A bold conjecture about a way in which any prime can be written

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Abstract. In this paper I make a conjecture which states that any prime greater than or equal to 5 can be written in a certain way, in other words that any such prime can be expressed using just two other primes and a power of the number 2.

Conjecture:

Any prime greater than or equal to 5 can be written at least in one way as (9*p^2 – q^2)/(2^n), where p and q are primes and n non-null positive integer.

Verifying the conjecture:
(For the first nine such primes)

: 5 = (9*7^2 – 11^2)/64, so [p, q, n] = [7, 11, 6] but also 5 = (9*7^2 – 19^2)/16 so [p, q, n] = [7, 19, 4];
: 7 = (9*5^2 – 13^2)/64, so [p, q, n] = [5, 13, 3];
: 11 = (9*5^2 – 7^2)/16, so [p, q, n] = [5, 7, 4];
: 13 = (9*5^2 – 11^2)/8, so [p, q, n] = [5, 11, 3] but also 13 = (9*7^2 – 5^2)/32 so [p, q, n] = [7, 5, 5];
: 17 = (9*7^2 – 13^2)/16, so [p, q, n] = [7, 13, 4];
: 19 = (9*7^2 – 17^2)/8, so [p, q, n] = [7, 17, 3] but also 19 = (9*13^2 – 37^2)/8 so [p, q, n] = [13, 37, 3] but also 19 = (9*17^2 – 13^2)/128 so [p, q, n] = [17, 11, 7];
: 23 = (9*13^2 – 7^2)/64, so [p, q, n] = [13, 7, 6];
: 31 = (9*11^2 – 29^2)/8, so [p, q, n] = [11, 29, 3] but also 31 = (9*13^2 – 23^2)/32 so [p, q, n] = [13, 23, 5];
: 37 = (9*23^2 – 5^2)/128, so [p, q, n] = [23, 5, 7].

Note:
For the prime 29 I didn’t find primes solution [p, q] up to the denominator 2^12, but surely I conjecture that there exist such solutions.

Note:
For some of the primes we found that they verify also the formula (9*p^2 – q^4)/(2^n).