

A sequence of numbers created concatenating the digit 1 twice with a prime of the form $6k-1$

Abstract. In this paper I show an interesting sequence of numbers created concatenating to the right the digit 1, twice, with a prime of the form $6k-1$ (example of such numbers, terms of this sequence: 12929 and 15353), sequence that has, from the first 50 terms, 21 terms that are primes and 22 that are semiprimes.

Observation:

The sequence created concatenating to the right the digit 1, twice, with a prime of the form $6k-1$ (example of such numbers, terms of this sequence: 12929 and 15353) seems to be particularly interesting; beside the fact that the sequence contains a lot of terms that are primes, many of the composite terms also share a special property: up to the 50-th term of the sequence, all the composites are semiprimes $p*q$, in which case many of these have the property that $p+q-1$ is a prime, or squarefree composites with three prime factors $p*q*r$, in which case many of these have the property that $p*q+r-1$ is a prime.

The sequence of primes:

: 11717, 12323, 14747, 15959, 1107107, 1131131, 1137137,
1167167, 1173173, 1179179, 1191191, 1197197, 1239239,
1263263, 1281281, 1311311, 1317317, 1401401, 1479479,
1503503, 1509509 (...)

The sequence of semiprimes:

: 11111, 12929, 14141, 15353, 18383, 18989, 1113113,
1227227, 1257257, 1269269, 1293293, 1347347, 1353353,
1383383, 1389389, 1419419, 1431431, 1443443, 1461461,
1467467, 1491491, 1521521 (...)

See that:

: 11111 = $41*271$ and $41 + 271 - 1 = 311$, prime;
: 14141 = $79*179$ and $79 + 179 - 1 = 257$, prime;
: 15353 = $13*1181$ and $13 + 1181 - 1 = 1193$, prime;
: 1227227 = $163*7529$ and $163 + 7529 - 1 = 7691$, prime;
: 1383383 = $181*7643$ and $181 + 7643 - 1 = 7823$, prime;
: 1419419 = $461*3079$ and $461 + 3079 - 1 = 3539$, prime;
: 1431431 = $71*20161$ and $71 + 20161 - 1 = 20231$,
prime.

The sequence of squarefree composites with 3 prime factors:

: 17171, 1149149, 1233233, 1251251, 1359359, 1449449 (...)

See that:

: $17171 = 7 \cdot 11 \cdot 223$ and $11 \cdot 223 + 7 - 1 = 2459$, prime;
also $7 \cdot 223 + 11 - 10 = 1571$, prime;
: $1149149 = 17 \cdot 23 \cdot 2939$ and $17 \cdot 23 + 2939 - 1 = 3329$,
prime;
: $1233233 = 19 \cdot 47 \cdot 11381$ and $19 \cdot 47 + 1381 - 1 = 2273$,
prime;
: $1251251 = 17 \cdot 89 \cdot 827$ and $17 \cdot 89 + 827 - 1 = 2339$,
prime;
: $1449449 = 29 \cdot 151 \cdot 331$ and $29 \cdot 331 + 151 - 1 = 9749$,
prime.

Note:

Up to the 50-th term of the general sequence of these numbers, 21 terms are primes and 22 are semiprimes! The longest chain of consecutive terms primes met is of 5 terms: 1167167, 1173173, 1179179, 1191191, 1197197.