

MR2211775 (Review) 11D09 (11R29)

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Class groups and quadratic Diophantine equations. (English summary)

JP J. Algebra Number Theory Appl. **5** (2005), *no. 2*, 331–347.

In this paper the author proves two independent results. First, he gives a necessary and sufficient condition for the central norm in the simple continued fraction expansion of \sqrt{D} to be 16, where $D = 16c$ and $c > 16$ is an odd positive integer that is not a perfect square. This condition involves congruence relations on the trace of the fundamental unit of $\mathbb{Z}[\sqrt{c}]$; cf. Theorem 10.

Further, the author provides necessary and sufficient conditions for the class group of a wide variety of complex quadratic fields to have a cyclic subgroup of order $n > 1$, with generator of a specific form; cf. Theorem 12. The conditions to have such subgroups are very explicit and therefore easy to check.

The author concludes his article with some conjectures on the class number of a complex quadratic field.

Reviewed by *Hassan Oukhaba*

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