The Denominiators of the Eigenfunctions of $\int_0^\infty J_0(x-y)\,f(x)\mathrm{d}x$ is Sequence A127752 in the OEIS

Matrix Definition

The matrix A associated with sequence A127752 is defined by:

$$A\,(n,k) = \begin{cases} \frac{1}{3\,n+1} & \text{if } k \le n \le 2\,k \\ 0 & \text{otherwise} \end{cases}$$

Inverse Matrix and Sequence Calculation

The sequence $a(n)$ is defined as the row sums of the inverse of matrix A, specifically:

$$a(n) = \sum_{k=1}^{N} (A^{-1})_{n,k}$$

where A^{-1} denotes the inverse of matrix A and N is the size of the matrix up to which the inverse and row sums are calculated.

Conjectural Relation

It is conjectured that:

$$a(n) \bmod 2 \text{ is the first Feigenbaum symbolic sequence } A\,035263.$$

This conjecture has been verified up to the first 2048 te