CALCULATING VAT

Value **A**dded **T**ax adds 17.5% on to the price you pay when you buy something.

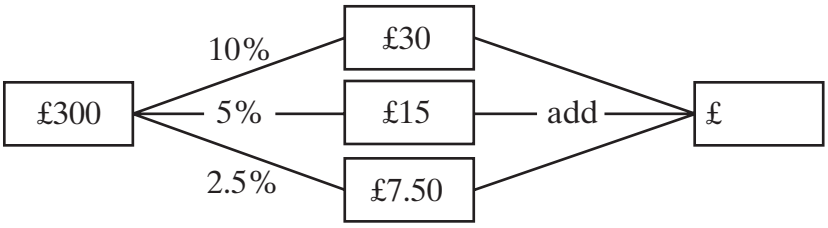
If you see: MP3 PLAYER £300 + VAT you have to add on 17.5%

Think of 17.5% as 10% + 5% + 2.5%

This is how you work it out:

	10% of £300 is	£30	
Halve it:	5% is	£15	Half of 10% is 5% and half of £30 is £15
Halve it again:	2.5% is	£7.50	Half of 5% is 2.5% and half of £15 is £7.50
Add up:	17.5% is	£52.50	
Add on:	£300 + £52.50 = £352.50		The total cost is £352.50

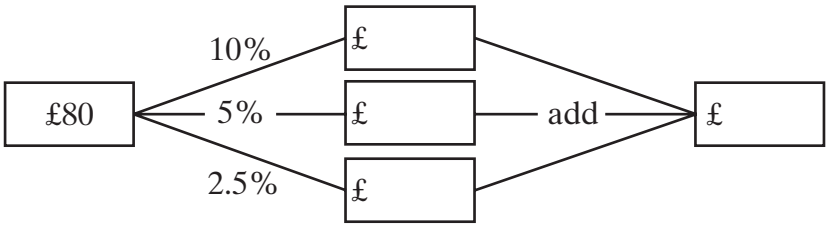
Looks a bit complicated, but try it this way!
You fill in the gaps!



Now add this to what you started with: £300 + £ ☐ = £ ☐ This is what you pay.

Now try these for yourself.

1



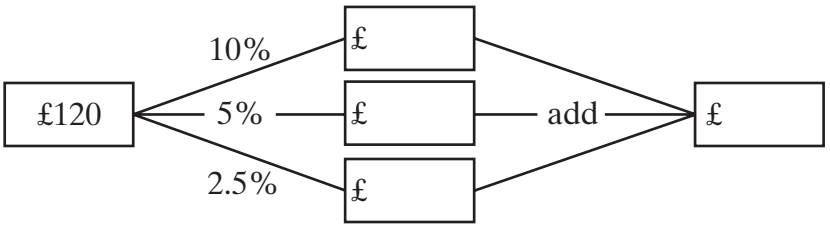
Music CD Set £80 + VAT

add up 17.5% is £ ☐

add on £80 + £ ☐ = £ ☐ This is what you pay.

(continued)

2

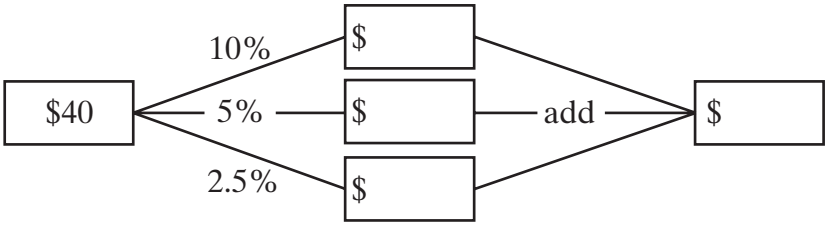


Hotel Splendid
£120 + VAT

add up 17.5% is £ ☐

add on £120 + £ ☐ = £ ☐ This is what you pay.

3

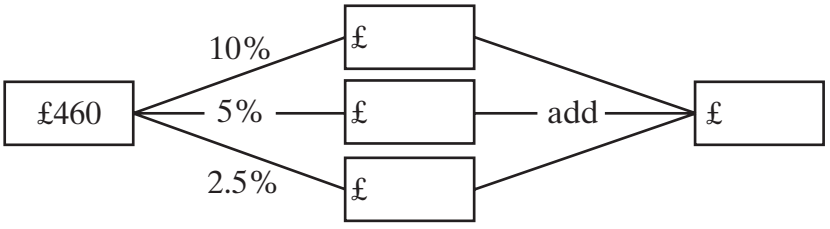


American Diner
$40 + VAT

add up 17.5% is $ ☐

add on $40 + $ ☐ = $ ☐ This is what you pay.

