

***ILLINOIS  
JOURNAL  
OF  
MATHEMATICS***

.....

*a quarterly journal published by the*  
**UNIVERSITY OF ILLINOIS, URBANA**

.....

*edited by*

**REINHOLD BAER**

**PAUL T. BATEMAN**

**J. L. DOOB**

**A. H. TAUB**

**GEORGE W. WHITEHEAD**

**OSCAR ZARISKI**

# ILLINOIS JOURNAL OF MATHEMATICS

## Manuscripts

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

REINHOLD BAER, Mathematisches Seminar der Universität, Frankfurt am Main, Schumannstr 58, Germany.

PAUL T. BATEMAN, Department of Mathematics, University of Illinois, Urbana, Illinois.

J. L. DOOB, Department of Mathematics, University of Illinois, Urbana, Illinois.

A. H. TAUB, Department of Mathematics, University of Illinois, Urbana, Illinois.

GEORGE W. WHITEHEAD, Massachusetts Institute of Technology, Cambridge 39, Massachusetts.

OSCAR ZARISKI, Department of Mathematics, Harvard University, 2 Divinity Avenue, Cambridge 38, Massachusetts.

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.

## 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.

## 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 from Waverly Press.

The ILLINOIS JOURNAL OF MATHEMATICS is published quarterly by the University of Illinois. 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, Urbana, Ill.

© 1959, Board of Trustees, University of Illinois.  
Made in U. S. A.

*ILLINOIS*  
*JOURNAL*  
*OF*  
*MATHEMATICS*

.....

*a quarterly journal published by the*  
UNIVERSITY OF ILLINOIS, URBANA

.....

*edited by*

REINHOLD BAER

PAUL T. BATEMAN

J. L. DOOB

A. H. TAUB

GEORGE W. WHITEHEAD

OSCAR ZARISKI



## CONTENTS

Volume 3

1959

	pages
ABIAN, SMBAT and BROWN, ARTHUR B., On the solution of an implicit equation. . . . .	374-380
ALBERT, A. A. and THOMPSON, JOHN, Two-element generation of the projective unimodular group. . . . .	421-439
ANDERSON, FRANK W. and BLAIR, ROBERT L., Characterizations of the algebra of all real-valued continuous functions on a completely regular space. . . . .	121-133
ARONSON, D. G., The fundamental solution of a linear parabolic equation containing a small parameter. . . . .	580-619
ARSOVE, MAYNARD G., A new proof of the convergence theorem for $\delta$ -subharmonic functions. . . . .	217-221
ASSMUS, E. F., JR., On the homology of local rings. . . . .	187-199
AUSLANDER, JOSEPH, Mean-L-stable systems. . . . .	566-579
AUSTIN, D. G., The generalized backward Kolmogorov equation in abstract space. . . . .	532-537
BOAS, R. P., JR., A variational method for trigonometric polynomials. . . . .	1- 10
BLAIR, ROBERT L., with ANDERSON, FRANK W., Characterizations of the algebra of all real-valued continuous functions on a completely regular space. . . . .	121-133
BROWN, ARTHUR B., with ABIAN, SMBAT, On the solution of an implicit equation. . . . .	374-380
CALDERÓN, ALBERTO, SPITZER, FRANK, and WIDOM, HAROLD, Inversion of Toeplitz matrices. . . . .	490-498
CROWELL, RICHARD H., Nonalternating links. . . . .	101-120
CURTIS, CHARLES W., Quasi-Frobenius rings and Galois theory. . . . .	134-144
DADE, EVERETT C., Abelian groups of unimodular matrices. . . . .	11- 27
DAVIS, CHANDLER, Various averaging operations onto subalgebras. . . . .	538-553

