# Conjecture on numbers n obtained concatenating two primes related to the number of primes up to n (II)

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**Abstract.** In this paper I conjecture that for any prime p, p > 5, there exist q prime, q > p, where p = 30*k + m1 and q = 30*h + m2, m1 and m2 distinct, having one from the values 1, 7, 11, 13, 17, 19, 23, 29, such that the number of primes congruent to m1 (mod 30) up to n, where n is the number obtained concatenating p with q, is equal to the number of primes congruent to m2 (mod 30) up to n. Example: for p = 17 there exist q = 23 such that there are 34 primes of the form 30*k + 17 up to 1723 and 34 primes of the form 30*k + 23 up to 1723.

**Conjecture:**

For any prime p, p > 5, there exist q prime, q > p, where p = 30*k + m1 and q = 30*h + m2, m1 and m2 distinct, having one from the values 1, 7, 11, 13, 17, 19, 23, 29, such that the number of primes congruent to m1 (mod 30) up to n, where n is the number obtained concatenating p with q, is equal to the number of primes congruent to m2 (mod 30) up to n.

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**The least primes q for the first seventeen primes p:**

: q = 11 for p = 7, because there exist 16 primes congruent to 7 (mod 30) respectively 16 primes congruent to 11 (mod 30) up to 711;

: q = 67 for p = 11, because there exist 26 primes congruent to 11 (mod 30) respectively 26 primes congruent to 7 (mod 30) up to 1167;

: q = 17 for p = 13, because there exist 27 primes congruent to 13 (mod 30) respectively 27 primes congruent to 17 (mod 30) up to 1317;

: q = 23 for p = 17, because there exist 34 primes congruent to 17 (mod 30) respectively 34 primes congruent to 23 (mod 30) up to 1723;

: q = 29 for p = 19, because there exist 36 primes congruent to 19 (mod 30) respectively 36 primes congruent to 29 (mod 30) up to 1929;

: q = 43 for p = 23, because there exist 45 primes congruent to 23 (mod 30) respectively 45 primes congruent to 13 (mod 30) up to 2343;

: q = 53 for p = 29, because there exist 54 primes congruent to 29 (mod 30) respectively 54 primes congruent to 23 (mod 30) up to 2953;

: q = 79 for p = 31, because there exist 53 primes congruent to 1 (mod 30) respectively 53 primes congruent to 19 (mod 30) up to 3179;

: q = 59 for p = 37, because there exist 67 primes congruent to 7 (mod 30) respectively 67 primes congruent to 29 (mod 30) up to 3759;

: q = 149 for p = 41, because there exist 541 primes congruent to 11 (mod 30) respectively 541 primes congruent to 29 (mod 30) up to 41149;

: q = 47 for p = 43, because there exist 75 primes congruent to 13 (mod 30) respectively 75 primes congruent to 17 (mod 30) up to 4347;

: q = 89 for p = 47, because there exist 81 primes congruent to 17 (mod 30) respectively 81 primes congruent to 29 (mod 30) up to 4789;

: q = 97 for p = 53, because there exist 90 primes congruent to 23 (mod 30) respectively 90 primes congruent to 7 (mod 30) up to 5397;

: q = 83 for p = 59, because there exist 97 primes congruent to 29 (mod 30) respectively 97 primes congruent to 23 (mod 30) up to 5983;

: q = 73 for p = 67, because there exist 112 primes congruent to 7 (mod 30) respectively 112 primes congruent to 13 (mod 30) up to 6773;

: q = 107 for p = 71, because there exist 882 primes congruent to 11 (mod 30) respectively 882 primes congruent to 17 (mod 30) up to 71107;

: q = 83 for p = 73, because there exist 118 primes congruent to 13 (mod 30) respectively 118 primes congruent to 23 (mod 30) up to 7383.