## **Smarandache Car Primes**

by Jason Earls, author of Red Zen and Heartless Bastard In Ecstasy

In Smarandache Sequences Vol. I at the Smarandache web site[1], item #12 is a "Smarandache car" in which the figure of a vehicle can be seen as a picture outlined in a block of digits. In this note I report on some primes that were found using the "Smarandache car" as the initial segment of their decimal expansions.

Numbers that enjoy certain properties such as primality and that also contain a strong visual component is a concept closely related – in my mind at least – to that of "concrete poetry." Poems dubbed "concrete" are those in which the typographical arrangement of words or symbols play a direct role in conveying the "meaning" of the poem[2]. A famous example is George Herbert's (1593-1633) poem "Easter Wings" in which its two stanzas are wing-shaped[3].

Regarding "concrete mathematics" (which is what I am defining here), there is of course no meaning to relate in the numbers presented. However, there is an element of humor in finding primes that have the figure of a vehicle pictured in their digits when they are formatted in a certain way. Hence, this note is rather lighthearted, but nevertheless we offer the following primes and present a conjecture.

The first Smarandache car prime:

Notice the row of 1s placed along the top of the Smarandache car figure, which makes it different from the original image seen in [1]. Also the digits outlining the car have been bolded. This prime was found by treating the picture of the Smarandache car as an integer, Z, then testing  $Z * 10^n + 1$  for primality using the freely available PFGW program[4]. The values of n that make  $Z * 10^n + 1$  prime are 300, 307, 313, 1511, and 1836, with no more terms up to 4500.

The motivation behind multiplying Z by  $10^n + 1$  was that the addition of zeros and a 1 would enable any probable prime P to be easily provable if at least 33% of P-1 could be factored. In other words, we hoped to give P-1 enough 2s and 5s to make it easily provable. Yet the first three values found: 300, 307, 313, did not allow  $Z * 10^n$  to have enough small factors and so they had to be certified with the online ECM factorization applet written by Dario Alpern[5]. The other two primes were easily provable since more than 33% of P-1 could be factored.

Conjecture: There are infinitely many Smarandache car primes.

**Questions:** What other "concrete" numerical figures can be designed that simultaneously have mathematical properties? Can any squares, perfect powers, or Niven numbers be found that display "pictures" of any kind in their digits?

## References

- 1. Smarandache Sequences, Vol. I, http://www.gallup.unm.edu/~smarandache/SNAQINT.txt
- 2. Wikipedia, "Concrete Poetry," http://en.wikipedia.org/wiki/Concrete poetry
- 3. RPO, George Herbert, "Easter Wings", http://eir.library.utoronto.ca/rpo/display/poem973.html
- 4. PrimeFormGW (PFGW), Primality-Testing Program Discussion Group, http://groups.yahoo.com/group/primeform/
- 5. Dario Alpern, Factorization Using the Elliptic Curve Method Applet, http://www.alpertron.com.ar/ECM.HTM

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His fiction and mathematical work have been published in Red Scream, Scientia Magna, Wretched & Violent, Mathworld, Chiaroscuro, three of Clifford Pickover's books, Switchblade, Dogmatika, Neometropolis, Prime Curios, the Online Encyclopedia of Integer Sequences, OG's Speculative Fiction, AlienSkin, Escaping Elsewhere, Werewolf, Recreational and Educational Computing, Thirteen, Theatre of Decay, Nocturnal Ooze, Prime Curios, Bust Down the Door and Eat All the Chickens, Swallow's Tail, and

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