## **CONTENTS**

Introduction		
1.	Operator Equations and Inverse Problems	3
1.1	Definition of Quasimonotonicity, the Uniqueness Theorem	3
1.2	Inverse Problems for Hyperbolic Equations	5
1.3	Multidimensional Inverse Kinematic Problem of Seismics	7
1.4	On the Uniqueness of the Solution of the Fredholm and	
	Volterra First Kind Integral Equations	9
1.5	On the Uniqueness of the Solution of Integral Equations	
	of the First Kind with Entire Kernel	14
1.6	Existence and Uniqueness of a Solution to an Inverse Problem	
	for a Parabolic Equation	18
1.7	On Unique Solvability of an Inverse Problem for a	
	Parabolic Equation	21
1.8	Formulas in Multidimensional Inverse Problems for	
	Evolution Equations	25
2.	Inverse Problems for Kinetic Equations	29
2.1	Kinetic Equations	29
2.2	An Example of an Inverse Problem for Kinetic Equation	31
2.3	One-dimensional Inverse Problems	31
2.4	Multidimensional Inverse Problems	33
2.5	An Uniqueness Theorem for the Solution of an Inverse Problem	
	for a Kinetic Equation	35
2.6	The General Uniqueness Theorem	37
2.7	The Effect of the 'Redundant' Equation	43
2.8	Problem of Separation	46
2.9	Differential and Integro-differential Identities	47
2.10	Solution Existence Problems	49
2.11	An Inverse Problem of Mathematical Biology	53
3.	Geometry of Convex Surfaces in the Large and Inverse	
	Problems of Scattering Theory	58
3.1	Geometrical Question of Scattering Theory	58
3.2	Integral Equation of the First Kind	63
3.3	Uniqueness	74
3.4	Existence	81
3.5	Stability	84

vi contents

4.	Integral Geometry	86
4.1	Inversion Formulas	87
4.2	The Uniqueness and Solvability	91
4.3	Some Applications	97
4.4	The Structure of Riemann Spaces and Problems of the	
	Integral Geometry	101
4.5	The Solvability of a Problem in Integral Geometry by	
	Integration along Geodesics	116
References		125