SMARANDACHE CEIL FUNCTIONS*

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ABSTRACT

In this paper some definitions, examples and conjectures are exposed related to the Smarandache type functions, found in the Archives of the Arizona State University, Tempe, USA Special Collections.

(1) Smarandache Ceil Function of Second Order:

2, 4, 3, 6, 4, 6, 10, 12, 5, 9, 14, 8, 6, 20, 22, 15, 12, 7, 10, 26, 18, 28, 30, 21, 8, 34, 12, 15, 38, 20, 9, 42, 44, 30, 46, 24, 14, 33, 10, 52, 18, 28, 58, 39, 60, 11, 62, 25, 42, 16, 66, 45, 68, 70, 12, 21, 74, 30, 76, 51, 78, 40, 18, 82, 84, 13, 57, 86, ...

($S_2(n)$ = m, where m is the smallest positive integer for which n divides m^2.)

Reference:

(a) **Surfing on the Ocean of Numbers -- a few Smarandache Notions and Similar Topics**, by Henry Ibstedt, Erhus University Press, Vail, USA, 1997; p. 27-30.

(2) Smarandache Ceil Function of Third Order:

2, 2, 3, 6, 4, 6, 10, 6, 5, 3, 14, 4, 6, 10, 22, 15, 12, 7, 10, 26, 6, 14, 30, 21, 4, 34, 6, 15, 38, 20, 9, 42, 22, 30, 46, 12, 14, 33, 10, 26, 6, 28, 58, 39, 30, 11, 62, 5, 42, 8, 66, 15, 34, 70, 12, 21, 74, 30, 38, 51, 78, 20, 18, 82, 42, 13, 57, 86, ...

($S_3(n)$ = m, where m is the smallest positive integer for which n divides m^3.)

Reference:

(a) **Surfing on the Ocean of Numbers -- a few Smarandache Notions and Similar Topics**, by Henry Ibstedt, Erhus University Press, Vail, USA, 1997; p. 27-30.

(3) Smarandache Ceil Function of Fourth Order:

2, 2, 3, 6, 2, 6, 10, 6, 5, 3, 14, 4, 6, 10, 22, 15, 6, 7, 10, 26, 6, 14, 30, 21, 4, 34, 6, 15, 38, 10, 3, 42, 22, 30, 46, 12, 14, 33, 10, 26, 6, 14, 58, 39, 30, 11, 62, 5, 42, 4, 66, 15, 34, 70, 6, 21, 74, 30, 38, 51, 78, 20, 6, 82, 42, 13, 57, 86, ...

($S_4(n)$ = m, where m is the smallest positive integer for which n divides m^4.)

Reference:

(a) **Surfing on the Ocean of Numbers -- a few Smarandache Notions and Similar Topics**, by Henry Ibstedt, Erhus University Press, Vail, USA, 1997; p. 27-30.

(4) Smarandache Ceil Function of Fifth Order:

2, 2, 3, 6, 2, 6, 10, 6, 5, 3, 14, 2, 6, 10, 22, 15, 6, 7, 10, 26, 6, 14, 30, 21, 4, 34, 6, 15, 38, 10, 3, 42, 22, 30, 46, 6, 14, 33, 10, 26, 6, 14, 58, 39, 30, 11, 62, 5, 42, 4, 66, 15, 34, 70, 6, 21, 74, 30, 38, 51, 78, 10, 6, 82, 42, 13, 57, 86, ...

(S (n) =m, where m is the smallest positive integer for which n divides m^5.)
5

Reference:

(a) **Surfing on the Ocean of Numbers -- a few Smarandache Notions and Similar Topics**, by Henry Ibstedt, Erhus University Press, Vail, USA, 1997; p. 27-30.

(5) Smarandache Ceil Function of Sixth Order:

2, 2, 3, 6, 2, 6, 10, 6, 5, 3, 14, 2, 6, 10, 22, 15, 6, 7, 10, 26, 6, 14, 30, 21, 2, 34, 6, 15, 38, 10, 3, 42, 22, 30, 46, 6, 14, 33, 10, 26, 6, 14, 58, 39, 30, 11, 62, 5, 42, 4, 66, 15, 34, 70, 6, 21, 74, 30, 38, 51, 78, 10, 6, 82, 42, 13, 57, 86, ...

(S (n) = m, where m is the smallest positive integer for which n divides m^6.)
6

Reference:

(a) **Surfing on the Ocean of Numbers -- a few Smarandache Notions and Similar Topics**, by Henry Ibstedt, Erhus University Press, Vail, USA, 1997; p. 27-30.

(6) Smarandache - Fibonacci triplets:

11, 121, 4902, 26245, 32112, 64010, 368140, 415664, 2091206, 2519648, 4573053, 7783364, 79269727, 136193976, 321022289, 445810543, 559199345, 670994143, 836250239, 893950202, 937203749, 1041478032, 1148788154, ...

(An integer n such that S(n) = S(n-1) + S(n-2) where S(k) is the Smarandache function: the smallest number k such that S(k)! is divisible by k.)

Remarks:

It is not known if this sequence has infinitely or finitely many terms.

H. Ibstedt and C. Ashbacher independently conjectured that there are infinitely many.

H. I. found the biggest known number: 19 448 047 080 036.

References:

(a) **Surfing on the Ocean of Numbers -- a few Smarandache Notions and Similar Topics**, by Henry Ibstedt, Erhus University Press, Vail, USA, 1997; p. 19-23.

(b) C. Ashbacher and M. Mudge, <Personal Computer World>, London, October 1995; p. 302.

(7) Smarandache-Radu duplets

224, 2057, 265225, 843637, 6530355, 24652435, 35558770, 40201975, 45388758, 46297822, 67697937, 138852445, 157906534, 171531580, 299441785, 551787925, 1223918824, 1276553470, 1655870629, 1853717287, 1994004499, 2256222280, ...

(An integer n such that between S(n) and S(n+1) there is no prime [S(n) and S(n + 1) included].

where S(k) is the Smarandache function: the smallest number k such that S(k)! is divisible by k.)

Remarks:

It is not known if this sequence has infinitely or finitely many terms.

H. Ibstedt conjectured that there are infinitely many.

H. I. found the biggest known number:

270 329 975 921 205 253 634 707 051 822 848 570 391 313!

References:

(a) **Surfing on the Ocean of Numbers -- a few Smarandache Notions and Similar Topics**, by Henry Ibstedt, Erhus University Press, Vail, USA, 1997; p. 19-23.

(b) I. M. Radu, <Mathematical Spectrum>, Sheffield University, UK, Vol. 27, (No. 2), 1994/5; p. 43.

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