A probably infinite sequence of primes formed using Carmichael numbers, the number 584 and concatenation

Marius Coman
Bucuresti, Romania
email: mariuscoman13@gmail.com

Abstract. In this paper I make a conjecture which states that there exist an infinity of primes of the form N/3^m, where m is positive integer and N is the number formed concatenating to the left a Carmichael number with the number 584. Such primes are 649081 = 5841729/3^2, 1947607 = 5842821/3, 1948867 = 5846601/3 etc. I also make few comments about a certain kind of semiprimes.

Conjecture:

There exist an infinity of primes of the form N/3^m, where m is positive integer and N is the number formed concatenating to the left a Carmichael number with the number 584.

Examples:
(Of such primes)

: 649081 = 5841729/3^2;
: 1947607 = 5842821/3^1;
: 1948867 = 5846601/3^1;
: 649879 = 5848911/3^2;
: 2164483 = 58441041/3^3;
: 6495997 = 58463973/3^2;
: 64909829 = 584188461/3^2;
: 194799667 = 584399001/3^1;
: 64972073 = 584748657/3^2
: 194946067 = 584838201/3^1.

Conjecture:

There exist an infinity of semiprimes p*q = N/3^m, where p < q, m is positive integer and N is the number formed concatenating to the left a Carmichael number with the number 584, with the property that q – p + 1 is a prime number.

Examples:
(Of such semiprimes)

: 58429341/3^2 = 109*59561 and 59561 – 109 + 1 = 59453, which is prime;
: 58452633/3^2 = 37*88969 and 88969 – 73 + 1 = 88897, which is prime;
: 584162401/3^0 = 37*15788173 and 15788173 – 37 + 1 = 15788137, which is prime.

Note:
For more about this type of semiprimes see my previous paper "Two exciting classes of odd composites defined by a relation between their prime factors". In the paper mentioned I observed the semiprimes with the propery from above (p*q, p < q, such that q – p + 1 is prime) but also the sequences of semiprimes p1*q1, such that q1 – p1 = p2*q2, such that q2 – p2 = p3*q3 and so on; taking for instance the Carmichael number 1713045574801 concatenated to the left with 584 we have a chain of such consecutive semiprimes, finally the iterative operation ending with a prime:

: 5841713045574801/9 = 73*8891496264193 semiprime;
: 8891496264193 - 73 + 1 = 239*37202913239 semiprime;
: 37202913239 – 239 + 1 = 29*1282859069 semiprime;
: 1282859069 – 29 + 1 = 109*11769349 semiprime;
: 11769349 – 109 + 1 = 11*1069931 semiprime;
: 1069931 – 11 + 1 = 1069921 prime.

Comment:

There exist yet another interesting relation between Carmichael numbers and the number 584; the numbers 561 and 1729, the first and the third Carmichael numbers, are both of the form 584*n – 23 (they are obtained for n = 1, respectively n = 3). So we have the relation (1729 + 23)/(561 + 23) = 3, an integer, an interesting relation between the numbers 561, 1729 and 23, all three "cult numbers". For other interesting relations between the number 561 and the Hardy-Ramanujan number, 1729, see my previous paper "Special properties of the first absolute Fermat pseudoprime, the number 561".