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Introduction to Algebraic Number Theory

Sheet 9

Exercise 1. For the following number fields, find the fundamental unit and its norm.

- (a) $\mathbb{Q}(\sqrt{17})$
- (b) $\mathbb{Q}(\sqrt{39})$
- (c) $\mathbb{Q}(\sqrt{53})$

Exercise 2. Let $K = \mathbb{Q}(\sqrt{a}, \sqrt{b})$ be a number field of degree 4 over \mathbb{Q} . Show that the group μ_K of roots of unity in K has size 2, 4, 6, 8 or 12, and that all these values occur.