Three conjecture on the numbers obtained concatenating p^2 with (p^2+1)÷2, p+12, p^2+12

Abstract. In this paper I make the following three conjectures on squares of primes: (I) there exist an infinity of primes q obtained concatenating to the left a square of a prime p^2 with the number (p^2 + 1)/2 (example: for p = 17, p^2 = 289 and q is the number obtained concatenating 289 to the left with (p^2 + 1)/2 = 145, i.e. q = 145289, prime); (II) there exist an infinity of primes q obtained concatenating to the left a square of a prime p^2 with the number p + 12 (example: for p = 7, p^2 = 49 and q = 1949, prime); (III) there exist an infinity of primes q obtained concatenating to the left a square of a prime p^2 with the number p^ + 12 (example: for p = 11, p^2 = 121 and q = 133121, prime).

Conjecture 1:

There exist an infinity of primes q obtained concatenating to the left a square of a prime p^2 with the number (p^2 + 1)/2 (example: for p = 17, p^2 = 289 and q is the number obtained concatenating 289 to the left with (p^2 + 1)/2 = 145, i.e. q = 145289, prime).

The sequence of primes q:

: q = 2549 for p = 7;
: q = 61121 for p = 11;
: q = 145289 for p = 17;
: q = 181361 for p = 19;
: q = 8411681 for p = 41;
: q = 14052809 for p = 53;
: q = 26655329 for p = 73; (...)

Conjecture 2:

There exist an infinity of primes q obtained concatenating to the left a square of a prime p^2 with the number p + 12 (example: for p = 7, p^2 = 49 and q = 1949, prime). Note that p can be only of the form 6*k + 1 (otherwise the number obtained is divisible by 3).

The sequence of primes q:

: q = 1949 for p = 7;
: q = 25169 for p = 13;
: q = 43961 for p = 31;
: q = 551849 for p = 43;
: q = 1099409 for p = 97; (...)

Conjecture 3:

There exist an infinity of primes q obtained concatenating to the left a square of a prime p^2 with the number p^2 + 12 (example: for p = 11, p^2 = 121 and q = 133121, prime).

The sequence of primes q:

: q = 133121 for p = 11;
: q = 373361 for p = 19;
: q = 541529 for p = 23;
: q = 37333721 for p = 61;
: q = 94219409 for p = 97;
: q = 1021310201 for p = 101;
: q = 1278112769 for p = 113; (...)