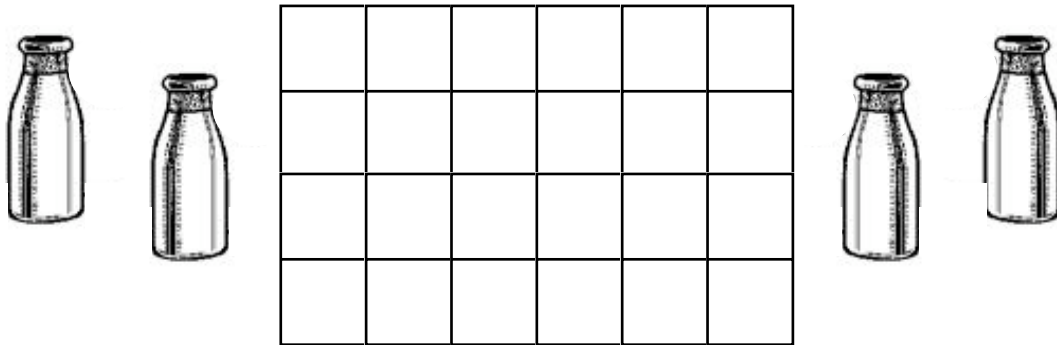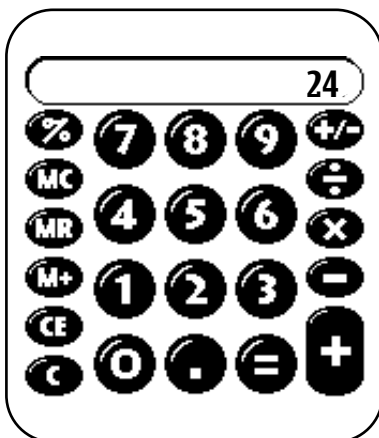# Milk Muddle

A milk crate holds 24 bottles and is shaped like this.

The crate has four rows and 6 columns. Can you put 18 bottles
of milk in the crate so that each row and each column of
the crate has an even number of bottles in it ?
Is there only one way to do it ?

Calculator Conundrum

You may use a calculator for this puzzle.

Using 2 , 4 , 6 , 8 ,

and $\times$, $\div$, and $+$

for every answer, solve these problems.

What is the largest answer you can make ?

What is the smallest answer you can make ?

Can you make exactly 100 ?

Four Four Four

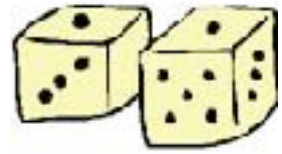Can you make all the numbers from 1 to 20 using only the number 4 ?

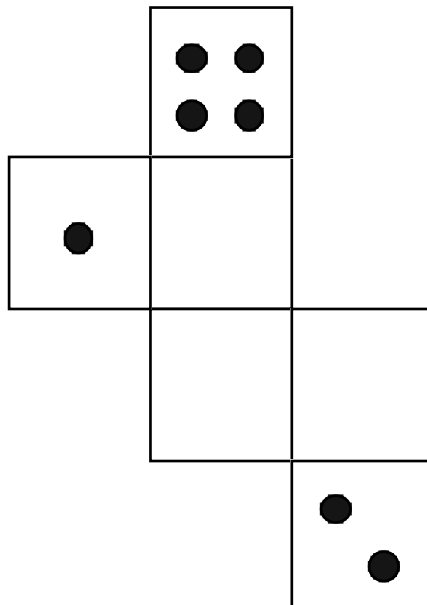You can make 8 by 4 + 4.
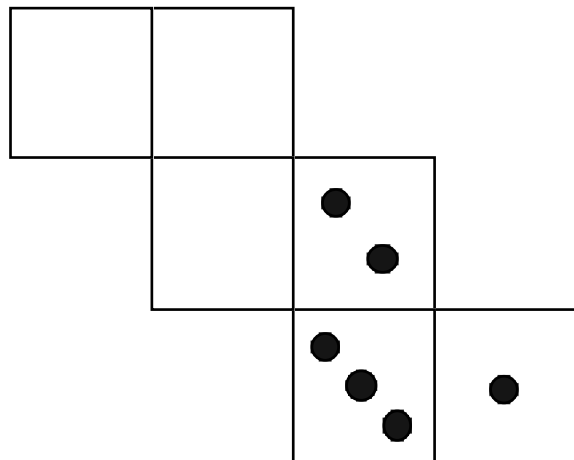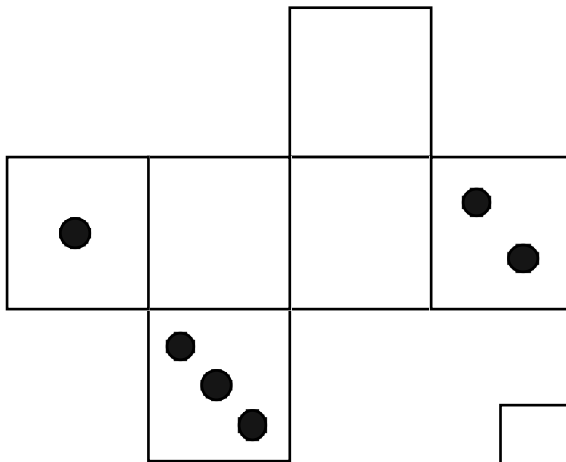How can you make 1 ?
Now make all the others.

