CORRIGENDA TO "CALCULATION OF THE REGULATOR OF \( \mathbb{Q}(\sqrt{D}) \) BY USE OF THE NEAREST INTEGER CONTINUED FRACTION ALGORITHM"

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Abstract. There are some minor errors in one of the algorithms and two of the tables in a paper by Williams and Buhr. These errors do not affect the major conclusions of the paper.

We present corrections to one of the algorithms and two of the tables in [1]. These corrections do not affect the major conclusions of the paper.

In the algorithm for computing the NICF of \( \sqrt{D} \) on the bottom half of page 373, when \( Q_k' < 0 \), \( T_k \) should be defined as
- If \( Q_k' + F + 1 \) is even, then \( T_k = d + \lfloor (|Q_k'| + F + 1)/2 \rfloor \).
- If \( Q_k' + F + 1 \) is odd, then \( T_k = 1 + d + \lfloor (|Q_k'| + F + 1)/2 \rfloor \).

\( R_{k+1}' \) should be defined as
- If \( Q_{k+1}' < 0 \) and \( Q_{k+1}' \) divides \( P_{k+1}' + T_{k+1} \) evenly, then \( R_{k+1}' = |Q_{k+1}'| \).
- Otherwise, \( R_{k+1}' \) is, as in [1], the remainder on dividing \( P_{k+1}' + T_{k+1} \) by \( Q_{k+1}' \).

Note that the formula for \( R_{k+1}' \) has to be used with \( k = -1 \) in order to set the value of \( R_0' \). In the other formulas in this algorithm \( k \geq 0 \). Also, \( P_{k+1}' = T_k - R_k' \).

The description of Table 1 in [1] should read, "In Table 1 we give the frequency of occurrence of each of these criteria for the NICF expansion of \( \sqrt{D} \) for each nonsquare \( 10 \leq D < M \)." Corrected values for the Table 1 in [1] are given in "Table 1 (with corrections)".

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
Condition & \( M = 10,000 \) & \( M = 100,000 \) & \( M = 1,000,000 \) & \( M = 10,000,000 \) \\
\hline
1 & 7,370 & 76,155 & 776,894 & 7,882,803 \\
2 & 880 & 9,698 & 101,347 & 1,032,817 \\
3 & 324 & 2,340 & 18,093 & 146,161 \\
4 & 785 & 6,819 & 60,702 & 552,135 \\
5 & 153 & 1,302 & 11,734 & 106,995 \\
6 & 382 & 3,363 & 30,224 & 275,920 \\
\hline
\end{tabular}
\caption{Table 1 (with corrections)}
\end{table}
The corrected Table 1 agrees with that in [1] for $M = 10,000$, but most of the values to 100,000 and to 1,000,000 in the corrected table are slightly different from those in [1]. We have added counts to 10 million.

In Table 2 of [1] each $\Theta$ should be $2\Theta$. For Case 6, the $\log(\sqrt{D} + |Q'_{\rho-1}/2|)$ in [1] should be $\log(\sqrt{D} - |Q'_{\rho-1}/2|)$.

REFERENCES


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