Contents

Preface	xi
Part I: Background	
1.1. Wang Xiaotong and his book	3
1.2. Public works planning in ancient China	6
1.3. Mathematics education in Tang China	13
1.4. Mathematical background	21
1.5. Extraction of the roots of cubic equations ('Horner's	07
method')	27
1.6. The history of the text of the <i>Jigu suanjing</i>	31
Part II: The mathematics of the <i>Jigu suanjing</i>	
2.1. Problems 7, 9, 13, and 14: Truncated square pyramids	
and cones	35
2.2. Basic methods	49
2.3. Problems 10–12: Parallelepipeds and cylinders	53
2.4. Problem 8: A wedge	60
2.5. Problems 2 and 6: The Grand Astrologer's platform and ra	mp,
and a related problem	64
2.6. Problems 3 and 5: Construction of a dyke, and a related	
problem	82
2.7. Problem 4: Construction of a 'dragon tail' dyke	97
2.8. Problems 15–20: Right triangles	102
2.9. Pythagorean triples	109
2.10. The traditional Chinese algebra of polynomials	110
Part III: Chinese text and translation	
3.0. Introduction: Wang Xiaotong's presentation of his book	
to the Throne	119
3.1. The sun's motion on the ecliptic	122
3.2. The Grand Astrologer's platform and ramp	128
3.3. Construction of a dyke	140
3.4. Construction of a 'dragon tail' dyke	152
3.5. A canal and a canal bank	158
3.6. A rectangular grain cellar	163
3.7. A square granary	168
3.8. A wedge	174
3.9. A circular granary	177
3.10. A square granary and a circular storage pit	181
3.11. Four square granaries and three circular storage pits	185
3.12. Another square granary and circular storage pit	187

43. Construction to derive dimensions of right triangles,	
Problems 17–18	105
44. Construction to derive dimensions of right triangles,	
Problems 19–20	108
45. Text of Zhang Dunren's algebraic derivation of the dimensio	ns
of a right triangle, Problem 17	113