Make Your Own Dice

A dice has six sides marked
with dots representing
1 , 2 , 3 , 4 , 5 and 6.

Opposite sides of the dice add up to 7.

Copy the nets of dice below and fill in the missing dots.

Two Halves Make a Whole

Trace the shaded shape. Show how to cut it into two pieces which can be rearranged to make any of the shapes A , B , C , D , E and F.

GIVE IT TO ME STRAIGHT DOC — HOW LONG HAVE I GOT? OFF SCHOOL I MEAN?

A

B

C

D

E

F
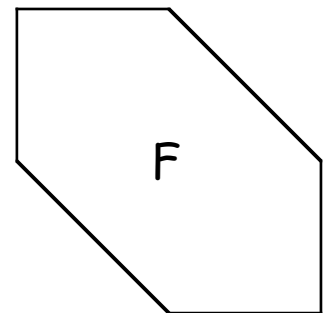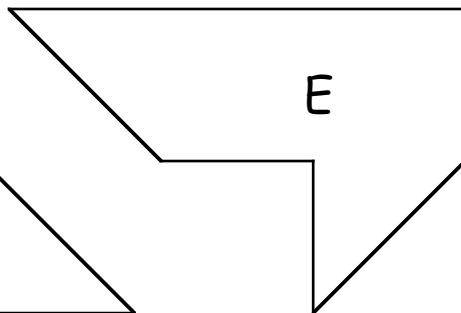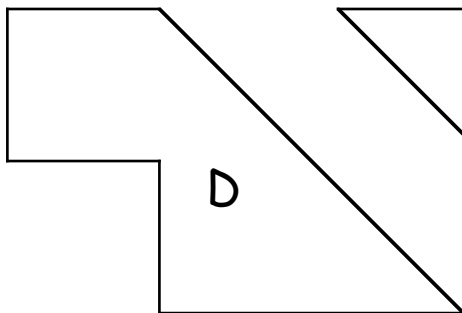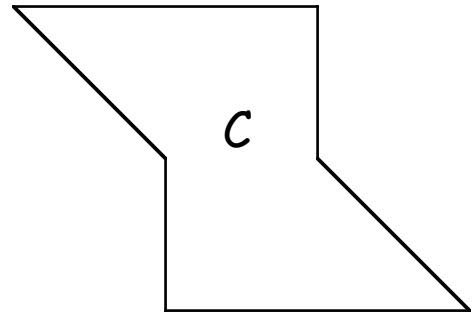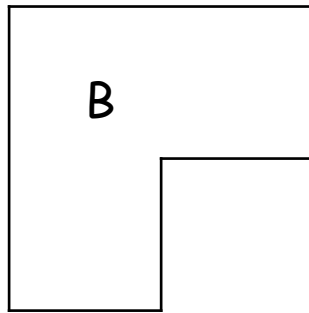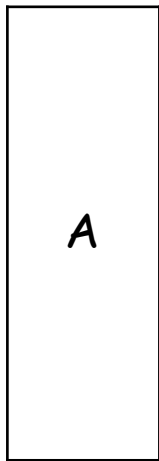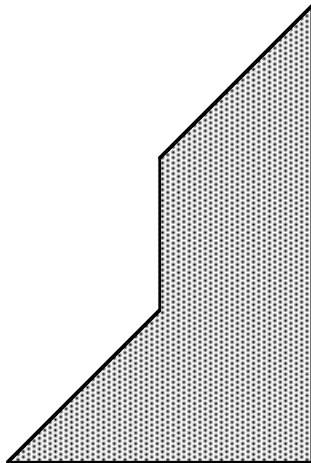
Magic Stars

