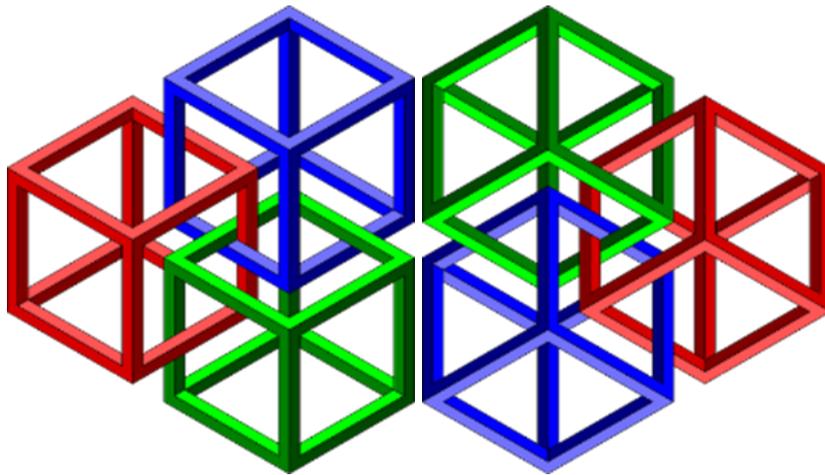# MATHS

PUZZLE BOOK

VOLUME TWO

= 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

COUNTING DOWN!

Make the total on the left - you do not have to use all the numbers.

You can only use the operations addition, multiplication, subtraction and division.

	75	6	8	2	6	9	482
Ans:							
	100	1	6	2	4	5	451
Ans:							
	25	9	4	9	10	4	136
Ans:							
	75	2	3	1	9	9	214
Ans:							
	50	10	6	1	7	10	465
Ans:							

SEARCHING FOR WORDS CONNECTED WITH MEASUREMENT

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

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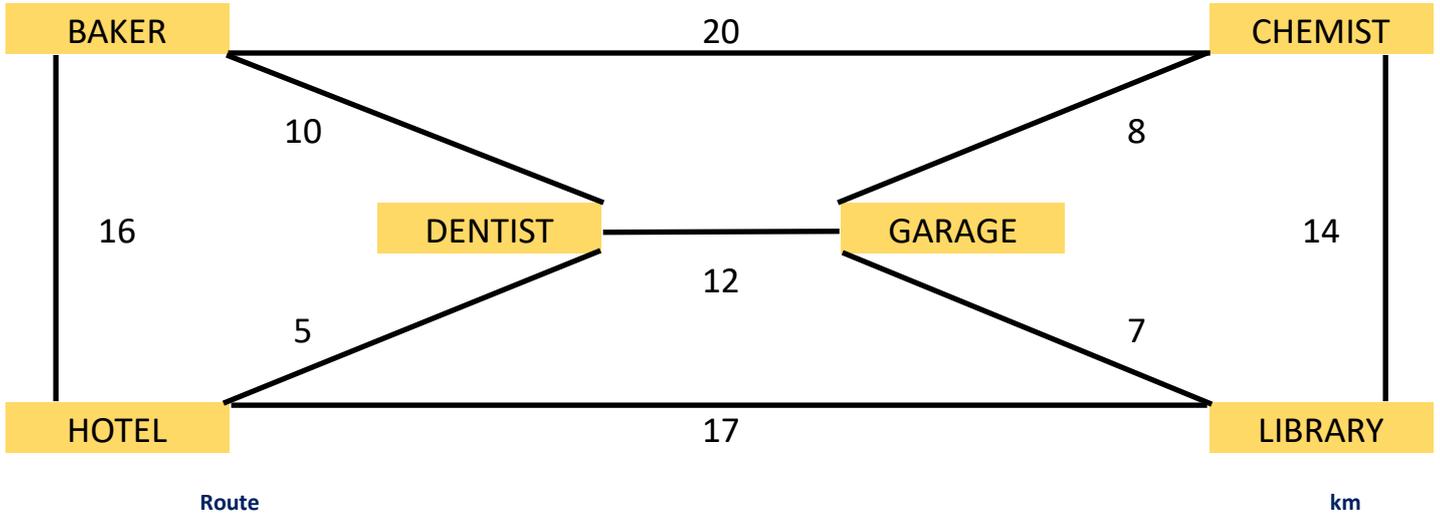
CYCLING CURLY

Curly enjoys cycling routes.

