

Contents

Foreword	vii
Preface	xiii
Problem Index	xvii
List of Winners	xviii
1 Eötvös Mathematics Competition Problems	1
2 Combinatorics Problems	9
2.1 Discussion	10
2.1.1 Problem-solving	10
2.1.2 Graph Theory	13
2.1.3 Enumeration Techniques	16
2.1.4 Finite and Infinite Sets	19
2.2 Solutions	22
3 Number Theory Problems	33
3.1 Discussion	34
3.1.1 Mathematical Induction	34
3.1.2 Divisibility	36
3.1.3 Congruence	38
3.1.4 More Combinatorics	40
3.2 Solutions	42
4 Algebra Problems	49
4.1 Discussion	50
4.1.1 Inequalities	50
4.1.2 The Rearrangement Inequality	52

4.2	Solutions	55
5	Geometry Problems Part I	61
5.1	Discussion	62
5.1.1	Geometric Congruence and Inequalities	62
5.1.2	Parallelism	70
5.1.3	Centers of a Triangle	75
5.1.4	Area and Similarity	79
5.2	Solutions	86
6	Geometry Problems Part II	99
6.1	Discussion	100
6.1.1	Circles	100
6.1.2	Coordinate Geometry	105
6.1.3	Trigonometry	109
6.1.4	Vectors and Complex Numbers	113
6.1.5	Solid Geometry	118
6.2	Solutions	119
	Theorem Index	137
	Term Index	139
	Problem Index	142