## AFFORDS AN OPPORTUNITY TO MAKE CREATIVE CONTRIBUTIONS IN THE DESIGN AND DEVELOPMENT OF LARGE-SCALE SYSTEMS

Formed under the sponsorship of the Massachusetts Institute of Technology, with a professional staff nucleus of the men who designed and developed the SAGE System, it is MITRE's responsibility to provide the required scientific and engineering services for the integration of air defense systems.
Inherent within this continuing system engineering task is an opportunity for mathematicians to range widely across their discipline and explore new mathematical areas applicable to computer-based systems operating in real time. Immediate career openings are available for individuals with qualifications prerequisite to making important individual contributions in these areas:

\author{

- Operations Research and Analysis - Logic <br> - Applied Mathematics <br> - Mathematical and Numerical Analysis <br> - Computer Design and Analysis <br> - Probability Theory <br> - Communication Theory <br> - Statistics <br> - Game Theory <br> - Programming Research <br> - Field Theory - Mathematical Model Building <br> - Computer Programming
}

Conveniently located in suburban Boston, MITRE's modern facilities afford mathematicians some of the most up-to-date computer equipment obtainable: Two largescale, high-speed digital computers - the IBM 704 and an experimental SAGE AN/FSQ-7. These machines will soon be augmented by an IBM 7090 and a solid state SAGE computer.
Equally challenging openings exist at MITRE's additional computer facilities in Fort Walton Beach, Florida and Montgomery, Alabama.

To arrange an immediate confidential interview please send resume to Dana N. Burdette, Personnel Director
THE MITRE CORPORATION
244 Wood Street - Lexington 73, Massachusetts

A brochure more fully describing MITRE and its activities is available on request.

## THE PROCEEDINGS OF THE SYMPOSIA IN APPLIED MATHEMATICS

These symposia were held under the auspices of the American Mathematical Society and other interested organizations. The Society itself published the first two volumes. The McGraw-Hill Book Company, Inc., published and sold Numbers 3 through 8. These six volumes have now been transferred to the American Mathematical Society by special arrangement with the McGrawHill Book Company, Inc. Orders should be placed through the Society.

Members of the Society will henceforth be entitled to the usual $25 \%$ discount on all of the volumes. Heretofore this privilege was available to members only for the first two volumes.

Vol. 1. Non-linear problems in me- Vol. 5. Wave motion and vibration chanics of continua, 1949. theory, 1954.
vii +219 pp. List price: $\$ 5.25$
$\mathrm{vi}+169$ pp. List price: $\$ 7.00$

Vol. 2. Electromagnetic theory, 1950. iii +91 pp. List price: $\$ 3.00$

Vol. 6. Numerical analysis, 1956. $\mathrm{vi}+303 \mathrm{pp}$. List price: $\$ 9.75$

Vol. 7. Applied probability, 1957.
$\mathrm{v}+104 \mathrm{pp}$. List price: $\$ 5.00$
Vol. 8. Calculus of variations and its applications, 1958.
$\mathrm{v}+153 \mathrm{pp}$. List price: $\$ 7.50$

IN PREPARATION:
Volume 9. Orbit theory. Editor R. E. Langer. Approx. $\$ 8.00$
Volume 10. Combinatorial designs and analysis. Editor R. E. Bellman

Order from
AMERICAN MATHEMATICAL SOCIETY
190 Hope Street, Providence 6, R.I.

## Colloquium Publication

Volume 23

## DRTHDGDNAL POLYNDMIALS

by<br>Gabor Szegö

This is a revision of a well-known and definitive treatment of the classical orthogonal polynomials published by the author in this series in 1939. A total of twenty pages has been added, including an appendix which discusses the Pollaczek polynomials.

> WITH CHAPTERS ON
> General properties of orthogonal polynomials
> Jacobi polynomials
> Laguerre and Hermite polynomials
> Zeros of orthogonal polynomials Inequalities
> Asymptotic properties of the classical polynomials
> Expansion problems associated with the classical polynomials
> Representation of positive functions
> Polynomials orthogonal on the unit circle
> Asymptotic properties of general orthogonal polynomials
> Expansion problems associated with general orthogonal polynomials Interpolation
> Mechanical quadrature
> Polynomials orthogonal on an arbitrary curve
> Problems and exercises
$25 \%$ discount to members

