

Chapter VI. The Maximum Modulus Theorem Study Guide

The following is a brief list of topics covered in Chapter VI of Conway's *Functions of One Complex Variable*, 2nd edition. This list is not meant to be comprehensive, but only gives a list of several important topics. You should also carefully study the proofs given in class and the homework problems.

VI.1. The Maximum Principle.

The Maximum Modulus Theorem Second Version (Theorem VI.1.2), limit superior and limit inferior of a function, the Maximum Modulus Theorem Third Version (Theorem VI.1.4), the Maximum Modulus Theorem for Unbounded Domains.

Section VI.2. Schwarz's Lemma.

Schwarz's Lemma (Lemma VI.2.1), Möbius transformation φ_a , Properties of φ_a (Proposition VI.2.2), classification of the one to one and onto analytic mappings of the unit disk to itself (Proposition VI.2.5), Generalized Schwarz's Lemma 1, Generalized Schwarz's Lemma 2 (due to Govil, Rahman, and Schmeisser).

Section VI.3. Convex Functions and Hadamard's Three Circles Theorem.

Convex function and convex set, classification of convex functions and sets (Propositions VI.3.2 and VI.3.3), logarithmically convex, conditions for logarithmic convexity (Theorem VI.3.7), Hadamard's Three Circles Theorem (Theorem VI.3.13).

Section VI.4. Phragmén-Lindelöf Theorem.

The Phragmén-Lindelöf Theorem (Theorem VI.4.1), corollaries to the Phragmén-Lindelöf Theorem (Corollaries VI.4.2 and VI.4.4).

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