Table of Contents

Preface	vii
Preliminaries	1
CHAPTER I. Integral Representations and the Logarithmic Residue	15
1. The Martinelli-Bochner integral representation	15
2. Multiplicity of a zero of a holomorphic mapping. The Rouché principle	18
3. The fundamental integral formula of Leray and Koppelman	25
4. The Cauchy formula. The logarithmic residue with respect to	
the skeleton	30
5. The Andreotti-Norguet formula and generalizations of it	38
6. The Bergman kernel function, the Szegö kernel, and integral representations with a holomorphic kernel on the Shilov bound-	
ary	42
 The Martinelli-Bochner-Koppelman integral representation for exterior differential forms 	49
CHAPTER II. Integral Representations of Special Form for Holomor-	
phic Functions	59
8. Modifications and the simplest particular cases of the Leray	
formula	59
9. The Bergman-Weil formula	65
10. Integral representation for strictly pseudoconvex domains	66
11. Integral formulas for functions holomorphic in n-circular do-	
mains	73
12. The Schwarz kernel and integral representations of holomorphic	
functions with nonnegative real part	80
CHAPTER III. The Theory of Residues	93
13. Statement of the problem	93
14. Application of Alexander-Pontryagin duality	94
15. Application of de Rham duality	98

16. The Leray theory of residues	101
17. Cohomological reduction of certain semimeromorphic and ra-	
tional forms	113
18. Residues of rational functions of two variables	119
19. Local residues of certain meromorphic and rational functions in \mathbb{C}^n	129
CHAPTER IV. Applications to Implicit Functions, Systems of Non-	
linear Equations, Computation of the Multiplicity of a Zero, and	
Combinatorics	137
20. Expansion of implicit functions in power series and function series	137
21. Application of the multidimensional logarithmic residue to systems of nonlinear equations	157
22. Computation of the multiplicity of a zero of a system of holomorphic functions from their Taylor series	175
23. Application of multiple residues for finding generating functions and computing combinatorial sums	188
CHAPTER V. Some Applications in Multidimensional Complex	
Analysis	195
24. The Hartogs-Bochner theorem on necessary analytic extension. Approximation of holomorphic functions on Weil polyhedra and linearly convex compact sets	195
25. The ∂-problem and Oka's theorems	20 4
26. Forms orthogonal to holomorphic functions. Lewy's equation. General form of integral representation formulas for holomor-	010
phic functions	219
27. A basis in the space of holomorphic functions with fixed algebraic singularities	241
Brief historical notes	249
Bibliography	259
Subject index	279
Index of notation	283