

Contents

Preface	5
1 Basic properties	7
1.1 The definition of Catalan numbers	7
1.2 The fundamental recurrence	8
1.3 A generating function	9
1.4 An explicit formula	10
1.5 Fundamental combinatorial interpretations	11
1.6 A combinatorial proof	16
2 Bijective Exercises	19
3 Bijective Solutions	55
4 Additional Problems	91
5 Solutions to additional problems	123
A In the beginning	151
B History of Catalan Numbers (by Igor Pak)	157
B.1 Ming Antu	157
B.2 Euler and Goldbach	158
B.3 Euler and Segner	159
B.4 Kotelnikow and Fuss	160

B.5	The French school, 1838–1843	160
B.6	The British school, 1857–1891	162
B.7	The ballot problem	162
B.8	Later years	164
B.9	The name	164
B.10	The importance	166
	Glossary	169
	Bibliography	178