

Title: On the p -divisibility of class numbers of an infinite family of imaginary quadratic fields

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Abstract

The ideal class group of a number field K is defined to be the quotient group J_K/P_K , where J_K is the group of fractional ideals of K and P_K is the group of principal fractional ideals of K . It is denoted by Cl_K . It is well known that Cl_K is finite. The class number h_K of a number field K is the order of Cl_K . The ideal class group is one of the most basic and mysterious objects in algebraic number theory. The divisibility properties of the class numbers of number fields play a very important role in understanding the structure of the ideal class groups of number fields. K. Chakraborty and A. Hoque has proved the class number of $\mathbb{Q}(\sqrt{1-2m^3})$ is divisible by 3 for any odd integer $m > 1$. We prove a similar result for all odd primes p , as a corollary. For any odd prime p , we construct an infinite family of pairs of imaginary quadratic fields $\mathbb{Q}(\sqrt{d}), \mathbb{Q}(\sqrt{d+1})$ whose class numbers are both divisible by p . This settles Iizuka's conjecture for the case $n = 1$ and $p > 2$. We shall discuss this problem in this talk.

This is joint work with Dr. SriLakshmi Krishnamoorthy.