Construction of families of long continued fractions revisited.

(English. English summary)


This article surveys some techniques regarding the explicit construction of families of quadratic irrationals whose continued fractions have arbitrarily long period lengths. We have, for instance, Theorem 3.4, which states that if \( a, b, k \) are natural numbers such that \( a \equiv 1 \pmod{2b} \), then for \( D_k = \left( ba^k + \frac{a-1}{2b}\right)^2 + 2a^k \) the period length of the continued fraction expansion of \( \sqrt{D_k} \) is \( 4k + 2 \). Furthermore there are explicit formulas for the partial and complete quotients.

The author makes the point that such results may be based on a theorem of Perron that should be better known, as well as previous results of his own, which provide a framework within which to study this problem and are at the same time simpler and also more general than some other approaches currently being considered.

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