CODEN IJMTAW PAGES 531-697

# ILLINOIS <br> JOURNAL <br> O F <br> MATHEMATICS 

a quarterly journal published by the UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
edited by
LOUIS AUSLANDER
KUO-TSAI CHEN
MAHLON M. DAY
FRANK B. KNIGHT
IRVING REINER
HAROLD M. STARK
KAREN UHLENBECK

## ILLINOIS JOURNAL OF MATHEMATICS

## Manuscript

Original research papers in pure and applied mathematics intended for publication in this journal may be written in English, French or German. They should be addressed to the Illinois Journal of Mathematics, 1409 West Green Street, University of Illinois at Urbana-Champaign, Illinois 61801, or one of the editors:

Louis Auslander, Department of Mathematics, Graduate School and University Center, 33 West 42nd Street, City University of New York, New York, N.Y. 10036.

Kuo-Tsai Chen, Department of Mathematics, 1409 West Green Street, University of Illinois at Urbana-Champaign, Illinois 61801.

Frank B. Knight, Department of Mathematics, 1409 West Green Street, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.

Mahlon M. Day (Managing Editor), Department of Mathematics, 1409 West Green Street, University of Illinois at Urbana-Champaign, Urbana, Illinois, 61801.

Irving Reiner, Department of Mathematics, 1409 West Green Street, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.

Harold M. Stark, Department of Mathematics C-012, University of California at San Diego, La Jolla, California 92093.

Karen Uhlenbeck, Department of Mathematics, Box 4348, University of Illinois at Chicago Circle, Chicago, Illinois 60680.

[^0]
## Proof

Authors will receive only galley proof. Proof sent to North American addresses will be accompanied by manuscript and sent by first class mail. To other addresses, proof will be sent by airmail, and manuscript will be sent only if requested. Authors are asked to return proof (and manuscript if sent) by the same class of mail that was used in sending it to them.

## Page charges

To cover a part of the cost of production, the author's institution will be billed for $\$ 40$ per page.

## Reprints

One hundred free reprints are supplied to the sole author of a paper: fifty free reprints are supplied to each author of a joint paper. Additional reprints may be purchased.

[^1]
## ILLINOIS <br> JOURNAL <br> O F <br> MATHEMATICS

a quarterly journal published by the
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
edited by
FELIX ALBRECHT
LOUIS AUSLANDER
KUO-TSAI CHEN
MAHLON M. DAY
FRANK B. KNIGHT
IRVING REINER
LEE A. RUBEL
HAROLD M. STARK
DANIEL W. STROOCK
KAREN UHLENBECK

## CONTENTS

Vol. $26 \quad 1982$

Pages
Alzubaidy, Kahtan, Metacyclic p-groups and Chern classes . . . 423-431
Babakhanian, Ari and Hironka, Heisuke, Formal functions over
Grassmannians . . . . . . . . . . . . . . . . . 201-211
Bagchi, S. C. and Sitaram, A., Determining sets for measures on
$R^{n}$. . . . . . . . . . . . . . . . . . . . . . 419-422
Beatson, R. K., Chui, C. K. and Hasson, M., Degree of best inverse
approximation by polynomials . . . . . . . . . . . . 173-180
Bell, Steven R., A representation theorem in strictly pseudoconvex
domains . . . . . . . . . . . . . . . . . . . 19-26
Bergery, Lionel Berard and Bourguignon, Jean-Pierre, Lapla-
cians and Riemannian submersions with totally geodesic fibres . 181-200
Bombieri, E. and Sperber, S., On the p-adic analyticity of solutions
of linear differential equations . . . . . . . . . . . . $10-18$
Bourguignon, Jean-Pierre and Bergery, Lionel Bérard, Laplacians and Riemannian submersions with totally geodesic fibres . 181-200
Brewer, Dennis W., Locally Lipschitz continuous functional differ- ential equations and nonlinear semigroups

374-381

Bujalance, E., Normal N.E.C. signatures . . . . . . . . . . 519-530
Chui, C. K., Beatson, R. K. and Hasson, M., Degree of best inverse
approximation by polynomials . . . . . . . . . . . . 173-180
D'Angelo, John P., Orders of contact of real and complex sub-
varieties . . . . . . . . . . . . . . . . . . . 41-51
DeGeorge, David L. and Reddy, William, L., Branch set linking
for non-orientable manifolds. . . . . . . . . . . . . 382-387
Drouilhet, S. J., Criteria for algebraic dependence of meromorphic
mappings into algebraic varieties . . . . . . . . . . . 492-502
Elliott, P. D. T. A., The exponential function characterized by an
approximate functional equation . . . . . . . . . . . 503-518
Foote, Richard, Component type theorems for finite groups in
characterstic 2. . . . . . . . . . . . . . . . . . 62-111
Friedman, Avner, Asymptotic behavior for the free boundary of parabolic variational inequalities and applications to sequential analysis.

