Seventeen Primes in Arithmetic Progression

By Sol Weintraub

Abstract. Two sets of primes in arithmetic progression are listed. One is a set of 17 primes and the second is a set of six consecutive primes.

A computer search revealed the following sequence of 17 primes in arithmetic progression:

First term: 3 430 751 869
Last term: 4 827 507 229
Difference: 87 297 210

The common difference equals \(2 \cdot 3^3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17 \cdot 19\).

The previous record of 16 primes in arithmetic progression was found by S. C. Root in 1969 [1]. I have found 7 other sequences of 16 primes (the smallest starting at 13 816 843 with a common difference of 236 366 130), but the foregoing is the only case of more than 16 primes known to me.

On a related problem I found a second set of six consecutive primes in arithmetic progression near \(10^{15}\):

\[
999\,900\,067\,719\,989 + 30t, \quad t = 0(1)5.
\]

The smallest such sextet was found by Lander and Parkin [2] at 121 174 811 + 30t, \(t = 0(1)5\).

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