Work out where the cyclist has gone on each route. Each place is only passed once.

```
BAKER ——————————— 20 ——————————— CHEMIST
      10                        8
  16        DENTIST —— GARAGE          14
                 12
       5                          7
HOTEL ——————————— 17 ——————————— LIBRARY
```

Route								km
Trip 1	B to L	**B**			**L**			**29**
Trip 2	H to G	**H**			**G**			**44**
Trip 3	G to D	**G**				**D**		**44**
Trip 4	D to H	**D**					**H**	**62**
Trip 5	L to C	**L**					**C**	**60**

BROKEN CALCULATORS

You have to use all the available keys, and only ONCE, to make the total

168

```
[+] [ ] [ ] [ ]
[ ] [ ] [ ] [ ]
[4] [5] [ ] [ ]
[1] [2] [3] [ ]
    [ ]     [=]
```

148

```
[ ] [ ] [×] [ ]
[7] [ ] [ ] [ ]
[4] [ ] [ ] [ ]
[ ] [ ] [3] [ ]
    [ ]     [=]
```

13

```
[ ] [-] [ ] [÷]
[7] [8] [ ] [ ]
[4] [ ] [ ] [ ]
[1] [ ] [ ] [ ]
    [0]     [=]
```

ADDING PAIRS

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

42		53	
18	24	25	28

39		14		43
5	8	9	17	22	35

40		49		41
5	15	17	26	32	35

63		37		22		17
6	7	10	11	12	30	31	32

36		23		51		46		53
7	14	15	16	21	25	28	30	31	32

14		36		42		41		42		34
5	7	8	9	15	16	17	21	24	26	27	34

PAGE NUMBERS

If you have 12 pages in a booklet you will have 15 digits, that is:
1-2-3-4-5-6-7-8-9-1-0-1-1-1-2 = 15 digits

If you have 21 digits the number of pages will be 15:
1-2-3-4-5-6-7-8-9-1-0-1-1-1-2-1-3-1-4-1-5 = 21 digits / 15 pages