653-697
Gamelin, T. W., Criteria for approximation by harmonic functions . 353-357
Giller, Cole A., Towards a classical knot theory for surfaces in $\mathbb{R}^{4}$. 591-631
Goldfeather, Jay E., Certain secondary operations that detect in-
compressible maps . . . . . . . . . . . . . . . . 412-418
Pages
Gross, Fred and Yang, Chung-Chun, Meromorphic functions covering certain finite sets at the same points ..... 432-441
Grosshans, Frank D., The variety of points which are not semi- stable ..... 138-148
Guerrero, Ignacio, Holomorphic families of compact Riemann surfaces with automorphisms ..... 212-225
Hasson, M., Beatson, R. K. and Chui, C. K., Degree of best inverse approximation by polynomials ..... 173-180
Heath, Philip R. and Kamps, Klaus Heiner, On exact orbit sequences ..... 149-154
Hebda, James, An inequality between the volume and the convexity radius of a Riemannian manifold ..... 642-649
Hironka, Heisuke and Babakhanian, Ari, Formal functions over Grassmannians ..... 201-211
Huneke, Craig, On the associated graded ring of an ideal ..... 121-137
Ivić, A. and Shiu, P., The distribution of powerful integers ..... 576-590
Kahn, Steven M., Fibering complex manifolds over $S^{3}$ and $S^{4}$ ..... 296-316
Kamps, Klaus Heiner and Heath, Philip R., On exact orbit sequences ..... 149-154
Karel, Martin L., Values of certain Whittaker functions on a $p$-adic reductive group ..... 552-575
Koumoullis, G., Perfect, $u$-additive measures and strict topologies ..... 466-478
Larcher, H., The cusp amplitudes of the congruence subgroups of the classical modular group ..... 164-172
Lashof, R. K., Equivariant bundles ..... 257-271
Lau, Anthony To-Ming, Invariantly complemented subspaces of $L_{\infty}(G)$ and amenable locally compact groups ..... 226-235
Ledger, A. J. and Razavi, A. R., Reduced $\Sigma$-spaces ..... 272-292
Leroux, Pierre, The isomorphism problem for incidence algebras of Möbius categories ..... 52-61
Lotz, H. P. and Porta, H., On extreme points ..... 650-652
Luschgy, Harald, Extreme invariant extensions of probability measures and probability contents. ..... 27-40
Ocken, Stanley, Embeddings of $S^{n} \times M$ in $S^{n+2} \times M$ form a group ..... 236-251
Pickel, P. F., Finite quotients and multiplicities in nilpotent groups ..... 155-163
Pomerance, Carl, A new lower bound for the pseudoprime count- ing function ..... 4-9
Porta, H. and Lotz, H. P., On extreme points ..... 650-652
Prikry, Karel and Sudderth, William, Singularity with respect to strategic measures ..... 460-465

## Pages

Rabinowitz, Joshua H., Characterizing 2-dimensional Moishezon spaces by weakly positive coherent analytic sheaves ..... 637-641
Razavi, A. R. and Ledger, A. J., Reduced $\boldsymbol{\Sigma}$-spaces ..... 272-292
Reddy, William L. and DeGeorge, David L., Branch set linking for non-orientable manifolds. ..... 382-387
Ruppert, Wolfgang, On semitopological compactifications of non-Abelian groups ..... 388-411
Schafer, James A., Finite complexes and integral representations ..... 442-459
Selick, Paul, A bound on the rank of $\pi_{q}\left(S^{n}\right)$ ..... 293-295
Shiu, P. and Ivić, A., The distribution of powerful integers ..... 576-590
Sitaram, A. and Bagchi, S. C., Determining sets for measures on $R^{n}$ ..... 419-422
Sommen, F., Hypercomplex Fourier and Laplace transforms I . ..... 332-352
Sperber, S. and Bombieri, E., On the p-adic analyticity of solutions of linear differential equations ..... 10-18
Sudderth, William and Prikry, Karel, Singularity with respect to strategic measures ..... 460-465
Sundar, Viji and Walter, J. H., The automorphisms of $P U_{4}^{+}(K, f)$ ..... 531-551
Tilgner, Hans, An algebraic concept of symplectic curvature struc- tures ..... 322-331
Walter, J. H. and Sundar, Visi, The automorphisms of $P U_{4}^{+}(K, f)$ ..... 531-551
Walum, Herbert, An exact formula for an average of L-series ..... 1-3
Wang, James Li-Ming, Approximation by rational modules in Lip $\alpha$ norms ..... 632-636
Waterhouse, William C., Polynomial group laws over valuation rings ..... 252-256
White, H. E., Jr., Variants of Blumberg's theorem ..... 359-373
Wilker, Peter, Recursion formula with application to algebra, number theory, and combinatorics ..... 479-491
Williams, Dana P., Transformation group $C^{*}$-algebras with Haus- dorff spectrum ..... 317-321
Yang, Chung-Chun and Gross, Fred, Meromorphic functions covering certain finite sets at the same points ..... 432-441
Zecca, Pietro, On the exponential stability of set-valued differen- tial equations ..... 112-120


[^0]:    All papers should be typewritten, double-spaced, and the author should keep a complete copy. Bibliography and footnotes should be typed, double-spaced, on separate sheets of paper. Figures should be drawn separately in black ink on white paper suitable for being photographed.

[^1]:    The illinois journal of mathematics (ISSN 0019-2089) is published quarterly by the University of Illinois Press. Entered as second-class matter June 4, 1957 at the post office at Urbana, Illinois, under the act of August 24, 1912. Office of publication, University of Illinois Press, 54 E. Gregory Drive. Box 5081, Station A, Champaign, Illinois 61920.

