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Guy letter

89-09-12

one sentence

3 pages

9/12/89

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89-09-12

Dear Neil,

I've managed to restrain myself from firing off another missive to you for quite some time, but I have some notes towards such, so here goes.

1. I expect JHC has told you about quasi-G.P.'s. Start with integers a_0, a_1 ; $a_0 < a_1$; $a_0 \perp a_1$ and define a_{n+1} as the nearest integer to a_n^2/a_{n-1} . E.g. 2,3,4,5,6,7, ... or 2,3,5,8,13,21, according as you throw down or throw up at $4\frac{1}{2}$. I believe that if $a_0 = 10$, $a_1 = 119$, the sequence satisfies a fourth order recurrence until term 847 or thereabouts, by which time it's about 1000 digits, and it turns out to be 1 out! The 2nd edition of Sloane will need to be in several volumes if it's to distinguish between the two sequences.

2. I'm not sure that I sent you the *second* SLSN. It will appear in *Math. Mag.* and leans heavily on Sloane. I enclose a preprint.

3. Therein, courtesy of Gerry Myerson, is continued your sequence #581. See Answer 73 on p. 22.

4. See also Answer 44 on p. 17. I hope that this is not too rude to you. I expect it was the P.S. to your 88-12-16 letter that gave me the information. I wrote to Bateman to see if he knew of anything more that had been published on E1910, since *A.M.M.* 75(1968)80, but he didn't have enough info. to be sure.

5. Not all the sections of this letter are about sequences. I expect to visit J.H.C. in the latter half of October; he wants to rewrite several sections of the *Book of Numbers*.

Groups

Neil Sloane *9/12/89*

✓
✓
✓
✓
✓

6. I learned, quite accidentally, that Coxeter and Jörg Wills were both (also) reviewing the Conway-Sloane book. Coxeter sent me a copy of his review. It was interesting to compare and contrast. ✓

7. About a year ago, Terence Brenner[#] submitted a conjecture to the Unsolved Problems sections of the *Monthly*: that the number of 2×2 matrices with integer entries, mod n and non-zero determinant is $n^4 - n^3 - n^2 + n$. This was withdrawn, as he & a colleague proved it for n prime & were getting more results, so they may have published a paper on it by now. The sequence, 0,6,48,168,480,966, ... is not in Sloane. To save copying & copying errors, I enclose a sheet from one of Brenner's letters. } 1353

Have you done 5.13 yet?

That's about all for now, but as soon as I send, I'm sure lots of things will crop up. ✓

Best wishes.

Yours sincerely,

Richard.

Richard K. Guy

RKG:jm

encl: Brenner sheet
2SLSN

T. Brenner

BRB89

LIST

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```
10 T = 0
20 FOR N = 3 TO 37
30 FOR A = 0 TO N - 1
40 FOR B = 0 TO N - 1
50 FOR C = 0 TO N - 1
60 FOR D = 0 TO N - 1
70 IF (A * C = B * D) OR A * C - B * D = INT ((A * C - B * D) / N) * N THEN
    90
80 T = T + 1
90 NEXT D
100 NEXT C
110 NEXT B
120 NEXT A
130 PRINT N",ORDER IS "T
135 T = 0
140 NEXT N
```

IRUN

```
3,ORDER IS 48
4,ORDER IS 168
5,ORDER IS 480
6,ORDER IS 966
7,ORDER IS 2016
8,ORDER IS 3360
9,ORDER IS 5616
10,ORDER IS 8550
11,ORDER IS 13200
12,ORDER IS 17832
13,ORDER IS 26208
14,ORDER IS 34566
15,ORDER IS 45840
16,ORDER IS 59520
17,ORDER IS 78336
18,ORDER IS 95526
19,ORDER IS 123120
20,ORDER IS 147240
21,ORDER IS 181776
22,ORDER IS 219846
23,ORDER IS 267168
24,ORDER IS 307488
25,ORDER IS 372000
26,ORDER IS 433446
27,ORDER IS 505440
28,ORDER IS 580776
29,ORDER IS 682080
30,ORDER IS 762150
31,ORDER IS 892800
32,ORDER IS 999936
33,ORDER IS 1138368
34,ORDER IS 1284486
35,ORDER IS 1444800
36,ORDER IS 1596456
37,ORDER IS 1822176
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