4

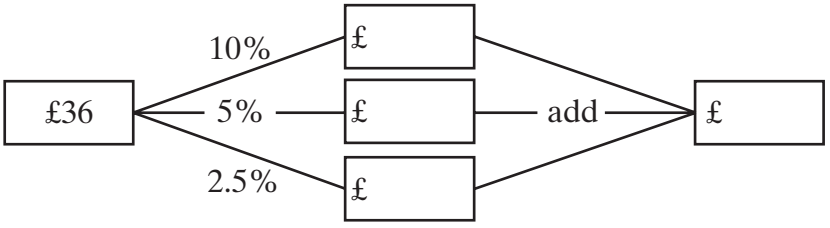


Holiday Treat
£460 + VAT

add up 17.5% is £ ☐

add on £460 + £ ☐ = £ ☐ This is what you pay.

5



Restaurant Meal
£36 + VAT

add up 17.5% is £ ☐

add on £36 + £ ☐ = £ ☐ This is what you pay.

(continued)

Now you have the idea, see if you can set these out yourself.

6

£50

10%

5%

2.5%

Rike
Trainers
£50 + VAT

7

£90

10%

5%

2.5%

Driving Lessons
Three for
£90 + VAT

8

£70

Course of
Ballet Lessons
£70 + VAT

9 I save up £50 from my part-time job.
I want to by a new skateboard which costs £32 + VAT.

a) Do I have enough money to buy it? .....

b) If not, how much do I need to borrow off my Dad?
Hint: Work out the VAT on £32 and add it on to find the total cost. .....

10 A car repair job costs £560 + VAT.
OK, so it was my fault but my mum has forgiven me if I pay for the repairs.
How much is this going to cost me? .....

INVESTIGATING BANKS AND BUILDING SOCIETIES

Use a calculator to do this investigation.

1 Banks and Building Societies pay different Rates of Interest on Savings.

CLYDE SAVINGS 4.8%	METRO BANK 4.4%	REGENCY B.S. 5.2%
MAKEDO BANK 4.9%	HELPFUL B.S. 4.6%	BHA SAVINGS 4.7%

Complete the table to put these in rate order, starting with the highest.

Order	Bank or Building Society	Rate
1st		
2nd		
3rd		
4th		
5th		
6th		

2 Tristan has £1200 and he puts £200 in each of the Banks and Building Societies for one year.
Use a calculator to work out the interest he receives from each one at the end of the year.
Calculator work:

CLYDE SAVINGS 4.8% of £200

Fraction $\frac{4.8}{100} \times$ £200 = £9.60

a) Do the same for the other five.
Make a table like the one above and put these in order starting with the one which pays the most in interest.
b) Is this the same order as your previous table?

3 What is the total interest he receives adding together the interest from all the Banks and Building Societies?

4 Tristan decides to compare the Banks and Building Societies.
He puts all his money, £1200, in the one paying the greatest rate of interest for one year.
a) Work out how much interest he receives at the end of the year.
The next year he puts his money, £1200, in the one paying the lowest rate of interest.
b) Work out how much he receives at the end of the year.
c) What is the difference between the two amounts?

5 Look in newspapers for advertisements showing rates of interest for Banks and Building Societies.
Try to cut out or make a note of the name and the rate of interest given.
Make a table to compare your findings.
You could use this information to produce a graph of your results.

MONEY PROBLEMS

Try this WORDSEARCH.
All of these words are to do with money.

SAVINGS
INTEREST
MONEY
RATE
YEARS
BANK
MANAGER
BUILDING
SOCIETY
CASH
PER CENT
COST
AMOUNT
POUNDS
EURO

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

Which word is not in the WORDSEARCH?

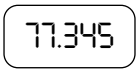
.....

CALCULATOR WORK

Use your calculator to work out the clues to the words so that you can read the story.

When you have done each calculation, turn your calculator upside down so that you can read the word.

Ignore the decimal points.

