

emulation, 60CPS superb printer. Includes spare ribbons, daisywheels and tractor feed. 2yrs old. £800. (0600) 890 974 Coldrich.

### Sinclair

● **Sinclair QL.** JS-ROM, 128K, serial printer, excellent condition, manuals, original boxes. Psion package +20 microdrive cartridges. 35 magazines and books. £90. Tel: Norman (061) 336 9406 Manchester.

### Software

● **PC-Write Printer Driver.** For Brother M14/15/17 09 printers with LQ1/200 font card. £5. Tel: (095383) 4917.

### Tandy

● **Video Genie 64K.** Z80 based dual Cumana 5 1/2" drives, centronics 737 printer, 12" b/w monitor, software includes LDOS word processor, database Accel Edibass. Good condition. £150 ono. Tel:

(0306) 886354 after 6pm.

● **Tandy Model 200 TRS80.** Full 72k memory, modem and acoustic coupler. New condition with disk drive and discs. New condition handbooks. Complete portable system £500. Tel: Maidenhead (0628) 24929.

● **Tandy Model 600 Portable Computer.** Inbuilt 3 1/2" disk drive, 80 col screen, Exchange for Tandy model 200. Tel: John 9-5pm weekdays (01) 539 4397 or after 6pm on (01) 478 7868 any day.

● **TRS-80 Mod 1 Lev2 16k.** With VDU. DMP-106 printer, tape recorder, light pen, connecting leads, lots of software, books, magazines, all in excellent condition. £230 ono. Please Tel: (0253) 893608 after 5pm.

### Wanted

● **Triumph Adler** Alphatronic P2 disk drive BASF 6106. Or complete micro for spares. Richard Finn, 30A Stockton Lane, York, YO3 032. Tel: day

(0904) 430000 ex 5820).

● **Macintosh Software.** Wanted By Private collector. Particularly Cobol, Fortran, Express but anything considered. Thunderscan also wanted. Tel: (05827) 69152 or write to R Bhattacharia, 3 Wensley Close, Harpenden, Herts AL5 1R2.

● **Olivetti M20.** Urgently required for spares, especially memory board and hard disk add-on. Walker (0727) 62837 eves.

## LEISURE LINES

### Brainteasers courtesy of JJ Clessa.

#### Quickie

No prizes, no answers.

A certain young lady I know refuses to reveal her age. However, she did say that if you multiply the two digits of her age together, and double the result, the answer you get is one more than her age. How old is she?

July 88

#### Prize Puzzle

Rather easy, this one.

I bought a book the other

day and discovered that a sheaf of pages were missing. I added up the numbers of the pages that were missing and the total came to 3500.

What are the missing pages?

Answers on postcards only, please, to arrive not later than 31 July 1988.

Send your entry to: Leisure Lines Prize Puzzle — June, Personal Computer World, VNU House, 32-34 Broadwick Street, London W1A 2HG.

#### Prize Puzzle, April

First, a word about the four 7's quickie. I still do not have a solution to '26' and am convinced that it can't be done. Those who claim solutions invariably use logs or the operator 'e', or introduce symbols, which can hardly be described as standard.

So, it looks like '25' is the limit — one reader quotes Rouse-Ball (*Mathematical Recreations and Essays*) which

also states that '25' is the maximum.

Now to the problem that I set for April. It was a long-winded job by computer in most cases, and the total number of different integers which could be made was 9858. The value in the 5000th position was 4381633.

The winner is Mr H McCormick of Sheffield. Congratulations, Mr McCormick, your prize is on its way.

## NUMBERS COUNT

### Mike Mudge examines JG Triples, primitives and problems.

**Definition:** Two or more triples of positive integers are said to be JG Triples (the notation arising from the Latin 'Jusdem Generis' meaning 'of the same kind') if they have the same sum and the same product. For example (14, 50, 54); (15, 40, 63); (18, 30, 70); (21, 25, 72) have a common sum equal to 118 and a common product equal to 37800 and thus constitute a quadruple of JG Triples.

**Note** If (a, b, c) and (p, q, r) are JG Triples then so are (ka, kb, kc) and (kp, kq, kr) where k is any positive integer. Hence we imply the term 'primitive' when referring to n-tuples of JG Triples, there being no common factor throughout all of them.

James G Mauldon asked how many different JG Triples exist (c.1979). For quadruples the smallest common sum is 118 (illustrated above) while the smallest common product appears to be 25200 arising from (6, 56, 75); (7, 40, 90); (9, 28, 100); (12, 20, 105). The only quintuplet known to the writer is (6, 480, 495); (11, 160, 810); (12, 144, 825); (20, 81, 880); (33, 48, 900) with common sum 981 and common product 1425600.

