New Seq 14 1953 3009, 3010 two seqs

...sition of n and k into powers of primes, then

$$n_i \leq k_i+1 \quad \text{if} \quad i>0$$
$$n_0 \leq k_0+2 \quad \text{if} \quad k_0>0$$
$$n_0 = k_0 \quad \text{if} \quad k_0=0.$$

... $(n, k)=1$, then n is an odd squarefree num-... ...ntly large n are of the form $n=mpq$ with ... $p<q$, p and q primes. The number of ... than x is $O(k^6+2^{-t}kx)$, where $t=(\log x)^{1/2}$. ...d that this is really $O(kx^\theta)$ for some $\theta<1$.

D. H. Lehmer (Berkeley, Calif.).

HALL J S

... **A remark on the primeness of Mersenne** ... London Math. Soc. 28, 285–287 (1953).

Suggests a modification of the Lucas test for ... Mersenne numbers $M_p=2^p-1$. He deplores ... with which the sequence

$$4, 14, 194, 37634, \cdots, u_{k+1}=u_k^2-2$$

(rapidity with which)

...suggests that the sequence be replaced by 3, 147, 1383123, 489735485064147, $\cdots$, h_{k+1}

$$=h_k+(2^{k-1}h_k)^2, \quad h_3=3$$

with the condition that $h_{p-3}+8$ be divisible by M_p. The ... No practical value, however, inasmuch as the ...sequence must be taken modulo M_p and the ...pidity of increase disappears. The more ...rence for the h's would appear to be the only ... new test.

D. H. Lehmer.

...ques. **On prime numbers and perfect num-...** ...a Math. 19, 35–39 (1953).

...not... sum of the divisors of k. The author ... sum

$$S_p=\sum_{k=1}^{n-1}k^p\sigma(k)\sigma(n-k)$$

... identities

$$n^2(n-1)\sigma(n)=18n^2S_0-60S_2,$$

$n^2(n-1)$ ...

...l's dif...

first method he uses factorisation in $K(\sqrt{-k})$ in certain cases when $h(\sqrt{-k})\equiv 0 \pmod 3$. In the second, use is made of a representation $k=3a^2+rb^3$, applying cubic reciprocity to the equation in the form $x^3-rb^3=y^2+3a^2$. Three theorems are proved, and applications of these theorems are given. The equation is impossible for $k=24$, 31, and 77. The same principles can be used to determine other insoluble equations ($k=92$, -60).

W. Ljunggren (Bergen).

Bronkhorst, Pieter. **Over het aantal oplossingen van het stelsel diophantische vergelijkingen:**

$$\left.\begin{matrix} x_1^2+x_2^2+\cdots x_s^2=n \\ x_1+x_2+\cdots x_s=m \end{matrix}\right\} \text{voor } s=6 \text{ en } s=8.$$

[On the number of solutions of the system of Diophantine equations:

$$\left.\begin{matrix} x_1^2+x_2^2+\cdots x_s^2=n \\ x_1+x_2+\cdots x_s=m \end{matrix}\right\} \text{for } s=6 \text{ and } s=8.]$$

Thesis, University of Groningen, 1943. North Holland Publishing Co., Amsterdam, 1943. i+68 pp.

Let s be a fixed positive integer; let $n>0$ and m be variable integers, and let $r(n, m)$ denote the number of integral solutions of

$$x_1^2+x_2^2+\cdots+x_s^2=n, \quad x_1+x_2+\cdots+x_s=m.$$

The function $r(n, m)$ has been investigated by H. D. Kloosterman [Math. Ann. 118, 319–364 (1942); these Rev. 5, 33; 9, 735] for odd squarefree s, and he gave explicit expressions for $r(n, m)$ when $s=3$, 5, or 7. In this thesis, the author obtains such explicit equations in the even cases $s=6$ and $s=8$.

K. Mahler (Manchester).

Rivier, William. **A propos de la résolution en nombres entiers de l'équation à coefficients entiers $rx+sy=m$.** Bull. Sci. Math. (2) 77, 51–55 (1953).

Let $r>0$, $s>0$, $k\geqq 0$ be fixed integers with $(r, s)=1$. and ...

```
[2 LA *DSA LE*21 LE +PSE LXX]SX
S*2SA 3SE LXX
    147
    1383123
    489735485064147
    2455970256189597181900412387757 63
    2470621142748363003811273051471025644677519245223870622914 01
    805739987
    1000074253270258005241620519857647091726867208707903083465 21
    7610738967032742450466216874244113668163296920709299716733 08
    16026285740638603480 83
```

3009 = N1286.5 (38)

```
[illegible] - P SA LXX]SX 4SA LXX
    14
    194
    37634
    1416317954
    2005956546822746114
    4023861667741036022825635656102100994
    1619146272111567178177755907012051366495859012549915851432 93
    08740975788034
    2621634650492785145260593695575630392136478775595245459119 06
    0053495557738312369350159562818489334269993079824186649[illegible]
    94390160891939660729758515 4
OUT OF SPACE.
```

3010 = N1417.5