Neil S. Trudinger	<i>On the analyticity of generalized minimal surfaces</i>	315
J. L. Hickman	<i>Some definitions of finiteness</i>	321
Roger D. Bleier	<i>Minimal vector lattice covers</i>	331
Jon F. Carlson	<i>Block idempotents and the Brauer correspondence</i>	337
L. G. Kovács and M. R. Vaughan-Lee	<i>A problem of Hanna Neumann on closed sets of group words</i>	341
V. Venu Gopal Rao and B. N. Sahney	<i>On a sequence of Fourier coefficients</i>	343
Ludwig Arnold	<i>The log log law for multidimensional stochastic integrals and diffusion processes</i>	351
J. A. Loustau	<i>On a class of power-associative periodic rings</i>	357
E. Chislett and C. S. Hoo	<i>Coretraction-fibrations are retractions</i>	363
J. N. Ward	<i>On finite soluble groups and the fixed-point groups of automorphisms</i>	375
S. Bachmuth and H. Y. Mochizuki	<i>Third Engel groups and the Macdonald-Neumann conjecture</i>	379
L. Narici, G. Bachman and E. Beckenstein	<i>The weak density of the non-invertible elements of a commutative algebra</i>	387
J. R. J. Groves	<i>Varieties of soluble groups and a dichotomy of P. Hall</i>	391
Donald P. Minassian	<i>Remark on ordered abelian groups</i>	411
Kurt Mahler	<i>An elementary existence theorem for entire functions</i>	415
W. D. Wallis	<i>Construction of strongly regular graphs using affine designs: Corrigenda</i>	431
Abstracts of Australasian Ph.D. theses		
Joachim A. Hempel	<i>Superlinear variational boundary value problems and nonuniqueness</i>	421
William H. Cornish	<i>Abelian Rickart semirings</i>	423
Helen E. Adams	<i>Filtrations and valuations on rings</i>	425
B. P. Garfoot	<i>Perturbation methods applied to the nonlinear symmetric bending of circular elastic plates.</i>	427
D. G. Tacon	<i>Compactness-type problems in topological vector spaces. A treatment mainly from the viewpoint of non-standard analysis</i>	429

Bull. Austral. Math. Soc. Vol. 5 (1971) No. 3, pp. 289-431

THE UNIVERSITY OF QUEENSLAND PRESS  
ST LUCIA, QUEENSLAND 4067

## THE AUSTRALIAN MATHEMATICAL SOCIETY

President: G. E. Wall      University of Sydney  
Secretary: W. Pye        Secondary Teachers' College, Victoria, 3052  
Treasurer: V. G. Hart    University of Queensland  
(These officers serve until May 1972)

### Membership and correspondence

Applications for membership, notices of change of address or title or position, and other correspondence, except as noted below, should be sent to:

The Secretary, Australian Mathematical Society,  
Secondary Teachers' College,  
Swanston Street, Parkville, Victoria 3052, Australia.

Subscriptions and correspondence related to accounts should be addressed to:

The Treasurer, Australian Mathematical Society,  
Department of Mathematics,  
University of Queensland,  
St Lucia, Queensland 4067, Australia.

Correspondence about the distribution of the Society's JOURNAL and BULLETIN should be addressed to:

The Business Manager, Australian Mathematical Society,  
Department of Mathematics,  
University of Queensland,  
St Lucia, Queensland 4067, Australia.

The annual subscription is \$50 for Institutions and \$16 in 1971 for Ordinary Members. Junior Members (undergraduate and junior graduate students) may ask to have their subscription reduced to \$6 in 1971. Members of other mathematical societies with which the Australian Mathematical Society has entered into reciprocity agreements are admitted to membership and its privileges at half the current rates, if they are not normally resident in Australia.

Members of the Society receive copies of the JOURNAL free, and may subscribe to the BULLETIN at the price of \$4 per volume (\$8 p.a.). Members may elect to receive the BULLETIN instead of the JOURNAL.

