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Divisibility by 16 of class number of quadratic fields whose 2-class groups are cyclic. (English)

Zbl 0535.12002
Osaka J. Math. 21, 1-22 (1984).

Let $K = \mathbb{Q}(\sqrt{D})$ be the quadratic field with discriminant D. The strict class number of K is denoted by $h^+(D)$. In this paper the author considers those fields K for which $|D|$ has just two distinct prime divisors so that the Sylow 2-subgroup of the strict ideal class group of K is cyclic. Using class field theory he derives conditions for $h^+(D)$ to be divisible by 16. One of the author's results is the following: if q is a prime $\equiv 1(mod 8)$ such that $8|h(-4q)$ then $16|h(-4q)$ if and only if $T \equiv q-1(mod 16)$, where $T+U\sqrt{q}>1$ is the fundamental unit of $\mathbb{Q}(\sqrt{q})$. This theorem is due to the reviewer [Acta Arith. 39, 381-398 (1981; Zbl 0393.12008)]. Previously it had only been proved by analytic means.

Reviewer: K.S.Williams

MSC:

11R11 Quadratic extensions
11R23 Iwasawa theory

Cited in **2** Reviews
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Keywords:

quadratic field; strict class number

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