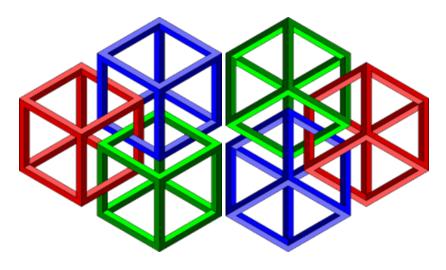# MATHS

PUZZLE BOOK

VOLUME ONE

= for keen puzzlers aged 9 to 105! =

◊   The reason for producing this Puzzle Book is because I am aware that in this era of the "virus", periods of boredom will creep in and the puzzles can be done as light relief.

◊   This document is not connected to any organisation and there are no financial implications involved. This is me giving back to Society which has treated me well.

◊   This booklet can be printed in black and white or colour and it can be printed page by page if you do not want to print the whole document.

◊   I have a great deal more material to consider for further publications. Do let me know which are your favourite puzzles and I will include more in the next edition.

Puzzles created or adapted by Douglas Buchanan

FILL IT IN!

Place the list of numbers on the right hand-side into the grid.

				4			
				8			
				6	4	7	9

11	87	557	6479
19	99	693	7882
25	241	744	7999
48	323	892	8795
52	359	1255	18997
53	468	2368	43418
54	532	4589	
73	546	5271	

ADD UP TO SEVEN

Find consecutive numbers, horizontally, vertically and diagonally which add up to SEVEN

2	1	1	1	3	1	2	3	3	2	1
3	1	3	3	1	3	2	1	2	3	3
3	1	3	3	1	1	2	2	3	2	3
3	1	1	2	1	1	3	2	2	3	2
3	2	2	1	3	3	3	2	3	1	3
3	1	3	2	2	3	3	2	2	3	2
2	2	3	3	2	3	1	1	2	3	2
3	2	3	2	2	2	3	3	1	2	1
1	1	1	1	3	1	1	1	1	1	2
2	3	3	2	2	2	3	1	2	2	3
2	2	2	2	1	3	2	3	1	1	1
1	1	2	1	3	2	2	2	3	3	2

SEARCHING FOR WORDS CONNECTED WITH SHAPE

There are 18 words which are related to Shape. Can you find them all?

```
G A V P A R A L L E L O G R A M P U
P A R A L L E L L I N E S T N T R C
E Q U I L A T E R A L G V F F Q D C
D R B D K O D U O D E C A G O N L N
S H K H E P T A G O N D K M M R Z O
C O O C T A G O N S E P T A G O N N
A M C I G N W H E X A G O N X N Y A
L B S Q U A R E T R A P E Z I U M G
E U I S O S C E L E S Q K W F C W O
N S C L D I A G O N A L L I N E S N
E N G T R I A N G L E H L S J E A R
W C W R E C T A N G L E R O L S R F
```
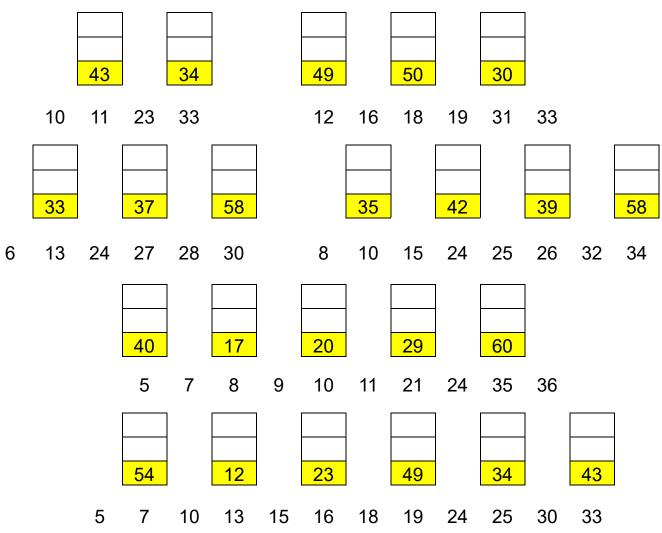
MAKE 24

Using ALL four numbers write a number sentence where the result is 24. You can only use the simple operations addition, multiplication, subtraction and division.

