Four conjectures on the numbers p, 2p-1, 3p-10 and np-n+1 where p prime

Abstract. In this paper I make the following four conjectures: (I) there exist an infinity of primes p such that 3*p – 10 is also prime; (II) there exist an infinity of triplets of primes (p, 2*p – 1, 3*p – 10); (III) there exist an infinity of primes q obtained concatenating a prime p to the right with 2*p – 1 and to the left with 3 (example: for p = 11, q = 31121, prime; (IV) there exist, for any n positive integer, n > 1, an infinity of primes q obtained concatenating a prime p to the right with n*p – n + 1 and to the left with 3 (examples: for n = 5 and p = 19, q = 31991, prime; for n = 8 and p = 13, q = 31397, prime).

Conjecture 1:

There exist an infinity of primes p such that q = 3*p – 10 is also prime.

Primes p such that 3*p – 10 is also prime (see A230227 in OEIS):
: 5, 7, 11, 13, 17, 19, 23, 31, 37, 41, 47, 53, 59, 61, 67, 79, 83, 89, 97, 101, 107, 109, 131, 137, 151, 157, 163, 167, 173, 191, 193, 199, 223, 229, 251, 257, 269, 277, 283, 307, 313, 317, 331, 347, 353, 367, 373, 397, 401, 409 (...)

The sequence of primes q:

: 5, 11, 23, 29, 41, 47, 59, 83, 101, 113, 131, 149 (...)

Conjecture 2:

There exist an infinity of triplets of primes (p, q = 2*p – 1, r = 3*p – 10). Note that p, p > 3, can be only of the form 6*k + 1.

Primes p such that 2*p – 1 is also prime (see A005382 in OEIS):
: 2, 3, 7, 19, 31, 37, 79, 97, 139, 157, 199, 211, 229, 271, 307, 331, 337, 367, 379, 439, 499, 547, 577, 601, 607, 619, 661, 691, 727, 811, 829, 877, 937, 967, 997, 1009, 1069, 1171, 1237, 1279, 1297, 1399, 1429, 1459, 1531, 1609, 1627, 1657, 1759, 1867, 2011 (...)

The sequence of triplets (p, q, r):

: (7, 13, 11), (19, 37, 47), (31, 61, 83), (37, 73, 101), (79, 157, 227), (97, 193, 281), (157, 313, 461), (99, 397, 587), (229, 457, 677), (307, 613, 911), (331, 661, 983), (367, 733, 1091), (439, 877, 1307), (499, 997, 1487) (...)

Note the chain of six triplets obtained for six consecutive primes p of the form 6*k + 1 for which 2*p – 1 is prime (7, 19, 31, 37, 79, 97).

Note that for 14 primes p for which 2*p – 1 is also prime from the first 20 such primes the number 3*p – 10 is also prime.

Conjecture 3:

There exist an infinity of primes q obtained concatenating a prime p to the right with 2*p – 1 and to the left with 3 (example: for p = 11, q = 31121, prime).

The sequence of primes q:

: 359, 31121, 32957, 33161, 33773, 371141, 379157, 3127253, 3157313, 3191381 (...)

Conjecture 4:

There exist, for any n positive integer, n > 1, an infinity of primes q obtained concatenating a prime p to the right with m = n*p – n + 1 and to the left with 3 (examples: for n = 5 and p = 19, q = 31991, prime; for n = 8 and p = 13, q = 31397, prime).

The sequence of primes p for n = 3 (m = 3*p – 2):
(Note that p can be only of the form 6*k + 1)

: 3719, 31337, 31957, 33191, 343127, 397289 (...), obtained for p = 7, 13, 19, 31, 43, 97 (...)

The sequence of primes p for n = 4 (m = 4*p – 3):
(Note that p can be only of the form 6*k + 1)

: 3517, 31973, 343169, 361241, 371281, 3103409 (...), obtained for p = 5, 19, 43, 61, 71, 103 (...)

The sequence of primes p for n = 5 (m = 5*p – 4):

: 31151, 31991, 359291, 373361, 379391, 3109541 (...), obtained for p = 11, 19, 59, 73, 79, 109 (...)

The sequence of primes p for n = 6 (m = 6*p - 5):
(Note that p can be only of the form 6*k + 1)

: 337217, 343253, 367397, 3109649 (...),
obtained for p = 37, 43, 67, 109 (...)

The sequence of primes p for n = 7 (m = 7*p - 6):

: 3529, 319127, 341281, 359407, 361421, 371491, 397673, 3107743, 3131911, 3139967 (...),
obtained for p = 5, 19, 41, 59, 61, 71, 97, 107, 131, 139 (...)