

CONTENTS

PREFACE TO FIRST EDITION	v
PREFACE TO SECOND EDITION	vii

I. ELEMENTS OF GROUP THEORY

§ 1. The Axioms of Group Theory	1
§ 2. Permutation Groups	4
§ 3. Investigation of Axioms	9
§ 4. Subgroups	10
§ 5. Cyclic Groups	15
§ 6. Finite Rotation Groups	16
§ 7. Calculus of Complexes	19
§ 8. The Concept of Normal Subgroup	23
§ 9. Normalizer, Class Equation	24
§ 10. A Theorem of Frobenius	27

II. THE CONCEPT OF HOMOMORPHY AND GROUPS WITH OPERATORS

§ 1. Homomorphisms	35
§ 2. Representation of Groups by Means of Permutations	39
§ 3. Operators and Operator Homomorphies	44
§ 4. On the Automorphisms of a Group	47
§ 5. Normal Chains and Normal Series	57
§ 6. Commutator Groups and Commutator Forms	78
§ 7. On the Groups of an Algebra	84

III. THE STRUCTURE AND CONSTRUCTION OF COMPOSITE GROUPS

§ 1. Direct Products	109
§ 2. Theorems on Direct Products	112
§ 3. Abelian Groups	117
§ 4. Basis Theorem for Abelian Groups	121
§ 5. On the Order Ideal	123

§ 6. Extension Theory	124
§ 7. Extensions with Cyclic Factor Group	128
§ 8. Extensions with Abelian Factor Group	130
§ 9. Splitting Groups	133

IV. SYLOW p -GROUPS AND p -GROUPS

§ 1. The Sylow Theorem	135
§ 2. Theorems on Sylow p -Groups	138
§ 3. On p -Groups	139
§ 4. On the Enumeration Theorems of the Theory of p -Groups	152
§ 5. On the Descending Central Series	155
§ 6. Hamiltonian Groups	159
§ 7. Applications of Extension Theory	161

V. TRANSFERS INTO A SUBGROUP

§ 1. Monomial Representation and Transfers into a Subgroup	164
§ 2. The Theorems of Burnside and Grün	169
§ 3. Groups whose Sylow Groups are All Cyclic	174
§ 4. The Principal Ideal Theorem	176

APPENDICES

A. Further Exercises for Chap. II	181
B. Structure Theory and Direct Products. A Treatment of Chap. III, § 2 on the Lattice-Theoretical Level	188
C. Free Products and Groups Given by a Set of Generators and a System of Defining Relations	217
D. Further Exercises for Chap. III	230
E. Further Exercises for Chap. IV, § 5	238
F. Further Exercises for Chap. IV., § 1	243
G. A Theorem of Wielandt. An Addendum to Chap. IV	245
H. Further Exercises for Chap. V, § 1	252
FREQUENTLY USED SYMBOLS	253
BIBLIOGRAPHY	255
AUTHOR INDEX	259
INDEX	259