Copy the diagrams below into your jotter.
Fill in the missing numbers so that each
straight line has the same total.
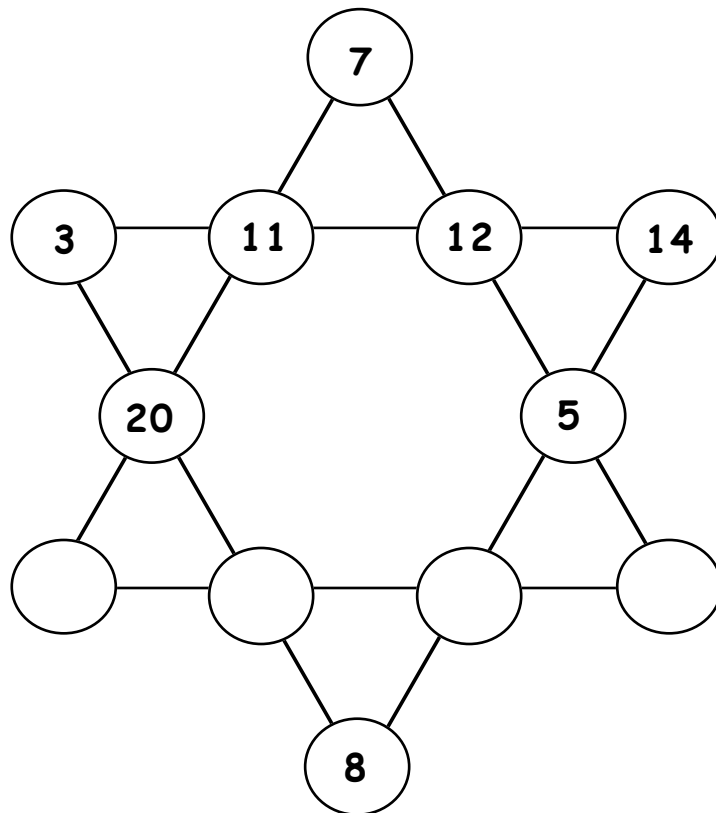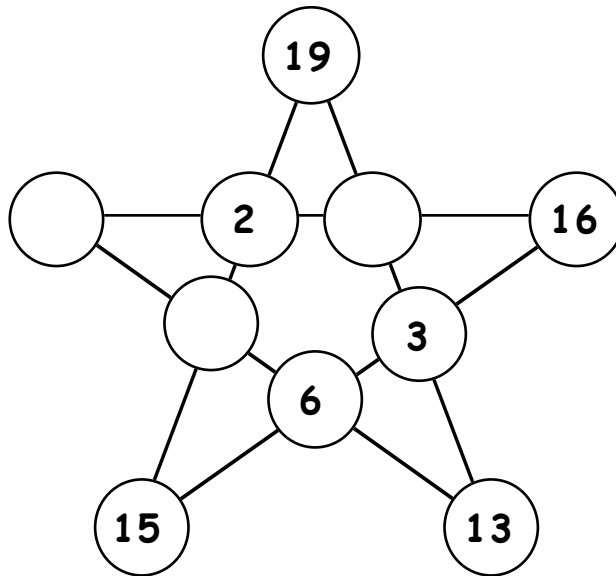
If you wish to try some harder magic star examples look at page 68.

Book Brain Bender

A secret message is written in invisible ink on the page of a book.

The page number

❑   is between 400 and 800.
❑   has its tens digit one more than the hundreds digit.
❑   has its units digit one more than the tens digit.
❑   is exactly divisible by 9.

On which page of the book is the secret message written ?

Hurdle Headache

This diagram shows how a farmer used 13 hurdles to make 6 identical sheep pens. Unfortunately one of the hurdles was damaged.

Draw a diagram showing how the farmer could use the 12 undamaged hurdles to make 6 identical pens.
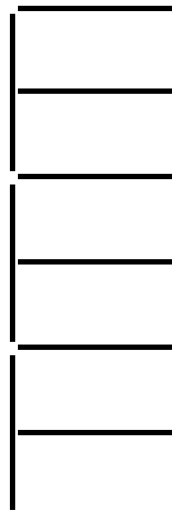
Milk Mayhem

A farmer wants exactly one pint of milk to test for impurities. She has only a five pint jug and a three pint jug to measure out the milk from the churn. How can she measure one pint without wasting any milk ?

Shopping Spree

Arthur bought some jumpers costing £16 and some T-shirts costing £10. He spent £98.

How many jumpers did he buy ?

Mind Boggler

I think of a number.
I treble it.
I subtract five from my answer.
After all this my answer is 10.

What number did I think of ?

Sweet Madness

Lyn has some sweets.
Alex has four times as many as Lyn.
Lesley has eight more than Alex.
Lesley has 32 sweets.
How many sweets do they
have between them ?

Mind Muddler

I think of a number.
I add eight to it.
I divide my answer by five.
The answer is 3.

What number did I think of ?
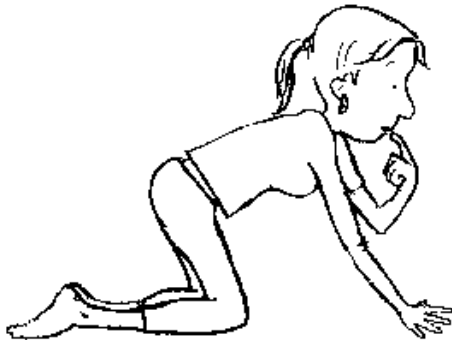
Magic Squares 2

A magic square is a square of numbers in which every row, column and diagonal add up to the same total, such as the example shown opposite, where every line adds up to 34, its magic number.

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

In your jotter, copy the magic squares below and fill in the missing numbers. (Hint: find their magic numbers first.)

2	3		14
			1
8		7	12
	10	6	7

			17
	19		5
11	4		18
15		9	6

Now try these, where the reasoning is not so straightforward.

