

Contents

	Page
Preface	iii
Chapter 1 BASIC PROPERTIES OF CONVEX SETS	
1. 1 Linear, Affine and Convex Dependence	1
1. 2 Transformations	14
1. 3 Three Basic Theorems	22
1. 4 Support Properties	28
Chapter 2 CONVEX POLYTOPES	
2. 1 The Faces of a Convex Polytope	39
2. 2 Polarity and Duality	61
2. 3 Some Special Types of Polytopes	74
(i) Simplices	74
(ii) Pyramids	75
(iii) Bipyramids	77
(iv) Prisms	78
(v) Simplicial and Simple Polytopes	81
(vi) Cyclic polytopes	82
(vii) Neighbourly Polytopes	90
2. 4 Euler's Theorem and the Dehn-Sommerville Equations	93
2. 5 Pulling the Vertices of a Polytope	112

Chapter 3	GALE DIAGRAMS, AND POLYTOPES WITH FEW VERTICES	119
3. 1	Gale Transforms: Geometric Formulation	120
3. 2	Gale Transforms: Algebraic Formulation	127
3. 3	Gale Diagrams	134
3. 4	Polytopes with $d + 2$ and $d + 3$ Vertices	143
Chapter 4	THE UPPER BOUND CONJECTURE FOR SPHERICAL COMPLEXES	
4. 1	Spherical Complexes	152
4. 2	Particular Cases of the U. B. C.	154
Chapter 5	THE UPPER BOUND CONJECTURE FOR POLYTOPES	
5. 1	Reformulations of the Dehn-Sommerville Equations	169
5. 2	Shelling the Boundary Complex	173
5. 3	Remarks	177
References		180
Index		182