Primes obtained concatenating a Poulet number P with (s-1)/n where s digits sum of P and n is 2, 3 or 6

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Abstract. In this paper I conjecture that there exist an infinity of Poulet numbers P such that concatenating P to the left with the number (s(P) – 1)/2, where s is the sum of digits of P, is obtained a prime; also I make the same conjecture for (s(P) – 1)/3 respectively for (s(P) – 1)/6.

Conjecture 1:

There exist an infinity of Poulet numbers P such that concatenating P to the left with the number (s(P) – 1)/2, where s is the sum of digits of P, is obtained a prime.

The sequence of primes obtained concatenating a Poulet number P to the left with (s(P) – 1)/2:

: 91387 obtained from P = 1387 with s = 19;
: 62047 obtained from P = 2047 with s = 13;
: 66601 obtained from P = 6601 with s = 13;
: 98911 obtained from P = 8911 with s = 19;
: 914491 obtained from P = 14491 with s = 19;
: 1219951 obtained from P = 19951 with s = 25;
: 1549981 obtained from P = 49981 with s = 31;
: 12271951 obtained from P = 271951 with s = 25;
: 9314821 obtained from P = 314821 with s = 19.

Conjecture 2:

There exist an infinity of Poulet numbers P such that concatenating P to the left with the number (s(P) – 1)/3, where s is the sum of digits of P, is obtained a prime.

The sequence of primes obtained concatenating a Poulet number P to the left with (s(P) – 1)/3:

: 61729 obtained from P = 1729 with s = 19;
: 42821 obtained from P = 2821 with s = 13;
: 63277 obtained from P = 3277 with s = 19;
: 46601 obtained from P = 6601 with s = 13;

: 629341 obtained from P = 29341 with s = 19;
: 431621 obtained from P = 31621 with s = 13;
: 649141 obtained from P = 49141 with s = 19;
: 6104653 obtained from P = 104653 with s = 19;
: 12129889 obtained from P = 129889 with s = 37.

Conjecture 3:

There exist an infinity of Poulet numbers P such that concatenating P to the left with the number (s(P) – 1)/6, where s is the sum of digits of P, is obtained a prime.

The sequence of primes obtained concatenating a Poulet number P to the left with (s(P) – 1)/6:

: 31387 obtained from P = 1387 with s = 19;
: 31729 obtained from P = 1729 with s = 19;
: 314491 obtained from P = 14491 with s = 19;
: 130121 obtained from P = 30121 with s = 7;
: 331609 obtained from P = 31609 with s = 19;
: 352633 obtained from P = 52633 with s = 19;
: 357421 obtained from P = 57421 with s = 19;
: 465077 obtained from P = 65077 with s = 25;
: 3115921 obtained from P = 115921 with s = 19;
: 3196021 obtained from P = 196021 with s = 19;
: 3228241 obtained from P = 228241 with s = 19;
: 6275887 obtained from P = 275887 with s = 37;
: 3334153 obtained from P = 334153 with s = 19.

Observation:

Note that in all the 31 cases considered above (when a prime was obtained through the defined concatenation) the digits sum of the Poulet number was a prime (7, 13, 19, 31, 37 or a square of a prime, 25). This fact is not a characteristic of Poulet numbers, many of them having as a sum of digits an even or odd composite number.