THE REDUCED SMARANDACHE CUBE-PARTIAL-DIGITAL SUBSEQUENCE IS INFINITE

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Abstract . In this paper we prove that the reduced Smarandache cube-partial-digital subsequence is infinite.
Key words . reduced Smarandache cube-partial-digital subsequence , infinite.

From all cube integers 0,1,8,27,64,125,..., we choose only the terms can be partitioned into groups of digits which are also perfect cubes and disregarding the cube numbers of the form $N \cdot 10^{3t}$, where N is also a cube number and t is a positive integer . Such sequence is called the reduced Smarandache cube-partial-digital subsequence . Bencze [1] and Smith [2] independently proposed the following question.

Question . How many terms in the reduced Smarandache cube-partial-digital subseuence?

In this paper we completely solve the mentioned question . We prove the following result.

Theorem . The reduced Smarandache cube-partial-digital subsequence has infinitely many terms.

Proof . For any positive integer n with n>1, let

(1) $$B(n) = 3.10^n + 3.$$

Then we have

(2) $$B(n))^3 = 27.10^{3n} + 81.10^{2n} + 81.10^n + 27 = 27\underbrace{0 \cdots 0}_{(n\text{-}2)\text{zreos}}81\underbrace{0 \cdots 0}_{(n\text{-}2)\text{zeros}}81\underbrace{0 \cdots 0}_{(n\text{-}2)\text{zeros}}27.$$

By (1) and (2), we see that $(B(n))^3$ belongs to the reduced Smarandache cube-partial-digital subsequence. Thus, this sequence in infinite. The theorem is proved.

References

[1] M. Bencze, Smarandache relationships and subsequence, Smarandache Notions J. 11(2000), 79-85.

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