

# PROCEEDINGS

OF THE

## EDINBURGH MATHEMATICAL SOCIETY

### CONTENTS

C. M. CAMPBELL, E. F. ROBERTSON AND R. M. THOMAS: Finite groups of deficiency zero involving the Lucas numbers	<i>page 1</i>
J. F. T. HARTNEY: On the decomposition of the $s$ -radical of a near-ring	<i>page 11</i>
MARK V. LAWSON: Rees matrix semigroups	<i>page 23</i>
F. J. KORKES AND T. PORTER: Pro- $C$ completions of crossed modules	<i>page 39</i>
E. ANSARI-PIRI: A class of factorable topological algebras	<i>page 53</i>
R. COSTA: Principal train algebras of rank 3 and dimension $\leq 5$	<i>page 61</i>
WERNER J. RICKER: Completeness of the $L^1$ -space of closed vector measures	<i>page 71</i>
SUNGYUN LEE: Kinematic formula and tube formula in space of constant curvature	<i>page 79</i>
DANG DING HAI: Existence and uniqueness of solutions for a nonlinear second order differential equation in Hilbert space	<i>page 89</i>
B. A. F. WEHRFRITZ: Some matrix groups over finite-dimensional division algebras	<i>page 97</i>
T. H. LENAGAN AND EDWARD S. LETZTER: The fundamental prime ideals of a noetherian prime PI ring	<i>page 113</i>
KAREL STROETHOFF: Nevanlinna-type characterizations for the Bloch space and related spaces	<i>page 123</i>
SHIAN GAO: A further result on the complex oscillation theory of periodic second order linear differential equations	<i>page 143</i>
K. D. MAGILL, Jr.: More on the countability index and the density index of $S(X)$	<i>page 159</i>
BOOK REVIEWS	<i>Page 165</i>

SCOTTISH ACADEMIC PRESS

# PROCEEDINGS

## OF THE EDINBURGH MATHEMATICAL SOCIETY

### EDITORS

**K. A. BROWN**  
*University of Glasgow*

**T. A. GILLESPIE**  
*University of Edinburgh*

**C. J. SHADDOCK**  
*University of Edinburgh*

**C. M. CAMPBELL**  
*University of St Andrews*

**J. HOWIE**  
*Heriot-Watt University*

**B. D. SLEEMAN**  
*University of Dundee*

### CONSULTING EDITORS

**W. B. ARVESON**  
Department of Mathematics  
University of California, Berkeley  
Berkeley, California 94720  
U.S.A.

Sir **MICHAEL ATIYAH, F.R.S.**  
Mathematical Institute  
24-29 St Giles  
Oxford OX1 3LB

**G. BROWN**  
Department of Pure Mathematics  
University of New South Wales  
P.O. Box 1  
New South Wales 2033  
Australia

**D. L. BURKHOLDER**  
Department of Mathematics  
University of Illinois at Urbana-Champaign  
Urbana, IL 61801  
U.S.A.

**D. L. COLTON**  
Math. Sci. Department  
University of Delaware  
Newark DE 19711  
U.S.A.

**C. M. GORDON**  
Department of Mathematics  
University of Texas at Austin  
Austin, Texas 78712  
U.S.A.

**O. H. KEGEL**  
Mathematisches Institut  
Albert-Ludwigs-Universität  
D-7800 Freiburg i.Br.  
Albertstrasse 23b  
West Germany

**J. B. McLEOD**  
Wadham College  
Oxford OX1 3PN

**S. J. PATTERSON**  
Mathematisches Institut  
Georg-August-Universität  
D-3400 Göttingen  
Bunsenstrasse 3-5  
West Germany

**G. STRANG**  
Department of Mathematics  
Massachusetts Institute of Technology  
Cambridge, Mass. 02139  
U.S.A.