2	3	10	9	
5	3	7	15	
11	5	8	10	
8	3	2	10	
4	5	11	3	

ADDING PAIRS

From the list of numbers find pairs which add up to the totals as shown

43	**34**	**49**	**50**	**30**

10   11   23   33   12   16   18   19   31   33

33	**37**	**58**	**35**	**42**	**39**	**58**

6   13   24   27   28   30   8   10   15   24   25   26   32   34

40	**17**	**20**	**29**	**60**

5   7   8   9   10   11   21   24   35   36

54	**12**	**23**	**49**	**34**	**43**

5   7   10   13   15   16   18   19   24   25   30   33

COUNTING DOWN!

Similar to "Make 24" but you do not have to use all the numbers. You can only use the simple operations addition, multiplication, subtraction and division.
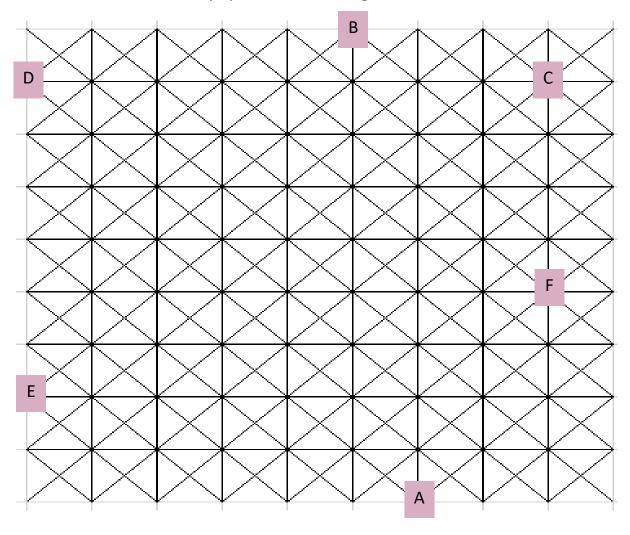
	50	7	6	3	9	4	285
Ans:							
	25	2	3	10	7	8	492
Ans:							
	50	8	7	7	5	4	115
Ans:							
	100	7	10	3	4	5	172
Ans:							
	50	6	5	10	9	1	296
Ans:							

SILLY SPIDER'S ROUTES

Silly Spider walked on a net of wires and started at different points.
Which dot did Silly Spider reach having followed the routes below

START A - North 2 corners; North-West 3 corners; North 2 corners; East 2 corners; South 2 corners; North-East 2 corners; South 3 corners; East 1 corner

START E - North 4 corners; South-East 1 corner; South 1 corner; East 3 corners; South-East 2 corners; East 1 corner; North 7 corners; West 2 corners

START D - North 1 corner; East 4 corners; South 4 corners; South-East 2 corners; South 1 corner; East 1 corner; North 4 corners; North-East 1 corner; North 1 corner

START F - South 2 corners; West 7 corners; North-East 2 corners; North 2 corners; South-East 3 corners; North 3 corners; North-East 1 corners; West 1 corner; North-West 1 corner; South 2 corners; West 3 corners; North-East 3 corners

START B - South 1 corner; West 2 corners; South-West 1 corner; South 2 corners; East 2 corners; South-East 2 corners; South 1 corner; North-West 2 corners; West 2 corners; South 1 corner; South-West 1 corner; North 4 corners; North-West 1 corner; North 1 corner.

NUMBER BOGGLE

Moving from one square to another either horizontally, vertically or diagonally

try and make the target value by adding and / or subtraction.

There are many combinations. Can you find them all?

Example 1: 8 + 5 - 2 = 11 Example 2: 7 + 6 + 3 + 3 = 19

11	8	7	19
2	5	8	4
3	19	3	19
2	7	6	3

14	4	19	10
8	5	11	2
11	8	7	4
15	4	4	8

1	2	16	5
13	14	2	19
17	4	9	4
9	8	13	18

18	2	7	13
4	2	8	2
7	14	4	10
2	10	3	5

13	6	5	14
5	4	10	8
5	17	2	16
8	4	5	10

10	3	10	20
6	10	2	5
8	18	8	14
5	7	4	4

HAPPY FARMERS

Four happy farmers were having a coffee in a Milk Parlour and they were setting each other riddles. Try and work out how many animals, birds, fish or insects there were in each riddle

Farmer Tractor said: "On my farm I have goats and turkeys. I can see 12 heads and 38 legs. How many goats and turkeys do I have?"