A
How many pages will a booklet have if the page numbers are made up of 25 digits altogether?
B
In my book I counted 20 pages - how many digits will there be?
C
How many pages will a booklet have if the page numbers are made up of 53 digits altogether?
D
In my book I counted 89 pages - how many digits will there be?
E
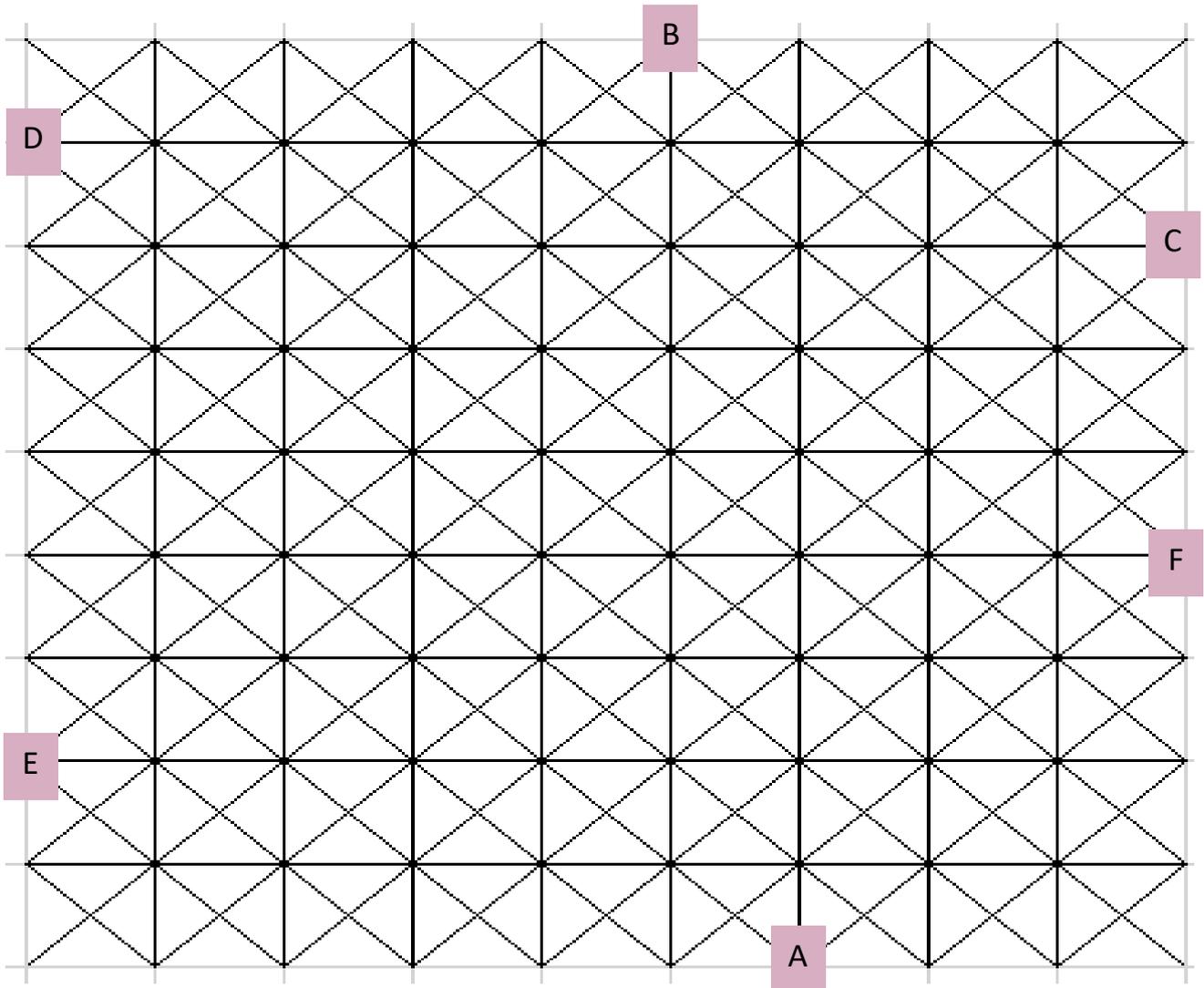How many pages will a book have if the page numbers are made up of 190 digits altogether?

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-East 2 corners; North 1 corner; West 7 corners; South-West 1 corner

START B - South-West 3 corners; South 3 corners; South-East 2 corners; East 2 corners; North 5 corners; North-East 2 corners; South-East 1 corner

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

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

START F - West 1 corner; North 2 corners; South-West 3 corners; North-West 4 corners; North-East 1 corner; East 5 corners; South-East 1 corner; East 1 corner

HORIZONTAL TRACKS

Fill in the correct values in the empty boxes to make the value on the right.

	2 5 6 12 15									
A		+		-		x		÷		=	30

	1 2 10 15 16									
B		+		÷		-		+		=	28

	6 7 9 10 15									
C		x		-		+		-		=	26

	4 8 9 12 13									
D		÷		x		-		+		=	38

	3 4 6 11 16									
E		x		÷		x		-		=	72

FILL IT IN!

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

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	

(Grid contains the values: 6, 1, 1, 3)

HOW OLD AM I?

The ages of a father and son add up to 66.

The father's age is the son's age reversed. How old could they be?

