Class Field Theory: The Kronecker-Weber Theorem

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Abstract

We sketch a proof of the Kronecker-Weber theorem and explain how it can be interpreted as the class field theory for $\mathbb{Q}$.

1 Introduction

Recommended references:[3],[1],[4],[2].

The logic of a complete proof is sketched in [3]. The algebraic number-theoretic details were proved explicitly in Daniel Lupp's bachelor's thesis([4]). They can be compared with the bachelor's thesis of [1]. Some structural results about cyclotomic fields that cannot be avoided in all of them were listed in the second note of our meeting, whose proofs can be found in 14.5 of [2].

References

[1] Romain Branchereau. The kronecker-weber theorem. 2016.

[2] David Steven Dummit and Richard M Foote. *Abstract algebra*, volume 3. Wiley Hoboken, 2004.

[3] MJ Greenberg. An elementary proof of the kronecker-weber theorem. *The American Mathematical Monthly*, 81(6):601–607, 1974.

[4] Daniel Lupp. A simple proof of the kronecker-weber theorem. 2011.