Scan A5234

Dubner

Lefthand page

(a half page

only)

A5234

A NEW PRIMORIAL PRIME

HARVEY DUBNER
Dubner Computer Systems, Inc.
6 Forest Avenue
Paramus, New Jersey 07652

In a fairly recent article on factorial and primorial primes I summarized in four tables the known primes of the forms $N! \pm 1$ and $P\# \pm 1$, $P\#$ being defined as the product of all primes up to and including P [1]. Unfortunately, the table for $P\# + 1$ primes had several manuscript errors. Instead of just sending in the corrections, I thought that I would add some additional information by extending the search limit, never really expecting to find another prime with only a few days of testing. But as Lady Luck would have it, we hit a 25-to-1 shot and discovered a new primorial prime:

$$18523\# + 1 \qquad 8002 \text{ digits}$$

The corrected and updated Table 1 in the reference article now becomes as shown below.

Reference:

1. H. Dubner, Factorial and Primorial Primes, *Journal of Recreational Mathematics, 19*:3, pp. 197-303, 1987. [NOTE: Page 197 of this reference has a minor typographical error: the first primorial prime listed has 4951 digits, *not* 4591.]

Table 1. The Size of $P\#$ 1 Primes ($P\# + 1 = 2 \times 3 \times 5 \times 7 \times \ldots \times P + 1$)

P	Number of Digits	P	Number of Digits	P	Number of Digits	P	Number of Digits
2	1	11	4	1021	428	4787	2038
3	1	31	12	2657	1115	11549	4951
5	2	379	154	3229	1368	13649	5862
7	3	1019	425	4547	1939	18523	8002
				Tested up to P = 19051, 8231 digits			

MORE 1989 "PRIME" FACIE

HARVEY DUBNER
Dubner Computer Systems, Inc.
6 Forest Avenue
Paramus, New Jersey 07652-5214

$1989 \times 10^N + 1$ is prime for N = 1, 2, 6, 12, 13, 46, 64, 70, 163, 167, 414, 478, 745, 884, and no others for $N \leqslant 1989$. Some examples:

N	Prime
1	19891
2	198901
6	1989000001
12	1989000000000001
13	19890000000000001
46	19890000000000000000000000000000000000000000000001

and so on . . . .

Also, $1087 \times 10^{1990} + 1 = 10870_{1989}1$ is a prime which ends in 1989 zeros and a 1. It is the smallest such prime.