Introduction					xiii
--------------	--	--	--	--	------

Part I Preliminaries

1	\mathbf{Set}	Theory
	1.1	Axioms of Set Theory
	1.2	Ordered sets
	1.3	Ordinal numbers
	1.4	Sets of ordinal numbers
	1.5	Cardinality of ordinal numbers
	1.6	Transfinite induction
	1.7	The Zermelo theorem
	1.8	Lemma of Kuratowski-Zorn
2	Тор	ology
	2.1	Category
	2.2	Baire property
	2.3	Borel sets
	2.4	The space 3
	2.5	Analytic sets
	2.6	Operation A
	2.7	Theorem of Marczewski
	2.8	Cantor-Bendixson theorem
	2.9	Theorem of S. Piccard
3	Mea	sure Theory
	3.1	Outer and inner measure
	3.2	Linear transforms
	3.3	Saturated non-measurable sets
	3.4	Lusin sets
	3.5	Outer density
	3.6	Some lemmas

	3.7	Theorem of Steinhaus
	3.8	Non-measurable sets
4	Alge	ra
	4.1	inear independence and dependence
	4.2	Bases
	4.3	Homomorphisms
	4.4	Cones
	4.5	Groups and semigroups
	4.6	Partitions of groups
	4.7	Rings and fields
	4.8	Algebraic independence and dependence
	4.9	Algebraic and transcendental elements
	4.10	Algebraic bases
	4.11	Simple extensions of fields
	4.12	(somorphism of fields and rings

Part II Cauchy's Functional Equation and Jensen's Inequality

5	Addi	tive Functions and Convex Functions	
	5.1	Convex sets	
	5.2	Additive functions	
	5.3	Convex functions	
	5.4	Homogeneity fields	
	5.5	Additive functions on product spaces	
	5.6	Additive functions on C	
6	Elen	nentary Properties of Convex Functions	
	6.1	Convex functions on rational lines	
	6.2	Local boundedness of convex functions	
	6.3	The lower hull of a convex functions	
	6.4	Theorem of Bernstein-Doetsch	
7	Cont	inuous Convex Functions	
	7.1	The basic theorem	
	7.2	Compositions and inverses	
	7.3	Differences quotients	
	7.4	Differentiation	
	7.5	Differential conditions of convexity	
	7.6	Functions of several variables	
	7.7	Derivatives of a function	
	7.8	Derivatives of convex functions	
	7.9	Differentiability of convex functions	
	7.10	Sequences of convex functions	

8	Inequ	ualities
	8.1	Jensen inequality
	8.2	Jensen-Steffensen inequalities
	8.3	Inequalities for means
	8.4	Hardy-Littlewood-Polya majorization principle.
	8.5	Lim's inequality
	8.6	Hadamard inequality
	8.7	Petrovic inequality
	8.8	Mulholland's inequality
	8.9	The general inequality of convexity
9	Bour	ndedness and Continuity of Convex Functions and Additive Functions
	9.1	The classes A,B,C
	9.2	Conservative operations
	9.3	Simple conditions
	9.4	Measurability of convex functions
	9.5	Plane curves
	9.6	Skew curves
	9.7	Boundedness below
	9.8	Restrictions of convex functions and additive functions
10	The	Classos A B C
10	10.1	A Hahn-Banach theorem 257
	10.1	The class B 260
	10.2	The class C 266
	10.0	The class A 267
	10.5	Set-theoretic operations 269
	10.6	The classes D 271
	10.7	The classes A_c and B_c
11	Duor	portion of Hamal Based
11	11 1	Concept properties 991
	11.1	Measure 289
	11.2	Topological proporties 995
	11.0	Puretin bases
	11.4	Endos sots
	11.0	Lucipaeta
	11.0	Dusinsets.
	11.7	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
	11.8	Ine operations κ and U

12 Further Properties of Additive Functions and Convex Functions					
12.1 Graphs					.305
12.2 Additive functions					.308
12.3 Convex functions					.313
12.4 Big graph	•	•	•	•	.316
12.5 Invertible additive functions			•	•	.322
12.6 Level sets	•			•	.327
12.7 Partitions					.330
12.8 Monotonicity					.335

Part III Related Topics 13 Related Equations

13 Related Equations	
13.1 The remaining Cauchy equations	3
13.2 Jensen equation	1
13.3 Pexider equations	5
13.4 Multiadditive functions	3
13.5 Cauchy equation on an interval	7
13.6 The restricted Cauchy equation	9
13.7 Hosszu equation	4
13.8 Mikusiriski equation	6
13.9 An alternative equation	0
13.10The general linear equation	2
14 Derivations and Automorphisms	
14.1 Derivations	1
14.2 Extensions of derivations	4
14.3 Relations between additive functions	9
14.4 Automorphisms of R	2
14.5 Automorphisms of C	3
14.6 Non-trivial endomorphisms of C	6
15 Convex Functions of Higher Orders	
15.1 The difference operator	5
15.2 Divided differences	1
15.3 Convex functions of higher order	ŝ
15.4 Local boundedness of p-convex functions	2
15.5 Operation H	5
15.6 Continuous p-convex functions	g
15.7 Continuous p-convex functions. Case $N = 1. \ldots \ldots \ldots \ldots 44$	2
15.8 Differentiability of p-convex functions.	4
15.9 Polynomial functions	-6

16 Subadditive Functions
16.1 General properties
16.2 Boundedness. Continuity
16.3 Differentiability
16.4 Sublinear functions
16.5 Norm
16.6 Infinitary subadditive functions
17 Nearly Additive Functions and Nearly Convex Functions
17.1 Approximately additive functions
17.2 Approximately multiadditive functions
17.3 Functions with bounded differences
17.4 Approximately convex functions
17.5 Set ideals
17.6 Almost additive functions
17.7 Almost polynomial functions
17.8 Almost convex functions
17.9 Almost subadditive functions
18 Extensions of Homomorphisms
18.1 Commutative divisible groups 535
18.2 The simplest case of S generating X . 537
18.3 A generalization 540
18.4 Further extension theorems 546
18.5 Cauchy equation on a cylinder 551
18.6 Cauchy nucleus 556
18.7 Theorem of Ger
18.8 Inverse additive functions
18.9 Concluding remarks
Bibliography
Indicos
Indices
Index of Symbols
Subject Index
Index of Names