

Table of Contents

Notation	viii
Preface	ix
Part I Linear Methods	1
<i>Chapter 1</i>	
Preliminaries	3
§ 1.1 Groups	3
§ 1.2 Rings and modules	6
§ 1.3 Lie rings	9
§ 1.4 Mappings, homomorphisms, automorphisms	15
§ 1.5 Group actions on a set	15
§ 1.6 Fixed points of automorphisms	17
§ 1.7 The Jordan normal form of a linear transformation of finite order	20
§ 1.8 Varieties and free groups	22
§ 1.9 Groups with operators	24
§ 1.10 Higman's Lemma	25
<i>Chapter 2</i>	
Nilpotent groups	30
§ 2.1 Commutators and commutator subgroups	30
§ 2.2 Definitions and basic properties of nilpotent groups	34
§ 2.3 Some sufficient conditions for soluble groups to be nilpotent	37
§ 2.4 The Schur-Baer Theorem and its converses	43
§ 2.5 Lower central series. Isolators	47
§ 2.6 Nilpotent groups without torsion	51
§ 2.7 Basic commutators and the collecting process	53
§ 2.8 Finite p -groups	59
<i>Chapter 3</i>	
Associated Lie rings	70
§ 3.1 Results on Lie rings analogous to theorems about groups	71
§ 3.2 Constructing a Lie ring from a group	73

§ 3.3	The Lie ring of a group of prime exponent	78
§ 3.4	The nilpotency of soluble Lie rings satisfying the Engel condition	81

Part II Automorphisms 85

Chapter 4

	Lie rings admitting automorphisms with few fixed points	87
§ 4.1	Extending the ground ring	87
§ 4.2	Regular automorphisms of soluble Lie rings	90
§ 4.3	Regular automorphisms of Lie rings	94
§ 4.4	Almost regular automorphisms of prime order	102
§ 4.5	Comments	117

Chapter 5

	Nilpotent groups admitting automorphisms of prime order with few fixed points	121
§ 5.1	Regular automorphisms of prime order	121
§ 5.2	Nilpotent p -groups with automorphisms of order p	123
§ 5.3	Nilpotent groups with an almost regular automorphism of prime order	128
§ 5.4	Comments	148

Chapter 6

	Nilpotency in varieties of groups with operators	155
§ 6.1	Preliminary lemmas	157
§ 6.2	A nilpotency theorem	161
§ 6.3	A local nilpotency theorem	164
§ 6.4	Corollaries	174
§ 6.5	Comments	177

Chapter 7

	Splitting automorphisms of prime order and finite p-groups admitting a partition	180
§ 7.1	The connection between splitting automorphisms of prime order and finite p -groups admitting a partition	181
§ 7.2	The Restricted Burnside Problem for groups with a splitting automorphism of prime order	185
§ 7.3	The structure of finite p -groups admitting a partition and a positive solution of the Hughes problem	202
§ 7.4	Bounding the index of the Hughes subgroup	208

§ 7.5	Comments	216
-------	----------	-----

Chapter 8

Nilpotent p-groups admitting automorphisms of order p^k with few fixed points	226
--	-----

§ 8.1	An application of the Mal'cev correspondence	227
-------	--	-----

§ 8.2	Powerful p -groups	232
-------	----------------------	-----

§ 8.3	A weak bound for the derived length	234
-------	-------------------------------------	-----

§ 8.4	A strong bound for the derived length of a subgroup of bounded index	236
-------	---	-----

References	240
------------	-----

Index of names	248
----------------	-----

Subject Index	250
---------------	-----