1			8
	6	3	
7	9		2
	4	5	

	3		15
	17		5
7	6		8
13		9	

If you want some harder examples try Magic Muddle on page 67 or Magic Cubes on pages 69 & 70.

Cool Cube

Find the number that is both
the surface area in
square centimeters and
the volume in cubic centimeters
of the same cube.
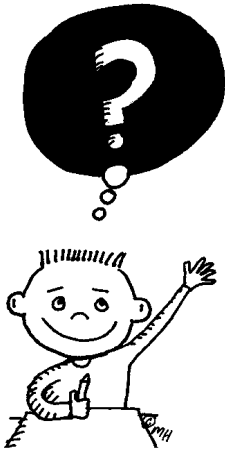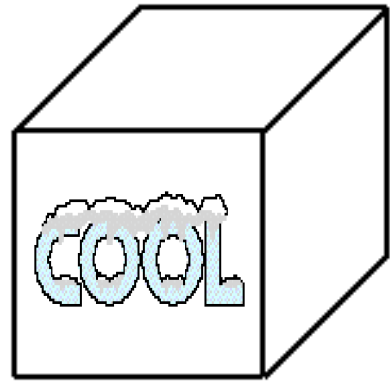
Mystery Number

It has three digits.
It reads the same when
turned upsides down.
It is a multiple of fifty three.
Which number is it ?

Birthday Treat

How many different ways
can Susan choose
four of her
ten friends to join her
for her birthday treat ?

Odd Ollie

Ollie likes odd numbers.
How many three digit
numbers are there that
contain only odd digits ?

Button Brain Bender

Erik had some buttons.
When he counted them out in
groups of 2 , 3 , 4 , 5 or 6 he
alway had one left over.
If he had less than 100 buttons,
how many did he have ?

Hungry Cat

A hungry cat ate 100 rats in
5 days. Each day it ate 6 more
than on the day before.
How many rats did the cat
eat on the first day ?

Melon Madness

An old woman has a watermelon.
The watermelon weighs four
fifths of its weight
plus four fifths of a pound.

How many pounds does it weigh ?

Money Muddle

What is the largest amount
of money you can have in
coins and still
not be able to make £1 exactly.
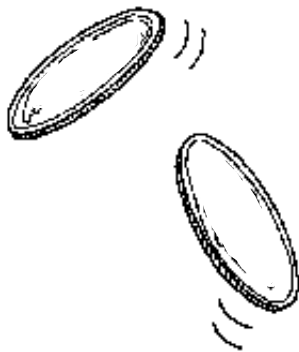
Only Four Lines

In your jotter copy the pattern of nine dots in a square. Without taking your pencil from the paper, draw four straight lines that together pass though all nine dots.

. . .
. . .
. . .
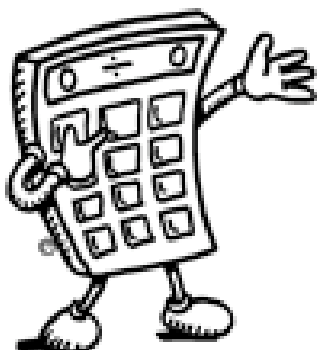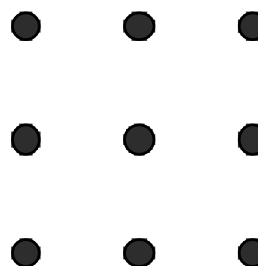
Calculator Challenge

56406

is the product of two consecutive whole numbers.

What are the two whole numbers ?

Fit Men Jog

Each letter stands for
one of the digits
1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 and 9.
Each digit is used only once.
Copy and complete:-

F =   M =   J =

I =   E =   O =

T =   N =   G =

```
  F I T
+ M E N
-------
  J O G
```

Doin' ur heed in !

The addition sums shown are in code.
The same code is used for both sums. Each letter represents a single digit.

```
    E E L              A L E
  + G E L            + L A G
    A G E              B B A
```

Copy and complete

L =
E =
G =
A =
B =

Safety First

The addition sum shown is in code. Each letter represents a single digit.
S for example represents 3. What do the other letters represent ?

```
    C R O S S
  + R O A D S
  D A N G E R
```

DANGER

Skint

The addition sum shown is in code.
Each letter represents a single digit.
What do the letters represent ?

```
    S E N D
  + M O R E
  M O N E Y
```

Demonstrating Dilema

From the information shown below,
find out who is demonstrating to save what.

Ziggy wears a hat.

Caz is shorter than Zee.

Taz is not a woman.

Caz doesn't like young people.

Gazza wants to save money.

Plant Problem

A new plant grows one leaf on day one, two leaves on day two, three leaves on day three and so on. Assuming no leaves fall off, how many leaves will be on the plant after seventeen days ?

Christmas Cards

In a class of twenty students twelve have mobile phones.
Those without phones send cards to everyone in the class.
The others send cards to everyone without a mobile phone.
How many cards were sent ?