### The JOURNAL of the Australian Mathematical Society

The JOURNAL began publication in 1959. From 1972, two volumes of four parts will be published annually, at a price of \$25 per volume. Subscription orders and orders for back numbers should be sent to the Business Manager (address above). Manuscripts for publication should be sent to the Editor:

Professor B. Mond,  
Department of Mathematics,  
La Trobe University,  
Bundoora, Victoria 3083, Australia,

or to one of the Associate Editors listed in a recent part of the JOURNAL.

*(Continued inside back cover)*

**BULLETIN**  
of the  
**Australian Mathematical Society**

edited by

B. H. Neumann

A. McMullen

L. G. Kovács

S. Yamamuro

**VOLUME 5 (1971)**

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

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

# Contents

HELEN E. ADAMS, Filtrations and valuations on rings (Abstract of Ph.D. thesis) .. ..	425
A. R. AMIR-MOÉZ and C. R. PERRY, Remarks on theorems of Thompson and Freede .. ..	221
R. S. ANDERSEN, Exact variational representations for the solution of the simple parabolic equation .. ..	305
A. L. ANDREW, Variational solution of certain nonlinear eigenvalue problems (Abstract of Ph.D. thesis) .. ..	137
LUDWIG ARNOLD, The log log law of multidimensional stochastic integrals and diffusion processes .. ..	351
G. BACHMAN, <i>see</i> L. NARICI	
S. BACHMUTH and H. Y. MOCHIZUKI, Third Engel groups and the Macdonald-Neumann conjecture .. ..	379
GILBERT BAUMSLAG, Finitely generated cyclic extensions of free groups are residually finite ..	87
GILBERT BAUMSLAG, A finitely generated, infinitely related group with trivial multiplier ..	131
JOHN A. BEACHY, Cotorsion radicals and projective modules .. ..	241
E. BECKENSTEIN, <i>see</i> L. NARICI	
J. R. BLAKE, Self propulsion due to oscillations on the surface of a cylinder at low Reynolds number .. ..	255
ROGER D. BLEIER, Minimal vector lattice covers .. ..	331
ALLAN BRACE and D. E. DAYKIN, A finite set covering theorem .. ..	197
A. BROWN, On the differential equations for tide-well systems .. ..	175
R. M. BRYANT and L. G. KOVÁCS, A note on generalized characters .. ..	265
JON F. CARLSON, Block idempotents and the Brauer correspondence .. ..	337
E. CHISLETT and C. S. HOO, Coretraction-fibrations are retractions .. ..	363
C. CHRISTENSEN, Rings with a few more zero-divisors .. ..	271
B. E. CLANCY, Multigroup neutron transport theory in plane geometry (Abstract of Ph.D. thesis)	287
WILLIAM H. CORNISH, Abelian Rickart semirings (Abstract of Ph.D. thesis) .. ..	423
SUSAN DANCS, The sub-near-field structure of finite near-fields .. ..	275
BRIAN DAY, Construction of bi-closed categories (Abstract of Ph.D. thesis) .. ..	139
D. E. DAYKIN, <i>see</i> ALAN BRUCE	
J. B. DIAZ and R. VÝBORNÝ, On some mean value theorems of the differential calculus .. ..	227
D. G. FITZ-GERALD and G. B. PRESTON, Divisibility of binary relations .. ..	75
B. P. GARFOOT, Perturbation methods applied to the nonlinear symmetric bending of circular elastic plates (Abstract of Ph.D. thesis) .. ..	427
J. R. GILES, A Banach space with support homeomorphism is reflexive .. ..	187
J. R. J. GROVES, On varieties of soluble groups .. ..	95
J. R. J. GROVES, Varieties of soluble groups and a dichotomy of P. Hall .. ..	391
JOACHIM A. HEMPEL, Superlinear variational boundary value problems and nonuniqueness (Abstract of Ph.D. thesis) .. ..	421
C. C. HEYDE and J. R. LESLIE, Improved classical limit analogues for Galton-Watson processes with or without immigration .. ..	145
J. L. HICKMAN, Some definitions of finiteness .. ..	321
C. S. HOO, <i>see</i> E. CHISLETT	
DAVID C. HUNT, Character tables of certain finite simple groups .. ..	1
MASAKO IZUMI and SHIN-ICHI IZUMI, Integrability of trigonometric series III .. ..	205
SHIN-ICHI IZUMI, <i>see</i> MASAKO IZUMI	
PUSHPA JAIN, <i>see</i> M. K. SINGAL	
L. G. KOVÁCS and M. R. VAUGHAN-LEE, A problem of Hanna Neumann on closed sets of group words .. ..	341
L. G. KOVÁCS, <i>see</i> R. M. BRYANT	
ALAN LAMBERT, Unitary equivalence and reducibility of invertibly weighted shifts .. ..	157
J. R. LESLIE, <i>see</i> C. C. HEYDE	

