A conjecture on the squares of primes of the form 6k - 1

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Abstract. In this paper I make a conjecture on the squares of primes of the form 6k – 1, conjecture that states that by a certain deconcatenation of those numbers (each one in other two numbers) it will be obtained similar results.

Conjecture:

For any square of a prime p of the form p = 6*k – 1 is true at least one of the following six statements:

(1) p^2 can be deconcatenated into a prime and a number congruent to 2, 3 or 5 modulo 6;
(2) p^2 can be deconcatenated into a semiprime q*r where r – q = 8*k and a number congruent to 2, 3 or 5 modulo 6;
(3) p^2 can be deconcatenated into a semiprime 3*q, where q is of the form 10*k + 7, and a number congruent to 1 modulo 6;
(4) p^2 can be deconcatenated into a number of the form 49 + 120*k and a number congruent to 0 modulo 6;
(5) p^2 can be deconcatenated into a number of the form 121 + 48*k and a number congruent to 0 modulo 6;
(6) p^2 is a palindromic number.

Examples for case (1):

: for 5^2 = 25 we got 5 prime and 2 ≡ 2 (mod 6);
: for 17^2 = 289 we got 89 prime and 2 ≡ 2 (mod 6);
: for 23^2 = 529 we got 29 prime and 5 ≡ 5 (mod 6);
: for 29^2 = 841 we got 41 prime and 8 ≡ 2 (mod 6);
: for 53^2 = 2809 we got 809 prime and 2 ≡ 2 (mod 6);
: for 71^2 = 5041 we got 41 prime and 50 ≡ 2 (mod 6);
: for 83^2 = 6889 we got 89 prime and 68 ≡ 2 (mod 6);
: for 107^2 = 11449 we got 449 prime and 11 ≡ 5 (mod 6);
: for 167^2 = 27889 we got 89 prime and 278 ≡ 2 (mod 6);
: for 173^2 = 29929 we got 29 prime and 29 ≡ 5 (mod 6) also 929 prime and 2 ≡ 2 (mod 6);
: for 179^2 = 32041 we got 41 prime and 320 ≡ 2 (mod 6);
: for 191^2 = 36481 we got 6481 prime and 3 ≡ 3 (mod 6);
: for 197^2 = 38809 we got 809 prime and 38 ≡ 2 (mod 6);
: for 227^2 = 51529 we got 29 prime and 515 ≡ 5 (mod 6);
: for 233^2 = 54289 we got 89 prime and 542 ≡ 2 (mod 6);
: for 239^2 = 57121 we got 7121 prime and 5 ≡ 5 (mod 6);
: for 269^2 = 72361 we got 61 prime and 723 ≡ 3 (mod 6).

Examples for case (2):

: for 47^2 = 2209 we got 209 = 11*19 where 19 – 11 = 8*1 and 2 ≡ 2 (mod 6);
: for 59^2 = 3481 we got 481 = 13*37 where 37 – 13 = 8*3 and 3 ≡ 3 (mod 6);
: for 131^2 = 17161 we got 161 = 7*23 where 23 – 7 = 8*2 and 17 ≡ 5 (mod 6);
: for 149^2 = 22201 we got 2201 = 31*71 where 71 – 31 = 8*5 and 2 ≡ 2 (mod 6).

Examples for case (3):

: for 41^2 = 1681 we got 681 = 3*227 and 1 ≡ 1 (mod 6);
: for 89^2 = 7921 we got 921 = 3*307 and 7 ≡ 1 (mod 6).

Examples for case (4):

: for 83^2 = 6889 we got 889 = 49 + 120*7 and 6 ≡ 0 (mod 6);
: for 113^2 = 12769 we got 769 = 49 + 120*6 and 12 ≡ 0 (mod 6);
: for 137^2 = 18769 we got 769 = 49 + 120*6 and 18 ≡ 0 (mod 6);
: for 257^2 = 66049 we got 6049 = 49 + 120*50 and 6 ≡ 0 (mod 6);
: for 263^2 = 69169 we got 9169 = 49 + 120*76 and 6 ≡ 0 (mod 6).

Examples for case (5):

: for 251^2 = 63001 we got 3001 = 121 + 48*60 and 6 ≡ 0 (mod 6).

Examples for case (6):

: 11^2 = 121;
: 101^2 = 10201.

Note:

This conjecture is verified up to p = 269.