

# Contents

Preface . . . . .	v
Chapter 1. Introduction . . . . .	1
Chapter 2. The algebra of polyhedra . . . . .	9
Chapter 3. Linear transformations and polyhedra . . . . .	19
Chapter 4. The structure of polyhedra . . . . .	27
Chapter 5. Polarity . . . . .	41
Chapter 6. Tangent cones. Decompositions modulo polyhedra with lines . . . . .	49
Chapter 7. Open polyhedra . . . . .	57
Chapter 8. The exponential valuation . . . . .	63
Chapter 9. Computing volumes . . . . .	77
Chapter 10. Lattices, bases, and parallelepipeds . . . . .	81
Chapter 11. The Minkowski Convex Body Theorem . . . . .	95
Chapter 12. Reduced basis . . . . .	99
Chapter 13. Exponential sums and generating functions . . . . .	107
Chapter 14. Totally unimodular polytopes . . . . .	121
Chapter 15. Decomposing a 2-dimensional cone into unimodular cones via continued fractions . . . . .	129
Chapter 16. Decomposing a rational cone of an arbitrary dimension into unimodular cones . . . . .	137

Chapter 17.	Efficient counting of integer points in rational polytopes . . . . .	149
Chapter 18.	The polynomial behavior of the number of integer points in polytopes . . . . .	155
Chapter 19.	A valuation on rational cones . . . . .	167
Chapter 20.	A “local” formula for the number of integer points in a polytope . . . . .	183
Bibliography	. . . . .	187
Index	. . . . .	191