Tick Tack Tuck

3 ticks = 2 tacks
5 tacks = 4 tocks
7 tocks = 6 tucks

How many ticks make 240 tucks ?
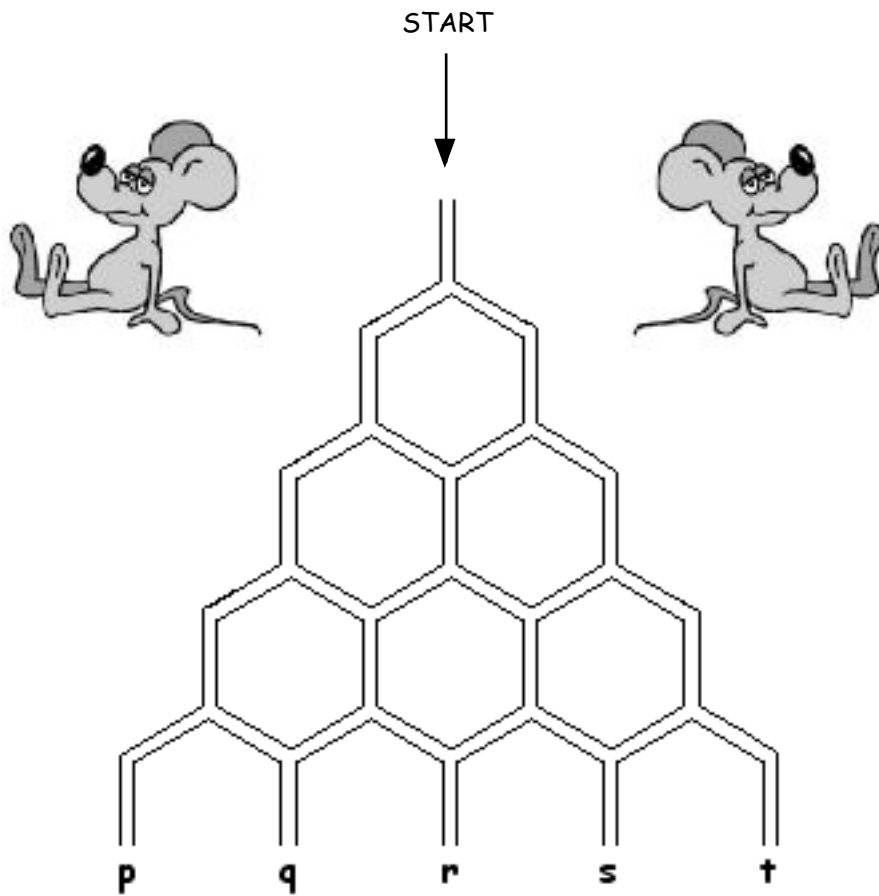
Consecutive Sum

The sum of five consecutive even numbers is 230.

What is the smallest number ?

Rat Maze

Sixteen rats enter a hexagon maze as
shown and at each fork half go one way
and half go the other way.
How many rats leave the maze at p , q , r , s and t ?

START

p   q   r   s   t

Try this with 32 rats entering a maze which extends one more stage.

Butterfly Brain Buster

Ben grows flowers. One day he went out into the garden and found to his amazement there were lots of butterflies on his rose bushes.

Two thirds of the butterflies were red.

Ben has four rose bushes in a row.

Each rose bush had twice as many butterflies as the bush before.

There were a total of ninety butterflies on his rose bushes.

1   How many red butterflies were there ?

2   How many butterflies were there on the third rose bush ?

3   How many butterflies on the fourth rose were not red ?

Magic Muddle

This was originally a magic square: (each of the rows and columns and the two diagonals added up to the same total.) However, it has been spoilt by swapping three pairs of numbers.

Discover which pairs of numbers have been exchanged and restore the original square.

7	2	3	13
5	12	14	8
9	16	6	11
4	10	5	1

Switcherooney

e   e   e   e   e   e   e   e

8 4 2 5 1 7 3 6
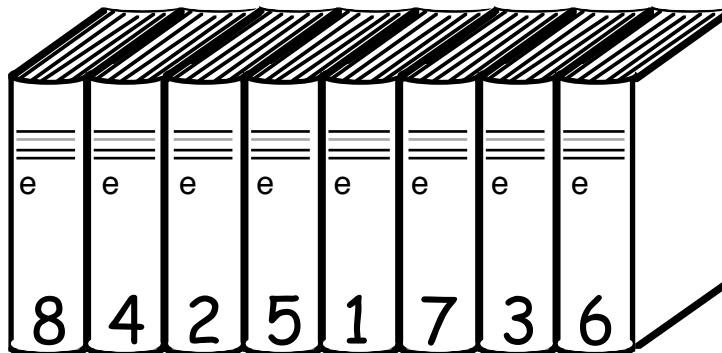
There are eight volumes of Anne's encyclopaedia on her bookshelf.
They need arranging in order.
If taking a book from the shelf, pushing some books to one side and putting the book back counts as one move, what is the smallest number of moves needed to arrange the set correctly ?

What am I ?

