

COMPLEX MULTIPLICATION

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The aim is to construct explicitly the maximal abelian extension of a quadratic imaginary field K . One gets it adjoining to the field K (almost in some precise sense) the coordinates of all torsion points of an elliptic curve, whose ring of automorphism is the ring of algebraic integers in K . In the case of the field of rational numbers one gets the maximal abelian extension of \mathbb{Q} adjoining to the field \mathbb{Q} all roots of unity (torsion points of the complex multiplicative group). During the preparation you will learn the important subject of number theory (the class field theory) and the elliptic curves and modular forms.