Find the three possible answers. Think "outside the box" to find the third answer.
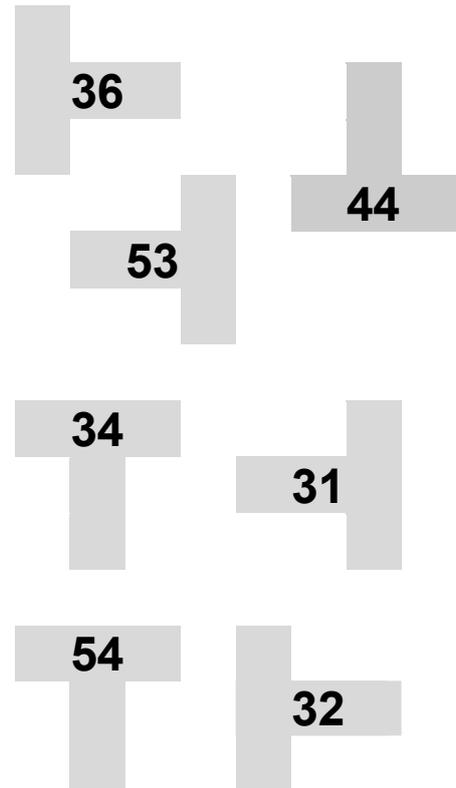
LOST PENTOMINOES

Pentominoes are made up of 5 squares. There are only 12 possible shapes

Colour in the pentominoes which make the totals shown in the blank pentominoes

2	14	4	6	4	3	10	9	12	2
14	6	9	5	15	8	14	15	4	12
8	8	1	8	13	1	9	7	4	10
4	1	5	7	13	13	4	9	1	7
10	4	1	12	2	10	5	4	14	11
13	3	10	5	6	1	4	14	15	10
10	2	1	12	5	7	5	2	8	15
14	7	5	15	11	5	12	13	7	2
3	8	4	9	6	8	15	4	2	4
1	15	11	2	12	15	7	2	12	14

36

44

53

34

31

54

32

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
Card 1 and Card 2 equal Card 3 when added together

B: Cards 1 2 3 4 5
1 is three places away from the 3
Card 2 plus Card 5 equal 9 when added together
Card 3 multiplied by Card 4 equals 2

C: Cards 1 2 3 4 5 6
The 1 is next to the 4 and the 2 is next to the 3
Card 1 and Card 2 equals 9 when added
The 4 is four places away from the 6

D: Cards 1 2 3 4 5 6 7
Card 1 plus Card 7 equals Card 5
The 5 is two places away from the 6 and two places away from the 7
Card 2 plus Card 3 equals 8

E: Cards 1 2 3 4 5 6 7 8
Card 1 multiplied by Card 5 equals 5
Card 3 multiplied by Card 8 equals 18
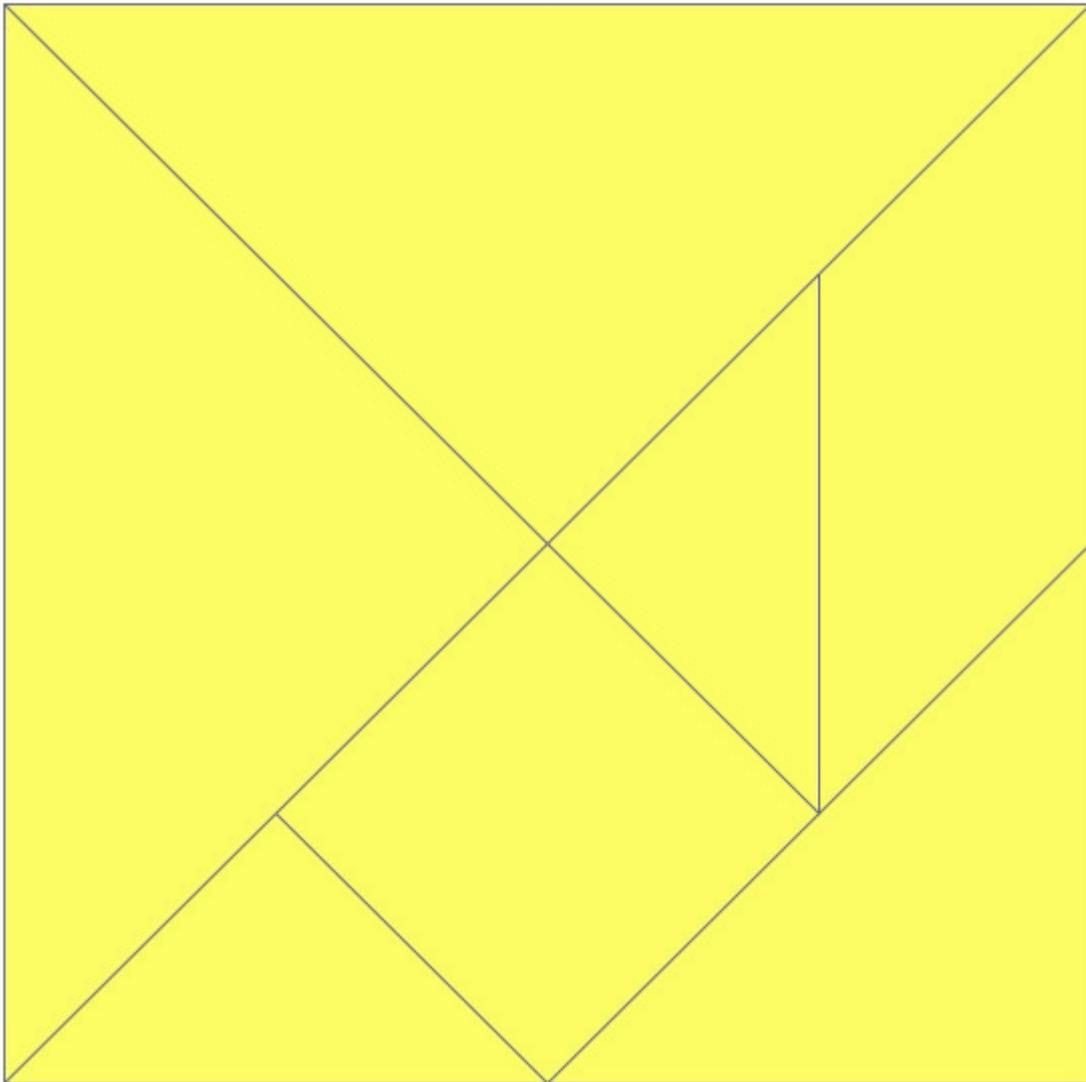The 4 is to the left of 2 but right of 1
Card 2 added to Card 7 equals 9

