PREFACE

R. P. Langlands presented a course on class field theory at Princeton University during the spring of 1964. The contents of chapters II through XII are the notes from those lectures. Chapter I contains a brief summary of prerequisite material, distilled from an introductory course on algebraic number theory by Langlands during the preceeding fall; only the things needed for class field theory have been included.

Chapters II through V contain a proof on the first fundamental theorem modulo the two fundamental inequalities. Chapter VI covers the compactness of the idele class group and the unit theorem; this was covered in the above mentioned fall course, but it seemed desirable to include detailed proofs.

Chapters VII and VIII contain proofs of the fundamental inequalities. The proof of the first fundamental theorem is complete at this point. The Kronecker theorem that every abelian extension of the rationals is contained in a cyclotomic extension is proved in chapter XI.

Chapter XI on the norm residue symbol covers the first fundamental theorem of local class field theory, and proofs of the quadratic reciprocity laws for both rational integers and Gaussian integers. Chapter XII contains an explicit computation of the norm residue symbol for Kummer extensions, and a proof of the p-th power reciprocity law of Takagi. Chapter XII contains a proof of the second fundamental theorem.

I have omitted any discussion of function fields. The only mention of them in the original lectures was in proposition 3.5, which required an independent proof for function fields in one variable over a finite field. In any case, proofs of the first and second fundamental inequalities were given only for algebraic number fields.

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