However, Lorraine L Foster

and Gabriel Robins (*American Mathematical Monthly*, vol 89, 1982, problem E 2872) quote results including the least sum for a quintuplet as 185 and for a sextuplet as 400. Also, a decuplet with common sum 1326000 and common product given by  $2^7 \cdot 3^6 \cdot 5^4 \cdot 7^2 \cdot 13^3 \cdot 17^3$ . Further, they conjecture that there are infinitely many primitive n-tuples of JG Triples for any n greater than 4.

**Note** An infinite family of primitive quadruples of JG Triples is generated by (16ka, bc, 15d); (10ka, 4bc, 6d); (15kb, ad, 16c); (6kb, 4ad, 10c) where  $a = k + 2$ ,  $b = k + 3$ ,  $c = 2k + 7$  and  $d = 3k + 7$ .

#### Problems

(i) Construct quadruples, quintuplets and so on of JG Triples verifying in the process the results quoted, in particular those of Foster and Robins regarding minimal sums.

(ii) Conjecture concerning the behaviour of the minimal sum, the minimal product and the number of n-tuples of JG Triples less than a given  $N_0$ .

(iii) Investigate the natural extension from JG Triples to JG Quadruples.

A reference to *PCW*, July 1983 and December 1983 may prove helpful. Any other refer-



ences are rather difficult to obtain.

Readers are invited to send their attempts at some, or all, of the above problems to Mike Mudge, 'Square Acre', Stourbridge Road, Penn, South Staffordshire WV4 5NF, tel (0902) 892141, to arrive by 1 September 1988. It would be appreciated if such submissions contained a brief description of

the program and a summary of the results obtained in a form suitable for publication in *PCW*.

These submissions will be judged using subjective criteria, and a prize will be awarded by *PCW* to the 'best' contribution received by the closing date.

Please note that submissions can only be returned if a suitable stamped addressed envelope is provided.

### Review, January

The apparent abstract nature of this problem deterred many readers. However, an examination of the paper by Shen Lin, *Computational Problems in Abstract Algebra*, Pergamon Press 1970, pp365-370 will reveal the wealth of empirical results obtained by the author nearly 20 years ago and also provide references for background reading. The most readily available is JL Brown: Note on a complete sequence of integers (*American Mathematical Monthly* vol 68, 1961, pp557-560).

One computer program was received which successfully implemented the associated theory and produced T(S), in principle for any sequence de-

# NUMBERS COUNT

defined algebraically, though it must be said that slowness of execution limited the results obtained to quadratics and triangular numbers. Consequently upon this performance, this month's prizewinner is Gareth Suggett of 31 Harrow Road, Worthing, Sussex BN11 4RB. Readers may be sufficiently curious to request

copies of Gareth's theory and coding with a view to accelerating his algorithm and reproducing in full the results of Shen Lin.

Those readers who are still deterred by the mathematical background required for some 'Numbers Count' problems are encouraged to read *Mathematical Puzzling* by Tony Gardin-

er, Oxford University Press 1987, price £4-95, where a considerable spectrum of puzzles are discussed without the need for either mathematical prerequisites or a computer!

**Mike Mudge** welcomes correspondence on any subject within the areas of number theory

and other computational mathematics. Particularly welcome are suggestions, either general or specific, for future Numbers Count articles; all letters will be answered in due course.

Isolated readers can be put in contact with others sharing the same interests. However, greater efficiency regarding published problems should result from contacting the prizewinner.

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12h; runs on a Spectrum  
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Mighty Micro; Manchester  
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Sun: 24hrs; 3/1275; Fido/Opus  
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(061) 427 1596 24 hrs; 3/1275  
Pyramid; Leigh; Lancs  
(0942) 609 611 24 hrs; 3;  
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24 hrs; 1275v

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24 hrs; 1275v  
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(0463) 231 339 24 hrs; 3/1275  
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(0924) 442598 24 hrs; 1275v  
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(0506) 38 526 24 hrs; 300  
People's Palace; Glasgow  
(041) 956 6537 Daily 6pm-8am  
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### ABBREVIATIONS

3 V.21 (300 baud)  
1275 V.23 (1200/75)  
12 V.22 (1200/1200)  
24 V.22bis (2400/2400)  
3-12 V.21, V.22, V.23  
3/1275 V.21, V.23  
3-24 V.21, V.22, V.23, V.22bis  
v viewdata  
s scrolling (not viewdata)  
h half duplex  
r/b ring back  
M MNP error correction  
\* Fidonet node  
Most scrolling systems are 8 bits,  
no parity, 1 stop bit.  
Most viewdata systems are 7 bits,  
even parity, 1 stop bit