

Table of Contents

Preface	vii
Acknowledgement	xi
Table of Contents	xiii
Chapter 1. Error-Correcting Codes	1
Section 1. From the Alt Code to the Hamming Code	1
Section 2. Two Applications of the Hamming Code	7
Section 3. Reed-Muller Code	9
Chapter 2. Regular and Semi-regular Polyhedra	17
Section 1. Regular Polyhedra	17
Section 2. A Polyhedral Metamorphosis	22
Section 3. Semi-Regular Polyhedra	27
Chapter 3. Polyform Compatibility	39
Section 1. Tetris Number Theory	39
Section 2. Tetris Algebra	44
Section 3. Other Compatibility Problems	48
Chapter 4. Mathematical Chess Problems	55
Section 1. Adventures of an Apprentice Rook	55
Section 2. Martin Gardner's Royal Problem	64
Section 3. Knight Tours	71
Chapter 5. Mathematical Induction	85
Section 1. The Towers of Hanoi	85
Section 2. A Problem on Greatest Common Divisors	92
Section 3. Congo Bongo	96
Chapter 6. Number Triangles	103
Section 1. Pascal's Triangle	103
Section 2. Rascal's Triangle	108
Section 3. Triangles of Absolute Difference	112
Chapter 7. Summation Problems	123
Section 1. Sums of Powers of Two	123
Section 2. Zig-Zag	127
Section 3. Two Great Escapes	129

Chapter 8. Finite Projective Geometries	135
Section 1. Lions and Ponies	135
Section 2. Star Wars	142
Section 3. Convenient Buildings	149
Chapter 9. Sharing Loots	153
Section 1. Sharing Jewels	153
Section 2. Sharing Gold and Silver	157
Section 3. Sharing Rum	165
Chapter 10. Puzzling Adventures	171
Section 1. Circuits Checking Circuits	171
Section 2. The Coach's Dilemma	176
Section 3. The Campers' Problem	179
Appendix A Additional Problems	183
Appendix B Solution to Exercises	201

S.M.A.R.T. Circle Projects

Liu, A.C.-F.

2018, XIV, 220 p. 158 illus., Softcover

ISBN: 978-3-319-56810-2