I am a proper fraction in its simplest form.
The product of my numerator and denominator is a multiple of seven.
Their sum is a perfect square.
What am I ?

Magic Stars 2

Copy the diagrams below into your jotter.
Fill in the missing numbers so that each
straight line has the same total.
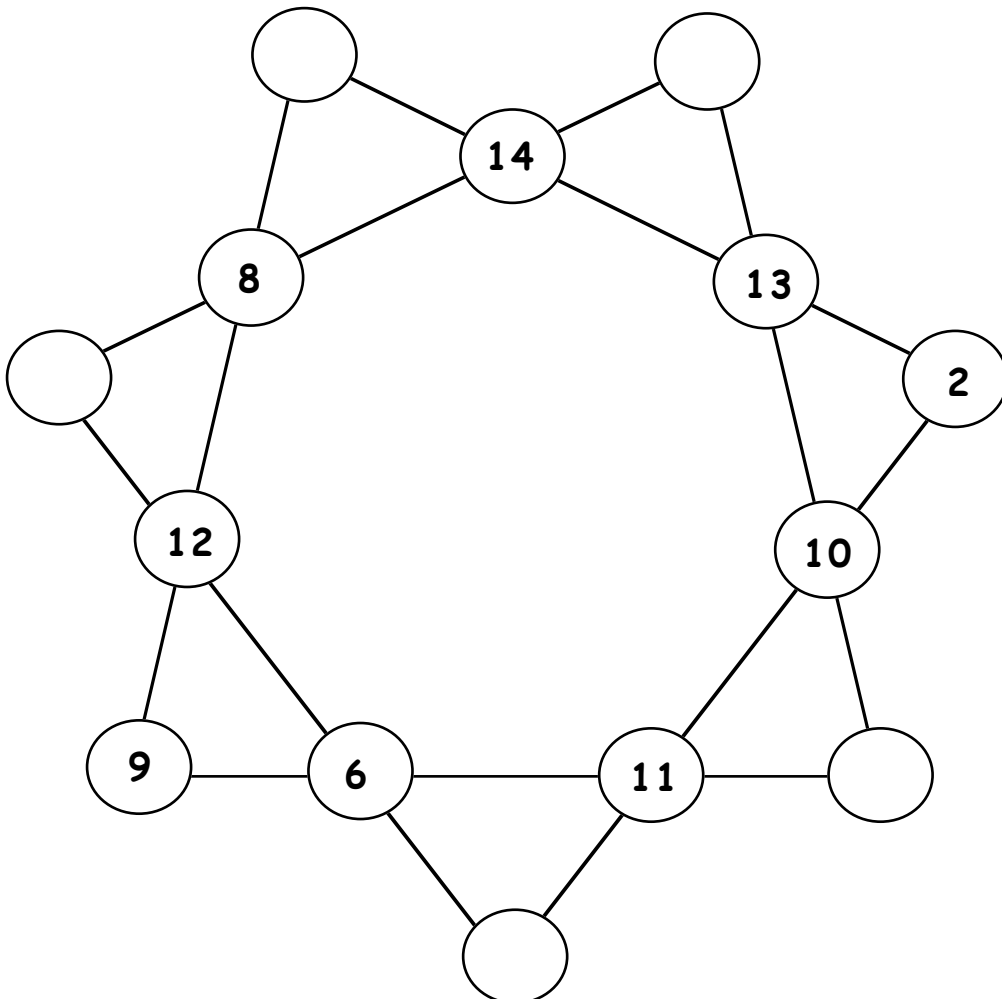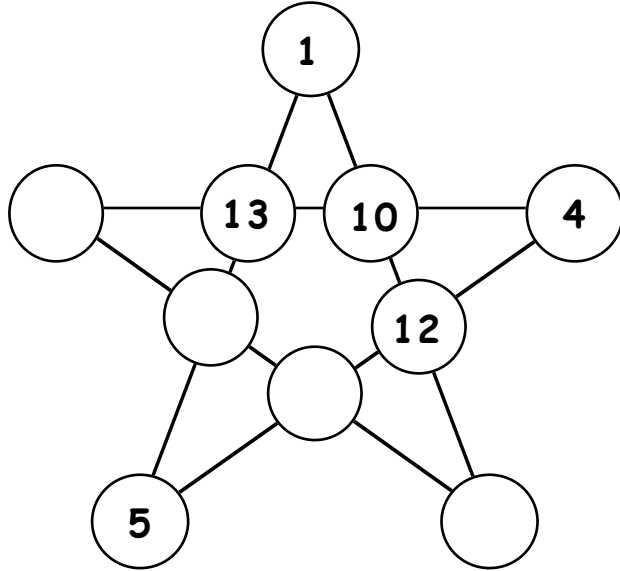
Magic Cubes

A magic cube has each of its six faces
displaying a different magic square
and with all contiguous
bordering squares having
the same value as
the squares they
touch.

