

CONTENTS

CHAPTER 1

Preliminaries	1
1.1 Linear Algebra	1
1.2 Group Theory	3

CHAPTER 2

Finite Groups in Two and Three Dimensions	5
2.1 Orthogonal Transformations in Two Dimensions	5
2.2 Finite Groups in Two Dimensions	7
2.3 Orthogonal Transformations in Three Dimensions	9
2.4 Finite Rotation Groups in Three Dimensions	11
2.5 Finite Groups in Three Dimensions	18
2.6 Crystallographic Groups	21
Exercises	22

CHAPTER 3

Fundamental Regions	27
Exercises	32

CHAPTER 4

Coxeter Groups	34
4.1 Root Systems	34
4.2 Fundamental Regions for Coxeter Groups	43
Exercises	50

CHAPTER 5	
Classification of Coxeter Groups	53
5.1 Coxeter Graphs	53
5.2 The Crystallographic Condition	63
5.3 Construction of Irreducible Coxeter Groups	65
5.4 Orders of Irreducible Coxeter Groups	77
Exercises	80
CHAPTER 6	
Generators and Relations for Coxeter Groups	83
Exercises	101
CHAPTER 7	
Invariants	104
7.1 Introduction	104
7.2 Polynomial Functions	105
7.3 Invariants	107
7.4 The Molien Series	112
Exercises	120
Postlude	124
APPENDIX	
Crystallographic Point Groups	127
References	129
Index	131