

## Machine, Assembly, and Systems Programing on the IBM 360

W. H. PAYNE. Conforms to topics suggested by the ACM Curriculum ' 68 . Contains 38 tested programs. April. $\$ 4.95$ (tentative); paper

## Introduction to PL/ 1 Programming

R. C. SPROWLS. Presents a subset of PL/l illustrating its wide range of applications. February. \$3.95 (tentative); paper

## A Course in Numerical Analysis

H. M. LIEBERSTEIN. Stresses finite difference methods for solving linear algebraic systems. 258 pp.; \$14.95

## Computers

A Programming Problem Approach Revised Edition
R. C. SPROWLS. A solid grounding in the problem-solving uses of the computer. Instruc tor's Manual. 399 pp.; \$9.95

Harper \& Row, Publishers

49 E. 33d St., New York 10016

# SOME MATHEMATICAL PROBLEMS IN BIOLOGY 

## Volume 1 <br> LECTURES ON MATHEMATICS IN THE LIFE SCIENCES

The text of this first volume is comprised of lectures given at a symposium held in conjunction with the December 1966 meeting of the American Association of the Advancement of Science. It contains articles by such men as E. G. Leigh, R. C. Lewontin and Theodosios Pavlides. Sponsored by the American Mathematical Society, the meeting dealt with mathematical theories from a biological point of view.
117 pages; List Price \$6.10; Member Price $\$ 4.58$
AMERICAN MATHEMATICAL SOCIETY
P. O. Box 6248, Providence, R. I. 02904
(Act of October 23, 1962; Section 4369, Title 39, United States Code)

1. Date of filing: September 24, 1968
2. Title of Publication: Mathematics of Computation
. Frequency of issue: Four issues per year
3. Location of known office of publication: P. O. Box 6248, Providence, R. I. 02904
4. Location of the headquarters or general business offices of the publishers: P. O. Box 6248, Providence, R. I. 02904
5. Names and addresses of publisher, editor, and managing editor: Publisher: American Mathematical Society, P. O. Box 6248, Providence, R. I. 02904; Editor: Eugene Isaacson, Chairman of Editorial Committee, P. O. Box 6248, Providence, R. I. 02904; Managing Editor: None
6. Owner: None
7. Known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities: None
8. The purpose, function and nonprofit status of
this organization and the exempt status for Federal income tax purposes have not changed during the preceding 12 month
9. Extent and nature of circulation

| Average | Actual |
| :---: | :---: |
| number | number |
| of copies | of copies |
| of each | of single |
| issue | issue |
| during | pub'd |
| preceding | nearest to |
| 12 | filing |
| months | date |
| 3,850 | 3,800 |
| 2,800 | 2,729 |
| 2,800 | 2,729 |
| 40 | 40 |
| 2,440 | 2,765 |
| 1,010 | 1,035 |
| 3,850 | 3,800 |

I certify that the statements made by me above are correct and complete.-Gordon L. Walker

for approval copies, write Box 903

COMPUTATION: Finite and Infinite Machines by Marvin L. Minsky,
Professor of Electrical Engineering, Massachusetts Institute of Technology.
Provides an introduction to the theories of finite-state machines, programmed computers, Turing machines and formal languages (in the form of Post Systems). 1967, 317 pp., \$12.95

