Primes obtained concatenating p*q-p with p*q-q then with p*q where p, q primes of the form 6k+1

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Abstract. This paper is inspired by one of my previous papers, namely "Large primes obtained concatenating the numbers P - d(k) where d(k) are the prime factors of the Poulet number P", where I conjectured that there are an infinity of primes which can be obtained concatenating the numbers P - d(1); P - d(2); ...; P – d(k); P, where d(1), ..., d(k) are the prime factors of the Poulet number P. Because some of these Poulet numbers are 2-Poulet numbers of the form (6k + 1)*(6h + 1) I extend in this paper that ideea conjecturing that for any prime p of the form 6k + 1 there exist an infinity of primes q of the form 6h + 1 such that the number obtained concatenating p*q – p with p*q – q then with p*q is prime.

Conjecture:

For any prime p of the form 6k + 1 there exist an infinity of primes q of the form 6h + 1 such that the number n obtained concatenating p*q – p with p*q – q then with p*q is prime.

Example: using the sign "//" with the meaning "concatenated to", for p = 7 there exist q = 79 such that the number n = (7*79 – 7)//(7*79 – 79)//7*79 = 546474553 is prime.

The first three such primes n for p = 7:
(corresponding to q = 31, 37, 79)

: 210186217 = (7*31 – 7)//(7*31 – 31)//7*31;
: 252222259 = (7*37 – 7)//(7*37 – 37)//7*37;
: 546474553 = (7*79 – 7)//(7*79 – 79)//7*79.

The first three such primes n for p = 13:
(corresponding to q = 31, 37, 67)

: 390372403 = (13*31 – 13)//(13*31 – 31)//13*31;
: 468444481 = (13*37 – 13)//(13*37 – 37)//13*37;
: 858804871 = (13*67 – 13)//(13*67 – 67)//13*67.

The first such prime n for p = 19:
(corresponding to q = 61)

: 114010981159 = (19*61 - 19)//(19*61 - 61)//19*61.

The first such prime n for p = 31:
(corresponding to q = 19)

: 558570589 = (31*19 - 31)//(31*19 - 19)//31*19.

The first such prime n for p = 37:
(corresponding to q = 19)

: 666684703 = (37*19 - 37)//(37*19 - 19)//37*19.

The first such prime n for p = 43:
(corresponding to q = 67)

: 283828142881 = (43*67 - 43)//(43*67 - 67)//43*67.

The first such prime n for p = 61:
(corresponding to q = 13)

: 732780793 = (61*13 - 61)//(61*13 - 13)//61*13.

The first such prime n for p = 67:
(corresponding to q = 31)

: 201020462077 = (67*31 - 67)//(67*31 - 31)//67*31.

The first such prime n for p = 73:
(corresponding to q = 19)

: 131413681387 = (73*19 - 73)//(73*19 - 19)//73*19.

The first such prime n for p = 79:
(corresponding to q = 19)

: 142214821501 = (79*19 - 79)//(79*19 - 19)//79*19.