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The palindromic index—a measure of ambiguous cycles of reduced ideals without any ambiguous ideals in real quadratic orders. (English. English summary)
The goal of this article is to give an overview of the theory of ambiguous classes of ideals in real quadratic fields. In particular, a criterion is given for an arbitrary real quadratic order (not necessarily maximal) to have ambiguous cycles containing no ambiguous ideals. Such cycles are often referred to as weak ambiguous cycles. Let $I = [a, (b + \sqrt{\Delta})/2]$ be a reduced ideal in a real quadratic order. The palindromic index $p(I)$ is defined to be the index $j$ such that $I' = I_j$ where $I'$ is the conjugate of $I$ and $I_j$ is the ideal associated with the $j$th term of the continued fraction expansion of $(b + \sqrt{\Delta})/(2a)$. Then it is shown that $I$ is a weak ambiguous cycle if and only if $l(I)$ is even and $p(I)$ is odd, where $l(I)$ is the period length in the continued fraction expansion mentioned above. It is also shown that a real quadratic order contains weak ambiguous cycles if and only if its fundamental unit has norm 1 and its discriminant is a sum of two squares.

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