CONTENTS

Chapter 1	Preliminaries
1.1 1.2 1.3 1.4	Sets and functions . Partial and total orderings; equivalence relations . Cardinality . Groups
Chapter 2	Metric Spaces
2.1 2.2 2.3 2.4 2.5 2.6 2.7	The notion of a metric space
Chapter 3	Topologies
3.1 3.2 3.3 3.4 3.5 3.6	The notion of a topology
Chapter 4	Derived Topological Spaces. Continuity
4.1 4.2 4.3 4.4 4.5 4.6	Subspaces 64 The topologically derived sets in subspaces 65 Continuity 70 Homeomorphisms 75 Identification spaces 79 Product spaces 84

x Contents

Chapter 5	The Separation Axioms
5.1	T_0 - and T_1 -spaces
5.2	T_2 -spaces
5.3	T_3 - and regular spaces
5.4	T_4 - and normal spaces
5.5	Normality and the extension of functions 106
Chapter 6	Convergence
6.1	The need for a generalized notion of convergence 113
6.2	Nets
6.3	Subsequences and subnets
6.4	Convergence of nets
6.5	Limit points
6.6	Continuity and convergence
6.7	Filters
6.8	Ultranets and ultrafilters
Chapter 7	Covering Properties
•	•
7.1	open covers and remements.
7.2	outstanding properties
7.3	Compactness
7.4	The derived spaces and compactness. The separation axioms and compactness
	•
Chapter 8	More About Compactness
8.1	Compactness in \mathbb{R}^n
8.2	Local compactness
8.3	Compactifications
8.4	Sequential and countable compactness
Chapter 9	Connectedness
9.1	The notion of connectedness
9.2	Further tests for connectedness
9.3	Connectedness and the derived spaces
9.3	7
9.5	Connectedness and compact T_2 -spaces
Chapter 10	Metrizability. Complete Metric Spaces
10.1	Metrizable spaces
10.2	Cauchy sequences
10.3	Complete metric spaces
10.4	Baire category theorem
10.5	Paracompactness. Complete Regularity

хi