## AMERICAN MATHEMATICAL SOCIETY <br> 190 Hope Street <br> Providence 6, R.I.

## THE ANNALS OF MATHEMATICAL STATISTICS

## Vol. 30, No. 2-June, 1959

Optimum Designs in Regression Problems
J. Kiefer and J. Wolfowitz

Some Optimum Weighing Designs
Damaraju Raghavarao
Some Contributions to ANOVA in One or More Dimensions: I S. N. Roy and R. Gnanadesikan
Some Contributions to ANOVA in One or More Di
mentions: II S. N. Roy and R. Gnanadesikan
Unbiased estimation: Functions of Location and Scale Parameters R. F. Tate
An Extension of the Cramér-Rao Inequality
John J. Gart
On the Attainment of Cramér-Rao and Bhattacharyya Bounds for the Variance of an Estimate
A. V. Fend

The Lagrangian Multiplier Test S. D. Silvey Intuitive Probability on Finite Sets

Charles H. Kraft
John W. Pratt, and A. Seidenberg
K-Sample Analogues of the Kolmogorov-Smirnov and
Cramér-v. Mises Tests J. Kiefer
Asymptotic Expansions for the Smirnov Test and for the Range of Cumulative Sums
J. H. B. Kemperman

Asymptotic Minimax Character of the Sample Dis tribution Function for Vector Chance Variables
J. Kiefer and J. Wonfowitz

Bayes Solution of the Statistical Inventory Problem
Herbert Scarf
A Generalization of the Beta-Distribution
J. G. Mauldon

Determining Bounds on Integrals with Application to Cataloging Problems Bernard Harris On a General Concept of "In Probability"

John W. Pratt
Densities for Stochastic Processes
Charlotte T. Striebel
The Supremum and Infimum of the Poisson Process Ronald Pyke

Notes:
A Note on a class of Problems in "Normal" Multivariate Analysis of Variance
S. N. Roy and J. Roy

Note on an Application of the Schumann-Bradley Table Irwin D. J. Bros
On a Theorem of Lévy-Raikov A. Devinatz
Note on the Factorial Moments of the Distribution of Locally Maximal Elements in a Random Sample M. O. Glasgow
The Limiting Joint Distribution of the Largest and Smallest Sample Spacings Liones Weiss Generalized $\mathrm{D}_{n}{ }^{+}$Statistics A. P. Dempster Applications of a Certain Representation of the Wishart Matrix Robert A. Wijsman
On Dvoretzky's Stochastic Approximation Theorem C. Derman and J. Sacks

On a Problem of Robbins J. R. Isbell
Acknowledgment of Priority J. N. K. Rao
Addendum
Charles E. Clark and G. Trevor Whliams
Abstract of Papers
News and Notices
Report of the Pittsburgh Meeting
Report of the Cleveland Meeting
Publications Received
Address orders for subscriptions and back numbers to

## A. H. BOWKER, Treasurer DEPARTMENT OF STATISTICS, STANFORD UNIVERSITY <br> Stanford, California

## MATHEMATICAL REVIEWS

A Journal Containing Reviews of the Mathematical Literature of the World, with full Subject and Author Indices

Sponsored by
The American Mathematical Society
The Mathematical Association of America
The Society for Industrial and Applied Mathematics
The Institute of Mathematical Statistics
The Edinburgh Mathematical Society
Société Mathématique de France
Dansk Matematisk Forening
Het Wiskundig Genootschap te Amsterdam

The London Mathematical Society Polskie Towarzystwo Matematyozne Unión Matemática Argentina Indian Mathematical Society Unione Matematica Italiana

Subscriptions accepted to cover the calendar year only. Issues appear monthly except July. $\$ 50.00$ per year. $\$ 25.00$ to individual members of sponsoring organizations. An edition printed on one side, for bibliographical purposes, is available at an additional charge of $\$ 1.00$ per year. Unesco Book Coupons may be used in payment.

Send subscription orders to

```
AMERICAN MATHEMATICAL
            SOCIETY
    190 Hope Street
    Providence 6, R.I.
```



MEMOIR 31

PERIODIC SOLUTIONS OF

$$
x^{\prime \prime}+c x^{\prime}+g(x)=f(t)
$$

by
W. S. LOUD

58 pp.
$\$ 2.00$
$\mathbf{2 5 \%}$ discount to members

## AMERICAN MATHEMATICAL SOCIETY

190 Hope Street
Providence 6, Rhode Island

## THE AMERICAN MATHEMATICAL SOCIETY

 respectfully invites and deeply appreciates BEQUESTS AND OTHER CAPITAL GIFTSA legacy or other capital gift to the American Mathematical Society is an effective contribution to the advancement of mathematical research. Investment income provides essential support for the activities of the Society, and most of it is derived from gifts and bequests which have been made over the years by persons interested in mathematics.