J. A. LOUSTAU, On a class of power-associative periodic rings .. .. .	357
JAMES M. MCPHERSON, A family of non-invertible prime links: Corrigendum .. .. .	141
KURT MAHLER, An arithmetic remark on entire periodic functions .. .. .	191
KURT MAHLER, An elementary existence theorem for entire functions .. .. .	415
DONALD P. MINASSIAN, Remark on ordered abelian groups .. .. .	411
H. Y. MOCHIZUKI, <i>see</i> S. BACHMUTH	
L. NARICI, G. BACHMAN and E. BECKENSTEIN, The weak density of the non-invertible elements of a commutative algebra .. .. .	387
PAUL PENTONY, Laws in torsion-free nilpotent varieties with particular reference to the laws of free nilpotent groups (Abstract of Ph.D. thesis) .. .. .	283
C. R. PERRY, <i>see</i> A. R. AMIR-MOÉZ	
G. B. PRESTON, <i>see</i> D. G. FITZ-GERALD	
V. VENU GOPAL RAO and B. N. SAHNEY, On the sequence of Fourier coefficients .. .. .	343
B. N. SAHNEY, <i>see</i> V. VENU GOPAL RAO	
M. K. SINGAL and PUSHPA JAIN, On subparacompact and countably subparacompact spaces .. .. .	289
D. G. TACON, Compactness-type problems in topological vector spaces. A treatment mainly from the viewpoint of non-standard analysis (Abstract of Ph.D. thesis) .. .. .	429
M. C. THORNTON, Torsion topological groups with minimal open sets .. .. .	55
NEIL S. TRUDINGER, On the analyticity of generalized minimal surfaces .. .. .	315
A. J. VAN DER POORTEN, Perfect approximation of functions .. .. .	117
M. R. VAUGHAN-LEE, On product varieties of groups .. .. .	239
M. R. VAUGHAN-LEE, <i>see</i> L. G. KOVÁCS	
R. VÝBORNÝ, <i>see</i> J. B. DIAZ	
JENNIFER WALLIS, A skew-Hadamard matrix of order 92 .. .. .	203
JENNIFER WALLIS, Combinatorial matrices (Abstract of Ph.D. thesis) .. .. .	285
W. D. WALLIS, Construction of strongly regular graphs using affine designs: Corrigenda .. .. .	431
J. N. WARD, On finite groups admitting automorphisms with nilpotent fixed-point groups .. .. .	281
J. N. WARD, On finite soluble groups and the fixed-point groups of automorphisms .. .. .	375
A. M. WATTS, A singular perturbation problem with a turning point .. .. .	61
A. M. WATTS, The temperature outside a heated plume .. .. .	111
WILBUR WHITTEN, On prime non-invertible links .. .. .	127
HIAN-POH YAP, Maximal sum-free sets in finite abelian groups II .. .. .	43