Three conjectures on probably infinite sequences of primes created through concatenation of primes with the powers of 2

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Abstract. In this paper I present three conjectures, i.e.: (1) For any prime p greater than or equal to 7 there exist n, a power of 2, such that, concatenating to the left p with n the number resulted is a prime (2) For any odd prime p there exist n, a power of 2, such that, subtracting one from the number resulted concatenating to the right p with n, is obtained a prime (3) For any odd prime p there exist n, a power of 2, such that, adding one to the number resulted concatenating to the right p with n, is obtained a prime.

Conjecture 1:

For any prime p greater than or equal to 7 there exist n, a power of 2, such that, concatenating to the left p with n the number resulted is a prime.

The sequence of the primes obtained, for p ≥ 7 and the least n for which the number obtained through concatenation is prime:

47, 211, 1613, 3217, 419, 223, 229, 431, 1637, 241, 443, 1638447, 853, 859, 461, 467, 271, 6473, 479, 283, 12889, 1697, 8101, 16103, 2048107, 64109, 2113, 4127, 2131 (...)

The corresponding sequence of the exponents of 2 for which a prime is obtaiend:

2, 1, 4, 5, 2, 1, 1, 2, 4, 1, 2, 14, 3, 3, 2, 2, 1, 6, 2, 1, 7, 4, 3, 4, 11, 6, 1, 2, 1 (...)

Note: I also conjecture that there exist an infinity of pairs of primes (p, p + 6) such that n has that same value: such pairs are: (23, 29), (53, 59), (61, 67), which create the primes (223, 229), (853, 859), (461, 467).

Conjecture 2:

For any odd prime p there exist n, a power of 2, such that, subtracting one from the number resulted concatenating to the right p with n, is obtained a prime.

The sequence of the primes obtained, for odd p and the least n for which the number obtained through concatenation is prime:

31, 53, 71, 113, 131, 173, 191, 233, 293, 311, 373, 41257, 431, 47262143, 531023, 593, 613, 673, 71257 (...)

The corresponding sequence of the exponents of 2 for which a prime is obtaiend:

1, 2, 1, 2, 1, 2, 1, 2, 2, 1, 2, 8, 1, 18, 10, 2, 2, 2, 8 (...)

Note: I also conjecture that there exist an infinity of pairs of primes (p, p + 6) such that n has that same value: such pairs are: (5, 11), (7, 13), (11, 17), (23, 29), (31, 37), (61, 67) which create the primes (53, 113), (71, 131), (113, 173), (233, 239), (311, 317), (613, 673).

Conjecture 3:

For any odd prime p there exist n, a power of 2, such that, adding one to the number resulted concatenating to the right p with n, is obtained a prime.

The sequence of the primes obtained, for odd p and the least n for which the number obtained through concatenation is prime:

317, 53, 73, 113, 139, 173, 193, 233, 293, 313, 373, 419, 479, 5333, 613, 673, 719, 733, 7933, 839, 163, 8933 (...)

The corresponding sequence of the exponents of 2 for which a prime is obtaiend:

4, 1, 1, 1, 3, 1, 1, 1, 1, 1, 1, 3, 5, 1, 1, 3, 1, 5, 3, 1, 5 (...)

Note: I also conjecture that there exist an infinity of pairs of primes (p, p + 6) such that n has that same value: such pairs are: (5, 11), (11, 17), (17, 23) which create the primes (53, 113), (113, 173), (173, 233).