Topology and the Classgroup

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Abstract

Let K be a finite extension of $\mathbb{Q}$ with ring of integers R, let $\mathcal{F}(R)$ denote the group of fractional ideals over R, and let $\mathcal{PF}(R)$ denote the subgroup of principal fractional ideals. The classgroup of R is defined as the quotient group $\mathcal{C}(R) = \mathcal{F}(R)/\mathcal{PF}(R)$. An important result in algebraic number theory says that $\mathcal{C}(R)$ is finite. In this talk we outline J. W. S. Cassels' proof of this fact which uses some elementary topology and the theory of adeles and ideles.