THE FIBONACCI QUARTERLY

THE OFFICIAL JOURNAL OF THE FIBONACCI ASSOCIATION



NUMBER 5

CONTENTS

PART I — ADVANCED

Arrays of Binomial Coefficients Whose Products are Squares Calvin T. Long	449
Generalized Fibonacci Polynomials Marjorie Bicknell and V. E. Hoggatt, Jr.	457
Periodicity Over the Ring of Matrices	466
Special Determinants Found within Generalized Pascal Triangles V. E. Hoggatt, Jr., and Marjorie Bicknell	469
Note on a Combinatorial Algebraic Identity and its Application L. C. Hsu	480
A Solution to the Classical Problem of Finding Systems of Three Mutually Orthogonal Numbers in a Cube Formed by Three Superimposed $10 \times 10 \times 10$ Cubes Joseph Arkin	485
A Further Analysis of Benford's Law	490
A Fibonacci-Related Series in an Aspect of Information Retrieval Michael F. Lynch	495
Advanced Problems and Solutions	501
PART II - ELEMENTARY	
On the Number of Divisions Needed in Finding the Greatest Common Divisor Dale D. Shea	508
A Primer for the Fibonacci Numbers: Part XIII	511
A Fibonacci Probability Function	517
Some General Fibonacci Shift Formulae	523
More Hidden Hexagon Squares	525
The Balmer Series and the Fibonacci Numbers J. Wlodarski	526
A Polynomial with Generalized Fibonacci Coefficients Bruce W. King	527
Another Proof for a Continued Fraction Identity	533
On the Periodicity of the Terminal Digits in Fibonacci Sequences. $\ . \ . \ Daniel \ Lance \ Herrick$	535
Geometric Proof of a Result of Lehmer's	j 5 3 9
Fibonacci and Apollonius	541
A Method for Constructing Singly Even Magic Squares Jerome Rothstein	543
The Z Transform and the Fibonacci Sequence	545
On Generalized Fibonacci Quaternions	547
Elementary Problems and Solutions	550
Volume Index	.554

DECEMBER

VOLUME 11

THE FIBONACCI QUARTERLY

THE OFFICIAL JOURNAL OF THE FIBONACCI ASSOCIATION

DEVOTED TO THE STUDY OF INTEGERS WITH SPECIAL PROPERTIES

CO-EDITORS

V. E. Hoggatt, Jr.

Marjorie Bicknell

EDITORIAL BOARD

H. L. Alder
John L. Brown, Jr.
Brother A. Brousseau
Paul F. Byrd
L. Carlitz
H. W. Eves
H. W. Gould

A. P. Hillman David A. Klarner Donald E. Knuth C. T. Long M. N. S. Swamy D. E. Thoro

WITH THE COOPERATION OF

Terry Brennan Maxey Brooke Calvin D. Crabill T. A. Davis John H. Halton A. F. Horadam Dov Jarden Stephen Jerbic L. H. Lange D. A. Lind James Maxwell Sister M. DeSales McNabb Gerald Preston D. W. Robinson Azriel Rosenfeld Lloyd Walker Charles H. Wall

The California Mathematics Council

All subscription correspondence should be addressed to Brother Alfred Brousseau, St. Mary's College, California 94575. All checks (\$8.00 per year) should be made out to the Fibonacci Association or the Fibonacci Quarterly. Two copies of manuscripts intended for publication in the Quarterly should be sent to Verner E. Hoggatt, Jr., Mathematics Department, San Jose State University, San Jose, California 95192. All manuscripts should be typed, double-spaced. Drawings should be made the same size as they will appear in the Quarterly, and should be done in India ink on either vellum or bond paper. Authors should keep a copy of the manuscript sent to the editors.

The Quarterly is entered as third-class mail at the St. Mary's College Post Office, Calif., as an official publication of the Fibonacci Association.

The Quarterly is published in February, April, October, and December each year.