See example
below.
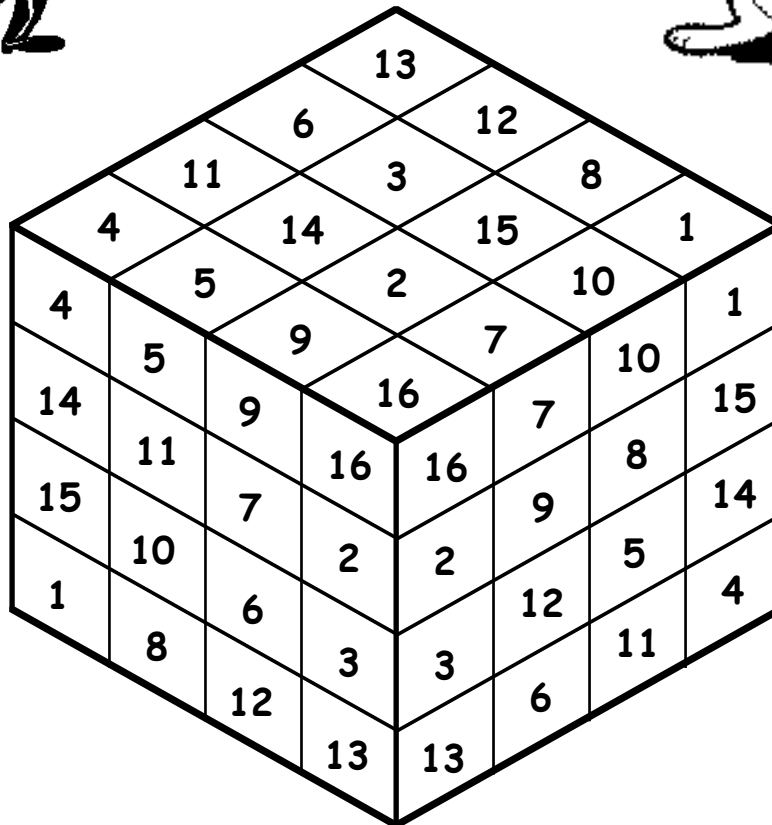
Now try and complete the two-dimensional
form of the magic cube on the next page.

Magic Cubes

On squared paper, complete the nets of the magic cubes below.

Magic number **34**.

First net (cross shape), values shown:

15, 9, 14, 11, 4, 16, 9, 4, 6, 13, 3, 16, 12, 10, 2, 6, 14, 11, 12, 3, 1

Second net (cross shape), values shown:

5, 12, 5, 4, 2, 3, 14, 7, 9, 15, 6, 5, 16, 7, 13, 4, 2, 10, 6, 3, 12, 4, 7, 14

Magic number **34**.

Who's Who ?
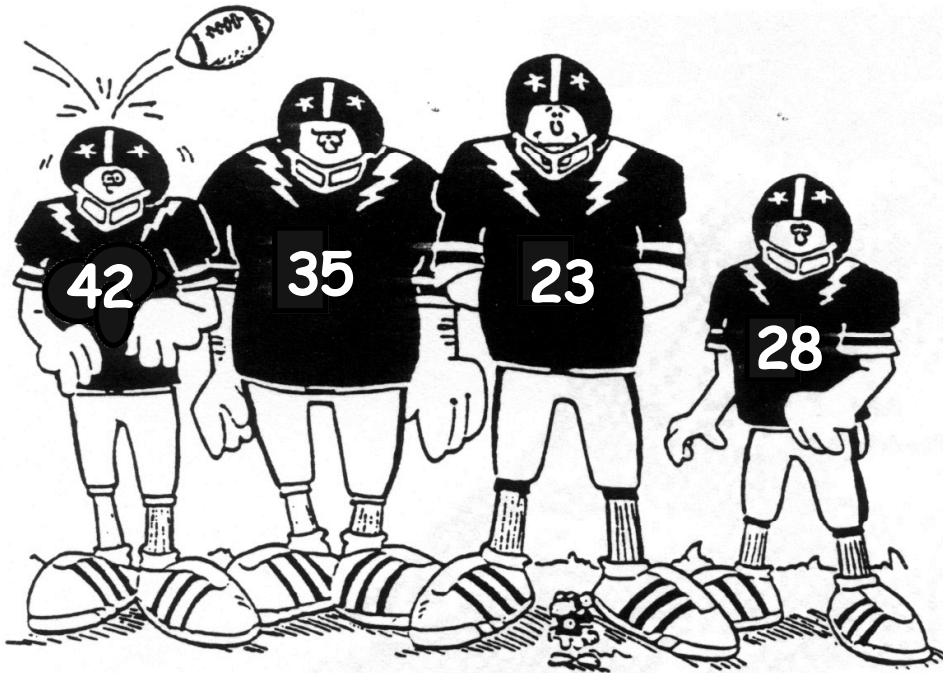
Identify the players.

Zack does not wear a prime number.

Nigel has a higher number than Ian.

Perry wears an odd number.

Ian's number is divisible by 7.

Zack is not standing next to Perry.

Nigel turns to his left to see Perry.