TANGRAMS

Print the page on card and cut out the 7 shapes.

Ideally purchase a set. Ebay (UK) is selling a wooden set for £2 including postage (click here)

Make squares or rectangles using 2 pieces, 3 pieces, 4 pieces, 5 pieces, 6 pieces and 7 pieces.

Make triangles using pieces, 3 pieces, 4 pieces, 5 pieces and 7 pieces. 6 pieces is impossible

In the Tangram Channel website there are 252 puzzles involving tangrams.

SOLUTIONS

COUNTING DOWN: there are many combinations. Ask somebody to check them or use a calculator. **SHAPE WORDS**: area centimetres cones conical edges faces kilograms kilometres metres milligrams millimetres perimeter prism pyramids spheres tetrahedrons tonnes volume **CYCLING CURLY:** BDGL HBCG GCLHD DBCGLH LGDHBC **BROKEN CALCULATORS:** 125 + 45; 37 x 4; 78 ÷ (10—4) **ADDING PAIRS**: 18 24 25 28; 5 8 9 17 22 35; 5 15 17 26 32 35; 6 7 10 11 12 30 31 32; 7 14 15 16 21 25 28 30 31 32; 5 7 8 9 15 16 17 21 24 26 27 34 **PAGE NUMBERS**: A: 17 pages B: 31 digits C: 31 pages D: 169 digits E: 100 pages **SILLY SPIDER**: A to E; B to C; E to A; D to F; F to C **HORIZONTAL TRACKS:** A: (15+12-2)x6÷5 B: (10+16)÷2-1+15 C: (6x7)   -15+9-10 D: 12÷4x13-9+8 E: (6x11)÷3x4-16 Values in brackets can be interchanged **HOW OLD**: 51-15; 42-24; 60-06 LOST **PENTOMINOES:** (the top square is at) 36: row 7 col 5 44: row 4 col 7 53: row 10 col 8 34: row 10 col 3 31: row 3 col 3 54: row 5 col 8 32: row 7 col 1 **ORDERING CARDS:** A: 3142 B: 35214 C: 562914 D: 4625371 E: 57681423