TABLE OF CONTENTS

INDEX OF NOTATIONS ix

INTRODUCTION

(a) *Some general remarks* 3

(b) *General references and background material* 5

The prerequisites and references for these notes, some notations and terminology, and the Wirtinger theorem.

CHAPTER 1: ORDERS OF GROWTH

(a) *Some heuristic comments* 8

Emile Borel's proof, based on the concept of growth, of the Picard theorem, and the classical Jensen theorem are discussed.

(b) *Order of growth of entire analytic sets* 11

The counting function, which measures the growth of an analytic set $V \subset \mathbb{C}^n$, is defined and some elementary properties are derived. Stoll's theorem characterizing algebraic hypersurfaces in terms of growth is proved.

(c) *Order functions for entire holomorphic mappings* 17

The order function $T_f(L,r)$, which measures the growth of an entire holomorphic mapping $f: \mathbb{C}^n \to M$ relative to a positive line bundle $L \to M$, is defined and the first main theorem (1.15) proved. Crofton's formula is used to give a geometric interpretation of $T_f(L,r)$, and is then combined with Stoll's theorem to give a characterization of rational maps.

(d) *Classical indicators of orders of growth* 25

The Ahlfors-Shimizu and Nevanlinna characteristic functions, together with the maximum modulus indicator, are defined and compared. Borel's proof of the Picard theorem is completed.

(e) *Entire functions and varieties of finite order* 30

Weierstrass products and the Hadamard factorization theorem are discussed. The Lelong-Stoll generalization to divisors in $\mathbb{C}^n$ is then proved.

CHAPTER 2: THE APPEARANCE OF CURVATURE

(a) *Heuristic reasoning* 40
It is shown that curvature considerations arise naturally in trying to measure the ramification of an entire meromorphic function. The use of negative curvature is illustrated.

(b) *Volume forms* 46
Volume forms and their Ricci forms are introduced and some examples given. The main construction of singular volume forms is presented.

(c) *The Ahlfors lemma* 53
The ubiquitous Ahlfors lemma is proved and applications to Schottky-Landau type theorems are given, following which appears a value distribution proof of the Big Picard Theorem.

(d) *The Second Main Theorem* 59
The main integral formula (2.29) and subsequent basic estimate (2.30) concerning singular volume forms on $C^n$ are derived.

CHAPTER 3: THE DEFECT RELATIONS

(a) *Proof of the defect relations* 65
The principal theorem 3.4 and some corollaries are proved.

(b) *The lemma on the logarithmic derivative* 70
A generalization of R. Nevanlinna's main technical estimate is demonstrated by curvature methods.

(c) *R. Nevanlinna's proof of the defect relation 3.10* 73
Nevanlinna's original argument and an illustrative example are discussed.

(d) *Ahlfors' proof of the defect relation 3.10* 79
This is the second of the classical proofs of the Nevanlinna defect relation for an entire meromorphic function.

(e) *Refinements in the classical case* 81
There are many refinements of the general theory in the special case of entire meromorphic functions of finite order. We have chosen one such, due to Erdrei and Fuchs, to illustrate the flavor of some of these results.

BIBLIOGRAPHY 97