## COMPUTERS AND THE POLICY

 MAKING COMMUNITY Application to International Relations by Davis B. Bobrow, Senior Social Scientist, Oak Ridge National Laboratory and Judah L. Schwartz, Education Research Center, Massachusetts Institute of Technology. An introduction to the nature of the computer and its applications to the analysis, conduct and teaching of international relations. In the Prentice-Hall Automatic Computation Series, Edited by George Forsythe. 400 pp., Nov. 68, \$12.50PROGRAMMING LANGUAGES: History and Fundamentals by Jean E. Sammet, Programming Language Technology Manager, Federal Systems Division, IBM Corporation. Presents an overall view of higher level languages; bringing together in one place, fundamental information on programming languages, including history, general characteristics, similarities and differences. Provides specific, basic information on all significant and most minor programming languages. In the Prentice-Hall Automatic Computation Series, Edited by George Forsythe.
Nov. 68, approx. 704 pp., $\$ 12.95$
PRENTICE-HALL ENGLEWOOD CLIFFS NEW JERSEY 07632
Reviews and Descriptions of Tables and Books ..... 207
Baburin \& Lebedev 1, Ditkin \& Prudnikov 4, Forte 11, Gutschick \& Ludwig 5, Jarden 9, Kloss, Newman \& Ordman 10, Lomkatsi 6, Russel \& Lal 8, Sauer \& Szabo 3, Spira 7, Voigt 2
Table Errata ..... 217
Kortum \& McNiel 431, Lehmer 432
Corrigenda ..... 219Thompson, Kortum \& McNiel, Lal \& Blundon

# Mathematics of Computation <br> TABLE OF CONTENTS 

Jandary 1969
Uniform Asymptotic Solution of Second Order Linear Differential Equations without Turning Varieties Gilbert Stengle ..... 1
R. B. Kellogg A Nonlinear Alternating Direction Method ..... 23
Numerical Solution of the Dirichlet Problem for Systems of Circular Con- ductors between Parallel Ground Lines . . . . David W. Kammler ..... 29
Generalized Finite-Difference Schemes
Blair Swartz \& Burton Wendroff ..... 37
Expansions for Coulomb Wave Functions J. Boersma ..... 51
On the Series Expansion Method for Computing Incomplete Elliptic Integrals of the First and Second Kinds H. Van de Vel ..... 61
Further Asymptotic Expansions for the Error Functional
B. W. Ninham \& J. N. Lyness ..... 71
A New Approximation for the Chi-Square Integral
H. L. Gray, R. W. Thompson \& G. V. McWilliams ..... 85
Summation of Series of Positive Terms by Condensation Transformations James W. Daniel ..... 91
The Double Points of Mathieu's Differential Equation
G. Blanch \& D. S. Clemm ..... 97
On the Condition of a Matrix Arising in the Numerical Inversion of the Laplace Transform . . . . . . . . . . . . . Walter Gautschi ..... 109
A Simple Set of Test Matrices for Eigenvalue Programs C. W. Gear ..... 119
Reduction of Functions of Some Partitioned Matrices
Victor Lovass-Nagy \& David L. Powers ..... 127
Computation of Isomorphism Classes of $p$-Groups
Rodney James \& John Cannon ..... 135
On the Lattice Constant for $\left|x^{3}+y^{3}+z^{3}\right| \leqq 1$. . . . W. G. Spohn ..... 141
On Gauss's Class Number Problems ..... 151
Technical Notes and Short Papers
On a Theorem of Piatetsky-Shapiro and Approximation of Multiple Integrals . . . . . . . Seymour Haber \& Charles F. Osgood ..... 165
On the Solid-Packing Constant for Circles Z. A. Melzak ..... 169
Sbme Extensions of Legendre Quadrature A. C. R. Newbery ..... 173
Remarks on the Iterative Solution of the Neumann Problem on a Rec- tangle by Successive Line Over-Relaxation . . . Fred W. Dorr ..... 177
Iterates of a Number-Theoretic Function. Mohan Lal ..... 181
Computer Investigation of Landau's Theorem P. S. Chiang ..... 185
The Explicit Inverses of Two Commonly Occurring Matrices
D. Kershaw ..... 189
Extremal Properties of Balanced Tri-Diagonal Matrices
Peter A. Businger ..... 193
Computing Multiplicative Inverses in $\mathrm{GF}(p)$. . George E. Collins ..... 197
On Designs of Maximal $(+1,-1)$-Matrices of Order $n \equiv 2(\bmod 4)$. IIC. H. Yang201

