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Sommario/riassunto

This book contains all the exercises and solutions of Serge Lang's Complex Analy- sis. Chapters I through VITI of Lang's book contain the material of an introductory course at the undergraduate level and the reader will find exercises in all of the fol- lowing topics: power series, Cauchy's theorem, Laurent series, singularities and meromorphic functions, the calculus of residues, conformal mappings and har- monic functions. Chapters IX through XVI, which are suitable for a more advanced course at the graduate level, offer exercises in the following subjects: Schwarz re- flection, analytic continuation, Jensen's formula, the Phragmen-LindelOf theorem, entire functions, Weierstrass products and meromorphic functions, the Gamma function and the Zeta function. This solutions manual offers a large number of worked out exercises of varying difficulty. I thank Serge Lang for teaching me complex analysis with so much enthusiasm and passion, and for giving me the opportunity to work on this answer book. Without his patience and help, this project would be far from complete. I thank my brother Karim for always being an infinite source of inspiration and wisdom. Finally, I want to thank Mark McKee for his help on some problems and Jennifer Baltzell for the many years of support, friendship and complicity. Rami Shakarchi Princeton, New Jersey 1999 Contents Preface vii I Complex Numbers and Functions 1 1. 1 Definition . . . . . 1 1. 2 Polar Form . . . . . 3 1. 3 Complex Valued Functions . 8 1. 4 Limits and Compact Sets . . 9 1. 6 The Cauchy-Riemann Equations .