Sequence of Poulet numbers obtained by formula mn-n+1 where m of the form 270k+13

Abstract. In this paper we conjecture that there exist an infinity of Poulet numbers of the form m*n – n + 1, where m is of the form 270*k + 13. Incidentally, verifying this conjecture, we found results that encouraged us to issue yet another conjecture, i.e. that there exist an infinity of numbers s of the form 270*k + 13 which are semiprimes s = p*q having the property that q – p + 1 is prime or power of prime.

Conjecture:

There exist an infinity of Poulet numbers of the form m*n – n + 1, where m is of the form 270*k + 13.

Examples:

: for k = 1, m = 283 and the following numbers are Poulet numbers:
: 2821 = 283*10 – 10 + 1 (...)

: for k = 2, m = 553 and the following numbers are Poulet numbers:
: 1105 = 553*2 – 2 + 1 (...)

: for k = 4, m = 1093 and the following numbers are Poulet numbers:
: 3277 = 1093*3 – 3 + 1;
: 4369 = 1093*4 – 4 + 1;
: 5461 = 1093*5 – 4 + 1 (...)

The sequence of Poulet numbers of the form m*n – n + 1, where m is of the form 270*k + 13:

: 1105, 2821, 3277, 4369, 5461 (...)

Conjecture:

There exist an infinity of numbers s of the form 270*k + 13 which are semiprimes s = p*q having the property that q – p + 1 is prime or power of prime.

Examples:

: for k = 2, s = 553 = 7*79 and 79 – 7 + 1 = 73, prime;

: for k = 5, s = 1363 = 29*47 and 47 – 29 + 1 = 19, prime;
: for k = 6, s = 1633 = 23*71 and 71 – 23 + 1 = 49, power of prime (7^2);
: for k = 7, s = 1903 = 11*173 and 173 – 11 + 1 = 163, prime;
: for k = 8, s = 2173 = 41*53 and 53 – 41 + 1 = 13, prime;
: for k = 9, s = 2443 = 7*349 and 349 – 7 + 1 = 343, power of prime (7^3);
: for k = 11, s = 2983 = 19*157 and 157 – 19 + 1 = 139, prime;
: for k = 15, s = 4063 = 17*239 and 239 – 17 + 1 = 223, prime;
: for k = 16, s = 4333 = 7*619 and 619 – 7 + 1 = 613, prime;
: for k = 18, s = 4873 = 11*443 and 443 – 11 + 1 = 433, prime;
: for k = 19, s = 5143 = 37*139 and 139 – 37 + 1 = 103, prime;
: for k = 24, s = 6493 = 43*151 and 151 – 43 + 1 = 109, prime;
: for k = 26, s = 7033 = 13*541 and 541 – 13 + 1 = 529, power of prime (23^2);
: for k = 27, s = 7303 = 67*109 and 109 – 67 + 1 = 43, prime;
: for k = 33, s = 8383 = 83*101 and 101 – 83 + 1 = 19, prime;
(...)
: for k = 20000, s = 5400013 = 1627*3319 and 3319 – 1627 + 1 = 1693, prime;
(...)
: for k = 190000, s = 51300013 = 1487*34499 and 34499 – 1487 + 1 = 33013, prime;

Note:

Many other numbers s of the form 270*k + 13 are semiprimes s = p1*q1 having the property that q1 – p1 + 1 is a semiprime p2*q2 having the property that q2 – p2 is prime.

Example:

: for k = 2000000, s = 540000013 = 7*77142859 and 77142859 – 7 + 1 = 77142853 = 41*1881533 and 1881533 – 41 + 1 = 1881493, prime.