
Contents

Preface	v
Introduction	1
1 Set Theory	5
1.1 Sets and Functions	5
1.2 Cardinals	13
1.3 Cartesian Products	17
Remarks	21
2 Metric Spaces	23
2.1 Definitions and Examples	23
2.2 Open and Closed Sets	28
2.3 Convergence and Continuity	34
2.4 Completeness	40
2.5 Compactness for Metric Spaces	52
Remarks	59
3 Set-Theoretic Topology	61
3.1 Topological Spaces—Definitions and Examples	61
3.2 Continuity and Convergence of Nets	72
3.3 Compactness	79
3.4 Connectedness	89
3.5 Separation Properties	100
Remarks	107
4 Systems of Continuous Functions	109
4.1 Urysohn’s Lemma and Applications	109
4.2 The Stone–Čech Compactification	116
4.3 The Stone–Weierstraß Theorems	121
Remarks	129

5	Basic Algebraic Topology	133
5.1	Homotopy and the Fundamental Group	133
5.2	Covering Spaces	148
	Remarks	154
A	The Classical Mittag-Leffler Theorem	
	Derived from Bourbaki's	157
B	Failure of the Heine–Borel Theorem	
	in Infinite-Dimensional Spaces	161
C	The Arzelà–Ascoli Theorem	165
	References	169
	Index	171



<http://www.springer.com/978-0-387-25790-7>

A Taste of Topology

Runde, V.

2005, X, 177 p., Softcover

ISBN: 978-0-387-25790-7