For example:  when upside down spells **SHELL**

The story

One day, 1 ..... **and** 2 ..... **went to the** 3 ..... **.**

‘ 4 ..... **!’ said** 5 ..... **, ‘**6 ..... 7 ..... **a** 8 ..... 9 ..... **.’**

‘You’ve had too much 10 ..... **and are** 11 ..... **,’ said** 12 ..... **.**

‘That 13 ..... **a** 14 ..... **with a** 15 ..... **that has laid a** 16 ..... 17 ..... **.’**

‘18 ..... **!’ said** 19 ..... **, as** 20 ..... **arrived on his** 21 ..... **.**

‘I’ve had 22 ..... 23 ..... **for breakfast, but forgot to break the** 24 .....

before 25 ..... **ate it’, .** 26 ..... 27 ..... **.**

Clues

1 $\sqrt{225} \times 1 \div 100$

2 $5^3 \times 61 + 10^2 - 7$

3 2×0.1^2

4 $5 + 7 \times 5$

5 $3.45 \div 23$

6 $5^2 - 3 \times 2^3$

7 $\sqrt{112\,225}$

8 $8.5^3 + 3 + 7 \div 8$

9 $6 \times 10^7 + 2 \times 218\,017$

10 $10 \times 2^3 \times 20^2 + 8$

11 $15 \times 23\,005 \div 10^6$

12 $59 + 111 \times \sqrt{4761}$

13 $(2 \times 10^2 + 4) \div 4$

14 30^2

15 $154^2 + 106^2 + 2 \times 3^3$

16 $\sqrt[3]{0.008} + 253 \div 500$

17 $10^3 - (4 + 3)$

18 2×0.2^2

19 $68^3 + 55^2 + 80$

20 $7^2 - 3 \times 5$

21 $3 \div 8$

22 $5 \div 16 + 2929 \div 50\,000$

23 $92^2 - 49^2 - 14 \times 5$

24 $279^2 - 496$

25 $1^2 \div \sqrt{1}$

26 $2^5 + 20 \div 10$

27 $0.9^3 - 0.068\,19 \times 5$

CODED ALGEBRA MESSAGES

The letters of the alphabet are shown in the table below.

Each letter is represented by a number.
Number 1 is A, number 2 is B, and so on:

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

Look at this word:

half of 26	19 − 18	2 × 10	5 + 3	double nine and a half
13	**1**	**20**	**8**	**19**
M	**A**	**T**	**H**	**S**

So the code translates the calculation results to the word **MATHS**.

Try these. Some are words and some are a bit more.

1 18 − 12 | double 9 | 3 × 3 | 12 divided by 3 | 4 − 2 − 1 | 5 × 5

2 square root of 4 | 11 − 10 | number half-way between 1 and 5 | half of 30 | 9 + 5 | 6 × 3 | 23 − 8 | 3 + 4 + 5 | half of the number for X

3 5 × 4 | 2 × 2 × 2 | square root of 25 | 16 + 8 | 30 divided by 5 | 1001 − 1000 | 9 + 10 − 16 | half of 40 | 8 + 7 | half of 9 × 4

4 (4 × 3) + 1 | 1 × 1 × 1 × 1 | 5 × 5 | 100 divided by 5 | 23 − 15 | 35 divided by 7 | square root of 36 | six add nine | 6 × 3 | 21 − 18 | 25 divided by 5 | four halves | 2.5 × 2 | 16 + 7 | 13 − 4 | quarter of 80 | four less than a dozen | 2.5 × 10 | 34 − 19 | (7 × 4) − 7

5 Now try to make up a coded message for yourself.
Think of you favourite team. It could be football, hockey, etc.
Pass it on to someone nearby to see if they can translate it.

Good luck!

HARDER CODED ALGEBRAIC MESSAGES

In this puzzle, you still use the letters of the alphabet in the table below, but this time the coding is a bit harder to interpret into a message.

A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
1	2	3	4	5	6	7	8	9	10	11	12	13
N	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
14	15	16	17	18	19	20	21	22	23	24	25	26

This time, you change the letters into numbers first, and then turn the answer back into a letter.
It works like this: For **HE, H** is 8 and **E** is 5, so $8 - 5 = 3$, and 3 is letter **C**.

For example:

This	**codes for**	**which equals**	**which stands for**
$V - I$	$22 - 9$	13	**M**
$(2 \times H) - O$	$2 \times 8 - 15 = 16 - 15$	1	**A**
$3 + D$	$3 + 4$	7	**G**
$3 \times C$	3×3	9	**I**
$(2 \times L) - (3 \times G)$	$(2 \times 12) - (3 \times 7) = 24 - 21$	3	**C**

The word was given as: $V - I \mid (2 \times H) - O \mid 3 + D \mid 3 \times C \mid (2 \times L) - (3 \times G)$
which worked out to be: **M A G I C**
It's really quite straightforward once you try it!

1 Have a go at this one for yourself.
Hint: You might spot the connection with MAGIC.

$X - D \mid 2 \times I \mid D + E \mid M - J \mid$ half of V

Now you are an expert, try these.

