

Oesterlé, Joseph

Class numbers of imaginary quadratic fields. (Nombres de classes des corps quadratiques imaginaires.) (French) [Zbl 0551.12003](#)

Sémin. Bourbaki, 36e année, Vol. 1983/84, Exp. No. 631, Astérisque 121-122, 309-323 (1985).

[For the entire collection see [Zbl 0542.00005](#).]

The study of class numbers of imaginary quadratic fields is an old and beautiful subject with roots in Gauss' theory of binary quadratic forms. In the 1930s Heilbronn and Siegel established that there are only a finite number of imaginary quadratic fields with given class number. However these results were not effective.

In 1977 [Astérisque 41-42, 219–227 (1977; [Zbl 0355.12005](#))] *D. M. Goldfeld* initiated a new approach to these problems that has led to an effective solution of the class number problem. Goldfeld's result depended on the existence of a new form with rational coefficients and such that its L -series had a high order zero at 1. Such a form has recently been provided by the work of *B. Gross* and *D. Zagier* [C. R. Acad. Sci., Paris, Sér. I 297, 85–87 (1983; [Zbl 0538.14023](#))]. This paper is an exposition of the above work and presents a simplified proof of the result of Goldfeld.

Reviewer: [David Goss \(Columbus/Ohio\)](#)

MSC:

[11R11](#) Quadratic extensions

[11R29](#) Class numbers, class groups, discriminants

Cited in **3** Reviews
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