It is the policy of the Society to recognize a donor by attaching his name, or any other name specified by him as a memorial, to the fund given by him or to the activity supported by the fund. Gifts and bequests to the Society are deductible for income, gift, and state tax purposes.


AMERICAN MATHEMATICAL SOCIETY

## ILLINOIS <br> JOURNAL OF <br> MATHEMATICS

A quarterly journal of basic research in pure and applied mathematics published by the University of Illinois, Urbana.
edited by
REINHOLD BAER - J. L. DOOB
A. H. TAUB - GEORGE W. WHITEHEAD PAUL T. BATEMAN • OSCAR ZARISKI

The subscription price is $\$ 9.00$ a volume (four numbers); this is reduced to $\$ 5.00$ for individual members of the American Mathematical Society. Subscriptions should be sent to the University of Illinois Press, Urbana, Illinois.

## AUTHORS WANTED BY N. Y. PUBLISHER

Leading book publisher seeks manuscripts of all types: fiction, non-fiction, poetry, scholarly and religious works, etc. New authors welcomed. Send for free booklet E4. Vantage Press, 120 W. 31 St. New York 1

## MEMOIR 33

## COHOMOLOGY THEORY

 AND ALGEBRAIC CORRESPONDENCES96 pp.
$\$ 1.90$
$25 \%$ discount to members AMERICAN MATHEMATICAL SOCIETY 190 Hope Street Providence 6, Rhode Island

Now In Its Second Year . . .

## THE PHYSICS OF FLUIDS

EDITOR, F. N. Frenkiel

Devoted to original contributions to the physics of fluids covering kinetic theory, statistical mechanics, structure and general physics of gases, liquids, plasmas and other fluids and including:

- Magneto-Fluid Dynamics
- Ionized Fluid and Plasma Physics
- Shock and Detonation Wave Phenomena
- Dynamics of Compressible Fluids
- Boundary Layer and Turbulence Phenomena
- Liquid State Physics and Superfluidity
- Hypersonic Physics
- Rarefied Gas Phenomena
- Upper Atmosphere Phenomena
- Physical Aeronomy
- Transport Phenomena
- Hydrodynamics

As well as certain basic aspects of physics of fluids bordering geophysics, astrophysics, biophysics and other fields of science:

Bi-monthly : Non Members- $\$ 10.00$ domestic, $\$ 11.00$ foreign
Members of member societies- $\$ 8.00$ domestic, $\$ 9.00$ foreign A.P.S. in lieu- $\$ 4.00$ domestic, $\$ 5.00$ foreign

Orders and inquiries should be sent to:
American Institute of Physics, 335 East 45 Street, New York 17, N.Y.

## Bulletin of the American Mathematical Society

This journal is the official organ of the Society. It reports official acts of the Society and the details of its meetings. It contains some of the officially invited addresses presented before the Society, reviews of advanced mathematical books, research problems and a department of research announcements.

The subscription price is $\$ 7.00$ per annual volume of six numbers.
Research Problems and Invited Addresses offered for publication should be sent to B. J. Pettis, Department of Mathematics, University of North Carolina, Chapel Hill, N. C.; Book reviews to J. C. Oxtoby, Bryn Mawr College, Bryn Mawr, Pa. Research Announcements offered for publication should be sent to some member of the Council of the Society, and communicated by him to E. E. MoIse, Department of Mathematics, University of Michigan, Ann Arbor, Mich. All other communications to the editors should be sent to the Managing Editor, J. C. Oxtory.

The members of the Council for 1959 are: E. F. Beckenbach, E. G. Begle, R. E. Bellman, Lipman Bers, R. H. Bing, Garrett Birkhoff, R. P. Boas, Salomon Bochner, Richard Brauer, R. H. Bruck, S. S. Chern, J. A. Dieudonné, J. L. Doob, Samuel Eilenberg, P. R. Garabedian, A. M. Gleason, J. W. Green, P. R. Halmos, Edwin Hewitt, Einar Hille, G. P. Hochschild, G. B. Huff, Nathan Jacobson, Irving Kaplansky, D. H. Lehmer, L. H. Loomis, E. J. McShane, W. S. Massey, A. E. Meder, Jr., E. E. Moise, J. C. Oxtoby, B. J. Pettis, R. S. Pierce, Everett Pitcher, G. de B. Robinson, P. C. Rosenbloom, Walter Rudin, Hans Samelson, I. J. Schoenberg, I. E. Segal, N. E. Steenrod, A. W. Tucker, S. M. Ulam, J. W. T. Youngs, Leo Zippin.

