

On the arithmetic of orders in algebraic number fields

Balint Rago

University of Graz

E-mail: `balint.rago@uni-graz.at`

We give an overview of the arithmetic of orders in algebraic number fields. Let K be a number field with ring of integers \mathcal{O}_K and let \mathcal{O} be an order in K . From a factorization-theoretical viewpoint, \mathcal{O} behaves similarly to the Dedekind domain \mathcal{O}_K , where the arithmetic is well-understood via the ideal class group. The main differences are due to a finite number of irregular prime ideals of \mathcal{O} , namely the prime ideals that contain the conductor of \mathcal{O} .

We call \mathcal{O} half-factorial if every factorization into irreducibles of a given element has the same number of factors. We will give an algebraic characterization of half-factorial orders, which depends on the localizations $\mathcal{O}_{\mathfrak{p}}$ for the irregular prime ideals \mathfrak{p} .