

Contents

Preface	v
1. Fibonacci Sequences	1
<i>Brother Alfred Brousseau, Saint Mary's College, Moraga, California</i>	
Intuitive Discovery of Fibonacci Relations, 1 ■ Fibonacci Sequences and the Golden Section Ratio, 4 ■ Fibonacci Numbers in the World, 6	
2. Projective Geometry	10
<i>Donald J. Dessart, University of Tennessee, Knoxville, Tennessee</i>	
What Is Projective Geometry? 10 ■ Principle of Duality, 11 ■ Desargues's Theorem, 13 ■ Pascal's Theorem, 15 ■ Cross Ratio, 16 ■ Harmonic Set of Points, 19	
3. Groups	22
<i>Roy Dubisch, University of Washington, Seattle, Washington</i>	
What Is a Group? 22 ■ Isomorphic Groups, 25 ■ Subgroups, 27 ■ Cyclic Groups, 28	
4. Infinity and Transfinite Numbers	30
<i>Sister Conrad Monrad, S.P., Saint Mary-of-the-Woods College, Saint Mary-of-the-Woods, Indiana</i>	
Classical Problems Involving Infinity, 30 ■ Denumerable Sets, 32 ■ Rationals as a Denumerable Set, 33 ■ Are the Real Numbers Denumerable? 34 ■ Cardinality of Infinite Sets, 36	

5.	Pascal's Triangle	39
	<i>John D. Neff, Georgia Institute of Technology, Atlanta, Georgia</i>	
	Arithmetic, 40 ■ Set Theory, 40 ■ Algebra, 41 ■ Plane Geometry, 42	
	■ Probability, 42 ■ Trigonometry, 43 ■ Solid Geometry, 43 ■ Calculus, 44	
	■ Linear Algebra, 45 ■ Miscellaneous, 45	
6.	Topology	47
	<i>Bruce E. Meserve, University of Vermont, Burlington, Vermont</i>	
	<i>Dorothy T. Meserve, Fairfax, Vermont</i>	
	Topologically Equivalent Figures, 47 ■ Traversable Networks, 51 ■ The Möbius Strip, 54	
7.	Experiments with Natural Numbers	57
	<i>Richard V. Andree, University of Oklahoma, Norman, Oklahoma</i>	
	Sums, 57 ■ Palindromes, 60 ■ Related Digits, 60 ■ Factorials, 64 ■ Superprimes, 65	
	■ Recursive Function, 66 ■ Zeros, 68 ■ Irrational Approximations, 69	
	■ Goldbach's Conjectures, 70 ■ Euclid's Primes, 72 ■ Powers of 2, 74	
8.	Non-Euclidean Geometries	76
	<i>Bruce A. Mitchell, Michigan State University, East Lansing, Michigan</i>	
	The Fifth Postulate of Euclid, 76 ■ Absolute Geometry, 77 ■ Hyperbolic Geometry, 78	
	■ Elliptic Geometry, 83	
9.	Boolean Algebras	86
	<i>Wade Ellis, University of Michigan, Ann Arbor, Michigan</i>	
	Propositional Calculus, 87 ■ Boolean Algebras, 91 ■ Systems: $\langle S; \oplus, \odot \rangle$, 93	
	■ Simple Applications of a Boolean Algebra, 94	
10.	The Imaginary and the Infinite in Geometry	97
	<i>Julius H. Hlavaty, Iona College, New Rochelle, New York</i>	
	A Euclidean Paradox, 97 ■ Imaginary Points and Lines, 99 ■ Geometry in the Complex Projective Plane, 101	