Sudoku 1

To solve this puzzle each 3 x 3 box,
each row and each column must contain
all of the digits 1 to 9.
Copy and complete the Sudoku square below.

6	5	2	8	3	7	4		9
	9	3				7	5	8
8	7	4	1		9	3		6
	8	9			6	2		
2	1	7		4				3
3	4	6		7	2	5		
						1	4	5
4			2	9	1		3	
7	3					6	9	2

Sudoku 2

To solve this puzzle each 3 x 3 box,
each row and each column must contain
all of the digits 1 to 9.
Copy and complete the Sudoku square below.

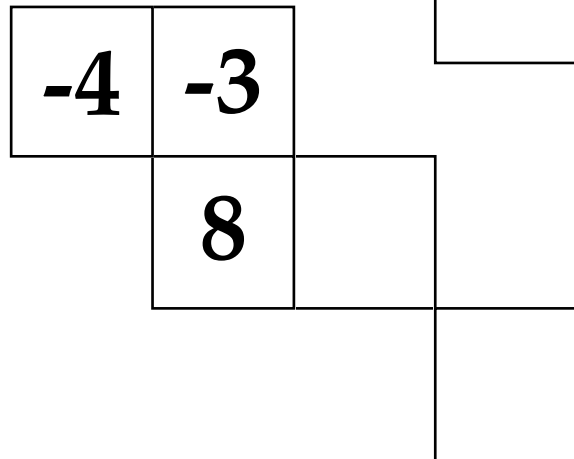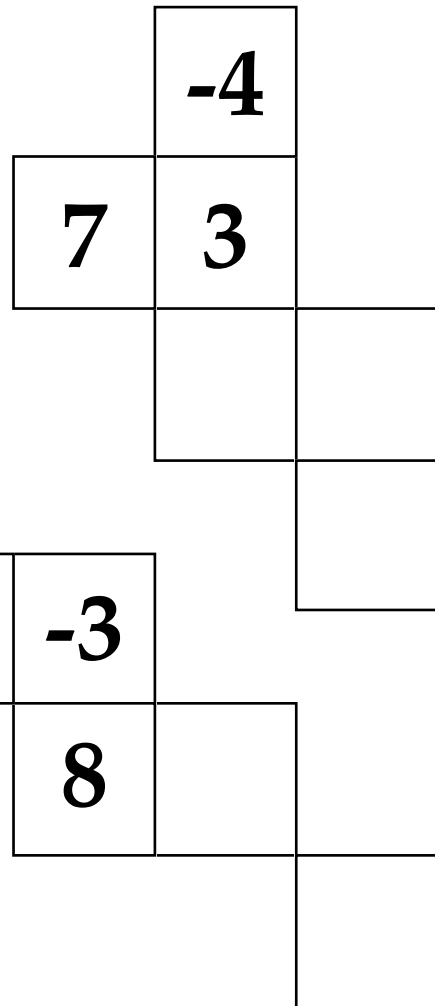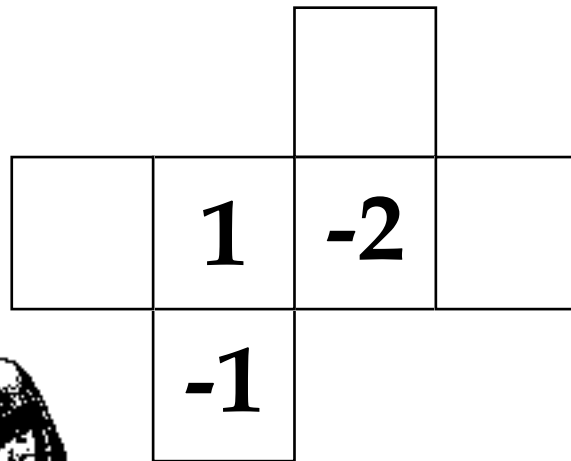| 5	6	2		1	3	8		9
	8	7				4	3	5
	5	3			1	7		
7	2	1		5	4			6
6	4	8		3	9	5		
						1	5	4
2			1	4	8		6	
4	1					2	8	7

"DO YOU RECKON THAT'S REALLY THE END ?"

Make Your Own Dice 2

Certain dice have six sides
marked with numbers.

Opposite sides of the dice add up to 7.

Copy the nets of dice below and fill in the missing numbers.

| 1 | -2 | |

| -1 |

| -4 |
| 7 | 3 |

| -4 | -3 |
| | 8 |

Magic Squares 1

A magic square is a square of numbers in which every row, column and diagonal add up to the same total, such as the example shown opposite, where every line adds up to 24, its magic number.

11	3	10
7	8	9
6	13	5

In your jotter, copy the magic squares below and fill in the missing numbers. (Hint: find their magic numbers first.)

6		
7	5	3

		10
	7	
4		5

Now try these, where more numbers are given to you but the reasoning is not so straightforward.

14	3	
		13
8	15	

11	1	
9		7
	15	5

If you want to try some harder magic squares look at page 58.