	pages
DOLD, ALBRECHT and LASHOF, RICHARD, Principal quasifibrations and fibre homotopy equivalence of bundles. . . . .	285-305
EISENSTADT, B. J. and LORENTZ, G. G., Boolean rings and Banach lattices. . . . .	524-531
ELLIOTT, JOANNE, Absorbing barrier processes connected with the symmetric stable densities. . . . .	200-216
FELLER, WILLIAM, Differential operators with the positive maxi- mum property. . . . .	182-186
GASCHÜTZ, WOLFGANG, Die Eulersche Funktion endlicher auf- lösbarer Gruppen. . . . .	469-476
GIL DE LAMADRID, JESÚS, Topology of mappings and differentia- tion processes. . . . .	408-420
GOLOMB, MICHAEL, Solution of certain nonautonomous differential systems by series of exponential functions. . . . .	45- 65
GRUENBERG, K. W., The Engel elements of a soluble group. . . . .	151-168
HELLER, ALEX, A note on spaces with operators. . . . .	98-100
HICKS, N., A theorem on affine connexions. . . . .	242-254
HILDEBRANDT, T. H., On systems of linear differentio-Stieltjes- integral equations. . . . .	352-373
HOCHSCHILD, G., Algebraic Lie algebras and representative functions.	499-523
KARLIN, SAMUEL and MCGREGOR, JAMES, Random walks. . . . .	66- 81
KLEINFELD, ERWIN, Finite Hjelslev planes. . . . .	403-407
LASHOF, RICHARD, with DOLD, ALBRECHT, Principal quasifibrations and fibre homotopy equivalence of bundles. . . . .	285-305
LEHMER, D. H., On the exact number of primes less than a given limit. . . . .	381-388
LEVINSON, NORMAN, Limiting theorems for Galton-Watson branch- ing process. . . . .	554-565
LORENTZ, G. G., with EISENSTADT, B. J., Boolean rings and Banach lattices. . . . .	524-531
LUTHAR, INDAR S., Uniqueness of the invariant mean on an abelian semigroup . . . . .	28-44
MATTUCK, ARTHUR, The irreducibility of the regular series on an algebraic variety. . . . .	145-149
MCGREGOR, JAMES, with KARLIN, SAMUEL, Random walks. . . . .	66- 81

	pages
McSHANE, E. J., A canonical form for antiderivatives. . . . .	334-351
NAGATA, MASAYOSHI, On the purity of branch loci in regular local rings . . . . .	328-333
NUNKE, R. J., Modules of extensions over Dedekind rings. . . . .	222-241
PICKERT, GÜNTER, Bemerkungen über die projektive Gruppe einer Moufang-Ebene. . . . .	169-173
REE, RIMHAK, On generalized conjugate classes in a finite group. . . . .	440-444
SALZMANN, HELMUT, Viereckstransitivität der kleinen projektiven Gruppe einer Moufang-Ebene. . . . .	174-181
SAMPSON, J. H. and WASHNITZER, G., A Künneth formula for coherent algebraic sheaves. . . . .	389-402
SAMUEL, PIERRE, Multiplicités de certaines composantes singulières. . . . .	319-327
SMART, D. R., Eigenfunction expansions in $L^p$ and $C$ . . . . .	82- 97
SPITZER, FRANK, with CALDERÓN, ALBERTO and WIDOM, HAROLD, Inversion of Toeplitz matrices. . . . .	490-498
SUZUKI, MICHIO, On finite groups containing an element of order four which commutes only with its powers. . . . .	255-271
THOMPSON, JOHN, with ALBERT, A. A., Two-element generation of the projective unimodular group. . . . .	421-439
VINOGRADÉ, B. and WEEG, G. P., Maximally uncleft rings and algebras . . . . .	272-284
WALTER, JOHN H., Structure of cleft rings I. . . . .	445-467
WASHNITZER, G., with SAMPSON, J. H., A Künneth formula for coherent algebraic sheaves. . . . .	389-402
WEEG, G. P., with VINOGRADÉ, B., Maximally uncleft rings and algebras . . . . .	272-284
WIDOM, HAROLD, with CALDERÓN, ALBERTO and SPITZER, FRANK, Inversion of Toeplitz matrices. . . . .	490-498
WILANSKY, ALBERT and ZELLER, KARL, Correction to "Banach algebra and summability". . . . .	468
WOLFOWITZ, J., Strong converse of the coding theorem for semi-continuous channels. . . . .	477-489
ZAPPA, GUIDO, Su una classe di gruppi finiti introdotta da McLain. . . . .	307-318
ZELLER, KARL, with WILANSKY, ALBERT, Correction to "Banach algebra and summability". . . . .	468