Conjecture on the numbers of the form np^2-np+p-2 where p prime

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Abstract. In this paper I conjecture that there exist, for any p prime, p greater than or equal to 7, an infinity of positive integers n such that the number n*p^2 – n*p + p – 2 is prime.

Conjecture:

There exist, for any p prime, p greater than or equal to 7, an infinity of positive integers n such that the number n*p^2 – n*p + p – 2 is prime.

The sequence of the numbers n*p^2 – n*p + p – 2 for p = 7:
(in other words the numbers of the form 42*n + 5)

: 47, 89, 131, 173, 215, 257, 299, 341, 383, 425 (...)

The sequence of the primes of the form 42*n + 5:

: 47, 89, 131, 173, 257, 383 (...)

Note that there are also Poulet numbers that can be written as 42*n + 5; two of such numbers are 341 = 11*31 (n = 8) and 8321 = 53*157 (n = 198); these 2-Poulet numbers have also in common the fact that 11*3 – 2 = 31 and 53*3 – 2 = 157.

The sequence of the numbers n*p^2 – n*p + p – 2 for p = 11:
(in other words the numbers of the form 110*n + 9)

: 119, 229, 339, 449, 559, 669, 779, 889, 999, 1109 (...)

The sequence of the primes of the form 110*n + 9:

: 229, 449, 1109 (...)

The sequence of the numbers n*p^2 – n*p + p – 2 for p = 13:
(in other words the numbers of the form 156*n + 11)

: 167, 323, 479, 635, 791, 947, 1103, 1259, 1415 (...)

The sequence of the primes of the form 156*n + 11:

: 47, 89, 131, 173, 257, 383 (...)

The sequence of the numbers n*p^2 – n*p + p – 2 for p = 17:
(in other words the numbers of the form 272*n + 15)

: 287, 559, 831, 1103, 1375, 1647, 1919, 2191, 2463 (...)

The sequence of the primes of the form 272*n + 15:

: 1103, 3823, 4639 (...)

Note that there exist numbers that can be written in more than one way as n*p^2 – n*p + p – 2; such a number is 1103 = 7*13^2 – 7*13 + 13 – 2 = 4*17^2 – 4*17 + 17 – 2.

The sequence of the numbers n*p^2 – n*p + p – 2 for p = 19:
(in other words the numbers of the form 342*n + 17)

: 359, 701, 1043, 1385, 1727, 2069, 2411, 2753, 3095 (...)

The sequence of the primes of the form 272*n + 15:

: 359, 701, 2069, 2411, 2753 (...)

The sequence of the primes of the form 110*n + 9, where n is of the form 10^k, k greater than or equal to 0:

: 1109, 1100009, 1100000009 (...)

The sequence of the primes of the form 156*n + 11, where n is of the form 10^k, k greater than or equal to 0:

: 167, 1571, 156011, 1560011, 156000011, 15600000000000000000011, 1560000000000000000000000000011, 1560000000000000000000000000000000011(...)

The sequence of the primes of the form 342*n + 17, where n is of the form 10^k, k greater than or equal to 0:

: 359, 34217, 342000000000000000000000017, 34200000000000000000000000000017 (...)