ON THE SMARANDACHE PRIME ADDITIVE COMPLEMENT SEQUENCE

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Abstract. Let k be an arbitrary large positive integer. In this paper we prove that the Smarandache prime additive complement sequences includes the decreasing sequence $k, k-1, \ldots, 1, 0$.

For any positive integer n, let $p(n)$ be the smallest prime which does not excess n. Further let $d(n) = p(n) - n$. Then the sequence $D = \{d(n)\}_{n=1}^{\infty}$ is called the Smarandache prime additive complement sequence. Smarandache asked that if it is possible to as large as we want but finite decreasing sequence $k, k-1, \ldots, 1, 0$ included in D? Moreover, he conjectured that the answer is negative (see [1, Notion 46]). Howevwer, we shall give a positive answer for Smarandache's questions. In this paper we prove the following result:

Theorem. For an arbitrary large positive integer k, D includes the decreasing sequence $k, k-1, \ldots, 1, 0$.

Proof. Let $n = (k+1)! + 1$. Since $2, 3, \ldots, k+1$ are proper divisors of $(k+1)!$, then all numbers $n+1, n+2, \ldots n+k$ are composite numbers. It implies that $d(n) \geq k$. Therefore, D includes the decreasing sequence k, k-1, ... , 1 , 0 . The theorem is proved.

Reference

1. Dumitrescu and Seleacu, Some Notions and Questions In Number Theory, Erhus Univ. Press, Glendale, 1994