## Proceedings of the American Mathematical Society

This journal is devoted entirely to research in pure and applied mathematics and is devoted principally to the publication of original papers of moderate length.

The subscription price is $\$ 11.00$ per annual volume of six numbers.
Papers in algebra and number theory should be sent to Irving Kaplansixy, Eckhart Hall, University of Chicago, Chicago 37, Ill.; in probability, real variables, logic and foundations to P. R. Halmos, Eckhart Hall, University of Chicago, Chicago 37, Ill.; in abstract analysis to either P. R. Halmos or IRving Kaplansky; in geometry and topology to Hans Samelson, Department of Mathematics, University of Michigan, Ann Arbor, Mich.; in other branches of analysis, applied mathematics, and all other fields to R.P. Boas, Lunt Building, Northwestern University, Evanston, III. All other communications to the editors should be addressed to the Managing Editor, Irving Kaplansixy.

## Transactions of the American Mathematical Society

This journal is devoted entirely to research in pure and applied mathematics, and includes in general longer papers than the Procerdings.

Four volumes of three numbers each will be published in 1958. The subscription price is $\$ 8.00$ per volume.

Papers in analysis, applied mathematics and probability should be sent to LIPMAN Bers, Institute of Mathematical Sciences, New York University, New York, N. Y.; in topology, and logic and foundations to Samuil Etienberg, Hamilton Hall, Columbia University, New York 27, N. Y.; in algebra and number theory to G. P. Hochschild, Department of Mathematics, University of California, Berkeley 4, Calif.; in geometry and abstract analysis to I. M. Singer, Massachusetts Institute of Technology, Cambridge 39, Mass. All other communications to the editors should be addressed to the Managing Editor, Samuel Eilenberg.

## Mathematical Reviews

This journal contains abstracts and reviews of the current mathematical literature of the world. It is sponsored by thirteen mathematical organizations, located both in the United States and abroad.

Mathematical Reviews is published monthly, excepting July. The subscription price is $\$ 50.00$ per annual volume of eleven numbers.

## Notices of the American Mathematical Society

This journal announces the programs of the meetings of the Society. It carries the abstracts of all contributed papers presented at the meetings of the Society and publishes news items of interest to mathematical scientists.

The subscription price is $\$ 7.00$ per annual volume of 7 numbers. A single copy is $\$ 2.00$.
All communications should be addressed to the Editor, G. L. Walker, 190 Hope Street, Providence 6, R. I. News items and insertions for each issue must be in the hands of the editor on or before the deadline for the abstracts of the papers to be presented in the meetings announced in that issue. These deadlines are published regularly on the inside front cover page.

# Some Recent Publications of the Society 

E. Snapper. Cohomology theory and algebraic correspondences. Memoir 33. ..... \$ 1.90
L. P. Eisenhart. Non-Riemannian geometry. Published in 1927 and reprinted in 1958, Colloquium Volume 8. ..... $\$ 4.90$
R. S. Pierce. Translation lattices. Memoir 32. ..... \$ 1.70
E. Hille and R. S. Phillips. Functional analysis and semi-groups. An enlarged and completely revised edition of Colloquium Volume 31, of the same title, by Hille. ..... $\$ 13.80$
J. L. Walsh. Interpolation and approximation. An enlarged and extensively revised edition of Colloquium Volume 20. ..... $\$ 7.00$
W. H. Gottschalk and G. A. Hedlund. Topological dynamics. Colloquium Volume 36. ..... $\$ 5.10$
N. Jacobson. Structure of rings. Colloquium Volume 37. ..... $\$ 7.70$
C. Chevalley. Introduction to the theory of algebraic functions of one variable. Mathematical Surveys Volume 6. ..... $\$ 4.00$
S. Bergman. The kernel function and conformal mapping. Mathematical Sur- veys Volume 5. ..... $\$ 4.00$
O. F. G. Schilling. The theory of valuations. Mathematical Surveys Volume 4. ..... $\$ 6.00$
M. Marden. The geometry of the seros of a polynomial in a complex domain. Mathematical Surveys Volume 3. ..... $\$ 5.00$
Russian Translations. Volume 8. Twelve papers on function theory, probabil- ity, and dufferential equations. ..... \$ 6.00
Russian Translations. Volume 9. Four papers on group theory. ..... $\$ 5.00$
Russian Translations. Volume 10. Thirteen papers on analysis. ..... \$ 6.60
Russian Translations. Volume 11. Four papers on topology. ..... $\$ 5.90$
The price to members of the American Mathematical Society is $25 \%$ less than list.A complete catalog of publications will be sent upon request
American Mathematical Society190 Hope Street, Providence 6, Rhode Island

