# NUMBER FIELDS

ADAM KELLY – MATHEMATICAL TRIPOS PART II

## 1. Ideals

(1) (Ideal norm). Let $I$ be an ideal of $\mathcal{O}_K$. We say $N(I) = [\mathcal{O}_K : I]$ is the **ideal norm** of $I$.
(2) Let $K$ be a number field with $n = [K : \mathbb{Q}]$, and let $I \leq \mathcal{O}_K$ be a non-zero ideal. Then $I = \bigoplus_{i=1}^{n} \mathbb{Z}\alpha_i$ for some linearly independent $\alpha_i \in I$, and $[\mathcal{O}_K : I]^2 = \operatorname{disc}(I)/d_K$.

*Date*: May 30, 2023. Email ak2316@cam.ac.uk.