Two conjectures on squares of primes, involving twin primes and pairs of primes p, q, where q = p + 4

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Abstract. In this paper I make a conjecture which states that there exist an infinity of squares of primes that can be written as p + q + 13, where p and q are twin primes, also a conjecture that there exist an infinity of squares of primes that can be written as 3*q - p - 1, where p and q are primes and q = p + 4.

Conjecture 1:

There exist an infinity of squares of primes that can be written as p + q + 13, where p and q are twin primes.

First five terms from this sequence:

: 5^2 = 5 + 7 + 13;
: 7^2 = 17 + 19 + 13;
: 17^2 = 137 + 139 + 13;
: 67^2 = 2237 + 2239 + 13;
: 73^2 = 2657 + 2659 + 13.

Conjecture 2:

There exist an infinity of squares of primes that can be written as 3*q - p - 1, where p and q are primes and q = p + 4.

First three terms from this sequence:

: 5^2 = 3*11 – 7 - 1;
: 7^2 = 3*23 – 19 – 1;
: 13^2 = 3*83 – 79 – 1.

Note that I also conjecture that the formula 3*q - p - 1, where p and q are primes and q = p + 4, produces an infinity of primes, an infinity of semiprimes a*b such that b – a + 1 is prime and an infinity of semiprimes a*b such that b + a – 1 is prime.