

The result (d) was another example of the converse of Fermat's theorem. It is easy to see that the 15 integers between the two primes

$$p_1 = 2^{61} - 1 \quad \text{and} \quad p_2 = 2^{61} + 15$$

are composite, being multiples of small primes ≤ 13 . Hence, p_1 and p_2 are consecutive primes, and constitute the largest pair of consecutive primes known.

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¹ A. J. C. CUNNINGHAM & H. J. WOODALL, *Factorization of $y^n \pm 1$* , London, 1925.

QUERY

34. ARCHIMIDES CATTLE PROBLEM.—Has any attempt been made to use one of the modern electronic computing devices to get a solution of the famous cattle problem¹ of Archimedes?

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¹ See L. E. DICKSON, *History of the Theory of Numbers*, Washington, 1920 and New York, 1934, v. 2, p. 342–345.

QUERIES—REPLIES

44. TABLES OF $\sin nx/\sin x$ (Q16, v. 2, p. 61).—A table of this function “for large integral values of n , say up to 100, and for values of x in radians” would be impossibly large if it were interpolable in x . Millions of entries would be necessary to carry the table as far as $x = 10$ with $8D$. Since isolated values of this function can be obtained with a little trouble from a good table of $\sin x$ it is not surprising that there is no such table in print. For fixed x , however, there are a number of small tables of what is essentially $\sin nx/\sin x$. Two examples may be cited, though they do not correspond to real values of x . For $x = \arccos(-i/2)$ we have

$$\sin nx/\sin x = i^{1-n}F_n,$$

where F_n is the n -th term of the Fibonacci series, which is tabulated as far as $n = 128$ [*MTAC*, v. 2, p. 343]. For $x = \arccos(-3i/\sqrt{2})$ we have

$$\sin nx/\sin x = (i\sqrt{2})^{1-n}(2^n - 1)$$

the values of which can be found easily from a table of powers of 2.

As is well known, $U_n = \sin nx/\sin x$ is a special kind of LUCAS¹ function and can be computed recurrently by the formula

$$U_{n+1} = 2 \cos x U_n - U_{n-1}.$$

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¹ É. LUCAS, *Théorie des Nombres*, Paris 1890, p. 319.

CORRIGENDA

V. 3, p. 362, l. —1 for RMT 593 read RMT 592.

V. 3, p. 554, l. 3, for 4–17, read 3–16.

V. 3, p. 559, l. 4, for 454 read 554.

V. 3, p. 562, l. 30, for NICHOLAS DE CUSA read NICHOLAS DE CUSA.

V. 3, p. 563, l. 6, for fifteenth read thirteenth.

Nos. 28, 29, cover 3, interchange lines J and I.