A pattern that relates Carmichael numbers to the number 66

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Abstract. The length of the period of the rational number which is the sum, from n = 1 to n = ∞, of the numbers $1/(C_n - 1)$, where $\{C_1, C_2, ..., C_n\}$ is the ordered set of Carmichael numbers, i.e. {561, 1105, 1729, 2465, ...}, seems to be always multiple of 66. This property doesn't apply always when $C_1, C_2, ..., C_n$ are not consecutive, so this pattern could be a way to determinate if between two known Carmichael numbers there exist other unknown Carmichael numbers.

Conjecture:

The length of the period of the rational number which is the sum, from n = 1 to n = ∞, of the numbers $1/(C_n - 1)$, where $\{C_1, C_2, ..., C_n\}$ is the ordered set of Carmichael numbers, is always multiple of 66.

Verifying the conjecture (for n ≤ 12):

: the sum 1/560 + 1/1104 is equal to a rational number with the length of the period 66;
: the sum 1/560 + 1/1104 + 1/1728 is equal to a rational number with the length of the period 66;
: the sum 1/560 + 1/1104 + 1/1728 + 1/2464 is equal to a rational number with the length of the period 66;
: the sum 1/560 +...+ 1/2464 + 1/2820 is equal to a rational number with the length of the period 1518 = 66*23;
: the sum 1/560 +...+ 1/2820 + 1/6600 is equal to a rational number with the length of the period 1518 = 66*23;
: the sum 1/560 +...+ 1/6600 + 1/8910 is equal to a rational number with the length of the period 4554 = 66*69;
: the sum 1/560 +...+ 1/8910 + 1/10584 is equal to a rational number with the length of the period 31878 = 66*483;
: the sum 1/560 +...+ 1/10584 + 1/15840 is equal to a rational number with the length of the period 31878 = 66*483;

: the sum 1/560 +...+ 1/15840 + 1/29340 is equal to a rational number with the length of the period 286902 = 66*4347;

: the sum 1/560 +...+ 1/29340 + 1/41040 is equal to a rational number with the length of the period 286902 = 66*4347;

: the sum 1/560 +...+ 1/41040 + 1/46656 is equal to a rational number with the length of the period 286902 = 66*4347.

Note:

This is a characteristc only of absolute Fermat pseudoprimes; in the case of relative Fermat pseudoprimes, Poulet numbers for instance, this pattern doesn’t apply: for the first two Poulet numbers, 341 and 561, we have the sum 1/340 + 1/560 equal to a rational number with the length of the period 48.

Note:

This is a characteristc only of the sum of ordered Carmichael numbers, for instance, for the first and the third Carmichael numbers, 561 and 1729, we have the sum 1/560 + 1/1728 equal to a rational number with the length of the period 6.

Comment:

This property could be a way to determinate if between two known Carmichael numbers there exist other unknown Carmichael numbers.