# Report on Bára Tížková's master thesis: "Adèles and class fields"

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## 1 Summary of the content

In this thesis, Bára Tížková describes the introduction to a very difficult area of number theory, class field theory. Two different approaches are presented in the thesis, the classical one, and a more modern one from the mid-20th century by Chevalley. After the brief introduction of the necessary notions in algebraic number theory, the ring of adèles and the group of idèles are very well explained in Chapter 2. In Chapter 2, Bára presented her proofs of many useful properties even though there are enough proofs in the literature, which shows her dedication to this thesis. In Chapter 3, the study of class field theory is nicely motivated and then explained in detail: starting from abelian extensions of $\mathbb{Q}$, then the unramified abelian extensions, and the general ones. The key tools, the Artin maps and reciprocity laws are explained in each of the cases. I especially appreciate the effort to create the table on page 50, which explains the differences between the aforementioned cases. Finally, in Chapter 4, the content of Chapter 3 is presented using a different language, of idèles, concluding with the Artin reciprocity law in this setting.

## 2 Evaluation - Excellent, propose maximal grade

Bára Tížková showed great understanding of the subject, also by including her own ideas and proofs of the known statements, in particular, I would like to emphasise the proofs of Lemma 3.23 and 3.32. There are no publishable research results, which is completely understandable, given the difficulty of the topic that was chosen for this master thesis. I am confident that Bára has learned a lot of mathematics. I would also like to point out that she demonstrated excellent writing skills, despite a few minor inaccuracies, which of course, does not diminish the overall impression of this great master thesis, and hence I recommend the maximal grade for Bára.