Farmer Plough said: "I have rabbits and ducks on my farm and I can see 23 heads and 74 legs. How many rabbits and ducks do I have?"

Farmer Baler said: "On my farm I have geese, pigs and salmon. I can see 25 heads and 56 legs. How many geese, pigs and salmon do I have?"

Farmer Harrow said: "In my hen house I saw my hens, of course, spiders and wasps. I saw 16 heads and 70 legs. How many hens, spiders and wasps did I see?"

ORDERING CARDS

By reading through the instructions put the numbers in the correct order.

Using playing cards or numbered cards will make it easier to solve.

None of the numbers are in their actual positions.

1 cannot be the first card, 2 cannot be the second card and so on.

A: Cards 1 2 3 4

The middle two cards add up to 4

B: Cards 1 2 3 4 5

Card 2 and Card 4 equal 12 when multiplied together

Card 1 and Card 5 are odd numbers

C: Cards 1 2 3 4 5 6

Card 1 and Card 2 as well as Card 5 and Card 6 add up to 8

Card 3 and Card 4 equal 4 when multiplied

Card 1 and Card 4 add up to 3

D: Cards 1 2 3 4 5 6 7

Card 3 and Card 4 as well as Card 6 and Card 7 add up to 5

The 1 is 3 places away from the 5 as well as the 3

Card 5 divided by Card 6 equals Card 7

E: Cards 1 2 3 4 5 6 7 8

The 8 is to the right of the 1, the 4 and the 7

The 2 is to the left of the 3, the 5 and the 6

Card 1 and Card 2 equal Card 6 when added together

Card 3, Card 6 and Card 8 are prime numbers

							6
							1
							1
							3

27	81	772	2411
56	93	816	4228
61	96	872	5641
62	97	886	6113
64	183	891	18634
67	294	892	25462
69	557	924	
72	562	933	

FILL

IT

IN

ADDITION TRAILS

Work you way through the maze starting at START ending with the correct total.

You can only move horizontally or vertically

START	4	7	3	1
10	5	9	7	4
10	9	7	9	**36**

START	10	2	3	10
3	5	3	6	10
4	1	5	1	**14**

START	3	9	9	5
8	1	9	10	7
7	7	2	8	8
8	1	2	4	**39**

START	2	5	8	5
4	1	10	4	6
8	9	2	1	2
10	10	10	7	**25**

START	8	1	10	4
4	3	3	4	10
5	10	5	5	8
1	7	2	6	**49**

SOLUTIONS

ADD UP TO 7: MAKE 24; COUNTING DOWN; NUMBER BOGGLE; ADDITION TRAILS: there are many combinations. Ask somebody to check them or use a calculator. **SHAPE WORDS**: DECAGON, DIAGONALLINES, DUODECAGON, EQUILATERAL, HEPTAGON, HEXAGON, ISOSCELES, NONAGON,, OCTAGON, PARALLELLINES, PARALLELOGRAM, RECTANGLE, RHOMBUS, SCALENE, SEPTAGON, SQUARE, TRAPEZIUM, TRIANGLE. **ADDING PAIRS**: 10 33, 23 11; 16 33, 31 19, 12 18; 27 6, 13 24, 30 28; 10 25, 8 34, 15 24, 32 26; 35 5, 7 10, 9 11, 8 21, 36 24; 24 30, 5 7, 13 10, 33 16, 19 15, 25 18. **SILLY SPIDER**: A to F; E to B; D to C; F to B; B to D **HAPPY FARMERS:** 7 goats 5 turkeys; 14 ducks 9 rabbits; 6 geese 11 pigs 8 salmon; 8 hens 3 spiders 5 wasps. **ORDERING CARDS:** 4312 ; 54231; 264135; 5741623; 41782563