CONTENTS

Chapter 1	The Concept of an Analytic Function	
§1 §2 §3	The complex numbers	1 8 10
Chapter 2	General Properties of Rational Functions	10
-		
§1	The <i>n</i> -th power	23
§2	Polynomials	29
§3	Rational functions	31
Chapter 3	Linear Transformations	
§ 1	Basic properties of linear transformations	37
§2	Mapping problems	45
§ 3	Stereographic projection	52
Chapter 4	Mapping by Rational Functions of Second Order	60
Chapter 5	The Exponential Function and its Inverse. The General Power	
§ 1	Definition and basic properties of the exponential function	65
§ 2	Mapping by means of the exponential function. The logarithm.	70
§3	The general power	73
Chapter 6	The Trigonometric Functions	
§1	The sine and cosine	78
§2	The tangent and the cotangent	82
§3	The mappings given by the functions $\tan z$ and $\cot z$. Their inverse	
	functions	85
§4	The mappings given by the functions $\sin z$ and $\cos z$. The functions	
	$\arcsin z$ and $\arccos z$	87
§5	Survey of the Riemann surfaces of the elementary functions	91
Chapter 7	Infinite Series with Complex Terms	
§ 1	General theorems	95
§2	Power series	100
=	::	

Chapter	8	Integration in the Complex Domain. Cauchy's Theorem	m			
	§1	Complex line integrals		_		108
	§2	perturbation of the second of				114
	§3	Cauchy's theorem	•	•	•	117
	§4	The general formulation of Cauchy's theorem.	•	•	•	
	٠.	The general formulation of Cadeny's theorem.	•	•	•	141
Chapter	9	Cauchy's Integral Formula and its Applications				
	§1	Cauchy's formula				131
1	§ 2	The Taylor expansion of an analytic function				135
	§3	Consequences of Cauchy's integral formula				138
	§4	PPI - T				146
	§5	T. 1., 1 1 1 1 C 1 . C				149
	§6	The impress of an analytic Count		•		155
	§7			•	•	162
	§8	Normal Families			•	165
	80	Normal Lammes		•	•	10,
Chapter	10	The Residue Theorem and its Applications				
	§1	The residue theorem				167
	§2	Application of the residue theorem to the evaluation	of c	lefin	ite	
		integrals				169
	§3			•	Ċ	173
	§4	771				175
	§5	A 31 C.1				177
Chapter :	11	Harmonic Functions				
_		Dustinainama annidanationa				40
	§1	Preliminary considerations		٠	. •	184
'	§2	Gauss's mean-value theorem. The maximum and mini	mur	n pr	ın-	
		ciples			•	191
	§3	Poisson's formula				195
	§4					197
	§5	The Dirichlet problem				204
	§6	Harnack's principle		٠		206
Chapter	12	Analytic Continuation				
	§ 1	The principle of analytic continuation				212
	§2	The monodromy theorem	•	•	٠	213
	§3	The inverse of a rational function	•			216
	§3 §4	L'armania annimantia Til G	•		٠	217
,	34	Harmonic continuation. The reflection principle	•	٠	٠	219
Chapter	13	Entire Functions				
	§1	Infinite products				225
	§2	Product representation of the function $w = \sin \pi z$.	•	•	•	
	§3	The Weierstrass factorization theorem	•	•	•	231
	84	Jensen's formula The growth of entire functions	•	•	•	236

Chapter 14	Periodic Functions
§1	Definitions of simply and doubly periodic functions
§2	Reduction of simply periodic functions to the exponential function
§3	The basic properties of doubly periodic functions
§4	The Weierstrass \wp -function
§5	The Weierstrass ζ - and σ -functions
§6	Representation of doubly periodic functions by means of the
	σ -function
§7	The differential equation of the function $\varphi(z)$
§8	Representation of doubly periodic functions as rational functions
	of φ and φ'
§9	Addition theorem for doubly periodic functions
§10	Determination of a doubly periodic function with prescribed
	principal parts
§11	Mapping by a doubly periodic function of order 2
§12	Elliptic integrals
Chapter 15	The Euler Γ-Function
§1	Definition of the Γ -function
§2	Stirling's formula
§3	The product representation of the Γ -function
Chapter 16	The Riemann ζ-Function
§1	Definition and the Euler product formula
§2	Integral representation of the ζ -function
§3	Analytic continuation of the ζ-function
§4	Riemann's functional equation
§5	The zeros of the ζ -function and the distribution of prime numbers
v	
Chapter 17	The Theory of Conformal Mapping
§1	The Riemann mapping theorem
§2	Construction of the solution
§3	Boundary correspondence under conformal mapping
§4	The connection between conformal mapping and the Dirichlet
3.	problem
§ 5	The conformal mapping of polygons
§6	Triangle functions
§0 §7	The Picard theorem
2,	The real discovery
	Inday