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 3^n*q and a number congruent to 1 modulo 6;
(3) p^2 can be deconcatenated into a number n such that n + 1 is prime or power of prime and the digit 1;
(4) p^2 can be deconcatenated into a number n such that n + 1 is prime or power of prime and the digit 9;
(5) p^2 can be deconcatenated into a number of the form 49 + 120*k and a number congruent to 0 modulo 6;
(6) p^2 can be deconcatenated into a number of the form 121 + 24*k and a number congruent to 0 modulo 6.

Examples for case (1):

: for 67^2 = 4489 we got 89 prime and 44 ≡ 2 (mod 6);
: for 73^2 = 5329 we got 29 prime and 53 ≡ 5 (mod 6);
: for 79^2 = 6241 we got 41 prime and 62 ≡ 2 (mod 6);
: for 109^2 = 11881 we got 881 prime and 11 ≡ 2 (mod 6);
: for 163^2 = 26569 we got 569 prime and 26 ≡ 2 (mod 6);
: for 181^2 = 32761 we got 761 prime and 32 ≡ 5 (mod 6);
: for 199^2 = 39601 we got 601 prime and 39 ≡ 3 (mod 6).

Examples for case (2):

: for 13^2 = 169 we got 69 = 3*23 and 1 ≡ 1 (mod 6);
: for 37^2 = 1369 we got 369 = 3^2*41 and 1 ≡ 1 (mod 6);
: for 43^2 = 1849 we got 849 = 3*283 and 1 ≡ 1 (mod 6);
: for 61^2 = 3721 we got 21 = 3*7 and 37 ≡ 1 (mod 6);
: for 127^2 = 16129 we got 6129 = 3^3*227 and 1 ≡ 1 (mod 6);
: for 193^2 = 37249 we got 249 = 3*83 and 37 ≡ 1 (mod 6).

Examples for case (3):

: for $19^2 = 361$ we got $36 + 1 = 37$ prime;
: for $31^2 = 961$ we got $96 + 1 = 97$ prime;
: for $79^2 = 6241$ we got $624 + 1 = 625$ power of prime.
: for $139^2 = 19321$ we got $1932 + 1 = 1933$ prime;
: for $151^2 = 22801$ we got $2280 + 1 = 2281$ prime.

Examples for case (4):

: for $7^2 = 49$ we got $4 + 1 = 5$ prime;
: for $97^2 = 9409$ we got $940 + 1 = 941$ prime;
: for $103^2 = 10609$ we got $1060 + 1 = 1061$ prime.

Examples for case (5):

: for $157^2 = 24649$ we got $649 = 49 + 120*5$ and $24 \equiv 0 \pmod 6$.

Examples for case (6):

: for $79^2 = 6241$ we got $241 = 121 + 24*5$ and $6 \equiv 0 \pmod 6$.

Note:

This conjecture is verified up to $p = 199$.

Note:

I mention that this conjecture and the one from my previous paper "A conjecture on the squares of primes of the form 6k – 1" were made with the title of *jocandi causa*. It is not relevant if they are not true if they raise interesting questions about squares of primes.