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Title:	A Study of Quadratic Number Fields
Authors:	Tinani, Simran (/jspui/browse?type=author&value=Tinani%2C+Simran)
Keywords:	Quadratic Number Fields and Galois Theory Factorization of the Class Number
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Abstract:	The goal of this project is to form an understanding of quadratic number fields of both positive and negative discriminants $D$ , and in particular, their class groups. We begin by establishing a correspondence between the ideal class group and the form class group, which consists of equivalence classes of binary quadratic forms. We further explore Gauss's class number problems and use the correspondence established to compute class numbers for different values of the discriminant $D$ , and to derive other results about the structure of the ideal class group. We then look at the splitting of prime ideals in field extensions of a Dedekind domain, and then apply this theory specifically to prime numbers in $\mathbb{Q}$ to obtain their prime ideal factorizations in quadratic number fields. The theory of ramification of prime numbers is then used as background knowledge to further study the ideal class group, and derive various results on the class number. In particular, unramified field extensions are studied in detail. The Hilbert class field is briefly introduced.
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