THE CONVERGENCE VALUE AND THE SIMPLE CONTINUED FRACTIONS OF SOME SMARANDACHE SEQUENCES

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Abstract. In this paper we consider the convergence value and the simple continued fraction of some Smarandache sequences.

Key words. Smarandache sequence, convergence value, simple continued fraction.

In [2], Russo considered the convergence of the Smarandache series, the Smarandache infinite product and the Smarandache simple continued fractions for four Smarandache $U$-product sequences. Let $A=\{a(n)\}_{n=1}^{\infty}$ be a sequence of nonnegative numbers. In this paper we prove two general results as follows.

Theorem 1. If $a(n)<a(n+1)$ for any $n$, then
$$\prod_{n=1}^{\infty} \frac{1}{a(n)} = \begin{cases} \infty, & \text{if } a(1)=0, \\ 0, & \text{if } a(1) \neq 0. \end{cases}$$

Theorem 2. If $a(n)>0$ for any $n$ with $n>1$, then the simple continued fractions
$$\frac{1}{a(1)} \frac{1}{a(2)} \frac{1}{a(3)} \cdots$$
is convergent. Moreover, its value is an irrational number.

Proof of Theorem 1. Under the assumption, the theorem is clear.

Proof of Theorem 2. By [1, Theorems 161 and 166],
we obtain the theorem immediately.

References


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