2 double J | $T - S$ | quarter of H | $2 \times F$ | $T - (5 \times C)$

3 $M - C$ | $(2 \times H) - O$ | half of Z | square root of Y | $(3 \times E) + (2 \times B)$ | $L - J$ | $C \times E$ | $2 \times G$ | $B + C - A$

4 $D + I$ | $X - W$ | $(2 \times B) + G$ | $(3 \times J) - Y$ | $F + E + B$ | $(H \times C) + A$ | B squared | L divided by L | $E \times E$

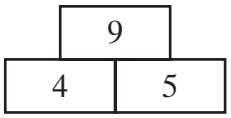
5 $P - M$ | $C + D - F$ | $(3 \times D) + B$ | $(D \times D) + I$ | $3 + L$ | $G \times C$ | $W - 4$ | $(2 \times J) - E$ | half of X | $B \times K$ | $A + D$ | $U - A$ | $B \times B \times B$ | $D + E$ | $P + 3$ | $X - U$ | $A + B + C + D + E$ | P divided by D | $V - Q$

Now see if you can make a code in the same way.
Don't make it too difficult to work out.
Think of the name of a country or a place and see if you can code it.
Make sure that it works before you let someone else try cracking it.
There are many ways you can make up codes.
One way would be to jumble up the letters and numbers so that it can't be guessed.
Try letting it be like A = 9, B = 25, C = 4, etc., using all the letters and numbers from 1 to 26.

ALGEBRAIC PROCESSING

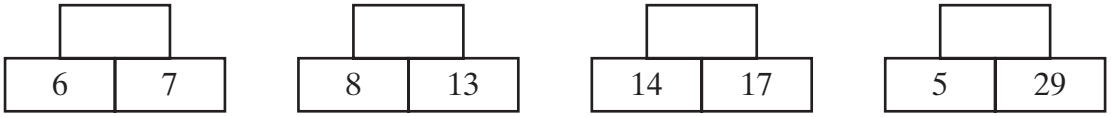
You can make Building Blocks by adding together the values on the step below.

Look at this:



since $4 + 5 = 9$

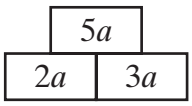
1 Try these:



You can also do the same thing in algebra by adding together.

BUT – **WARNING – you can only add them together when they are the same letter.**

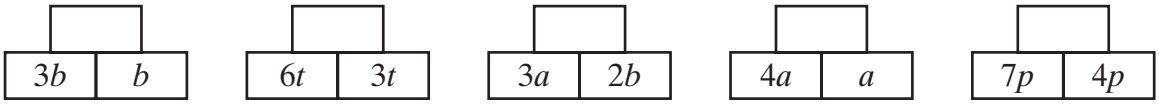
Look at this:



since $2a + 3a = 5a$

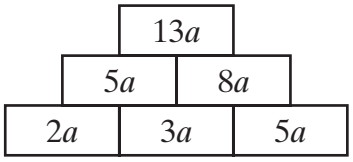
BUT in $2a + 3b$, the letters a and b have two different values, so you can't join them together.

2 Try these to get started:



Let's hope you didn't get the wrong answer for the third one.
Now use more Building Blocks.

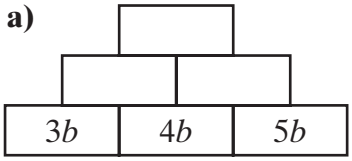
Look at this:



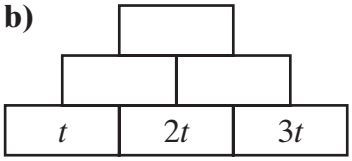
You just climb up the blocks, adding as you go.

3 Try these:

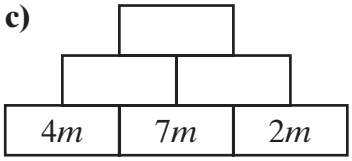
a)



b)



c)



4 Set these up for yourself using Building Blocks:

$p + p + 2p$ and $4r + r + 2r + 3r$ (You need more blocks this time.)

(continued)

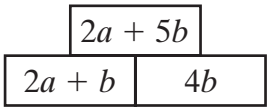
You must be very careful when two different letters are used:

REMEMBER: You can only join together like terms.

That means: $2a + 3b$ added to $4a + 2b$

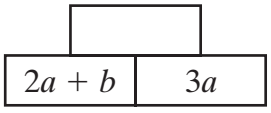
gives: $2a + 4a \rightarrow 6a$ and $3b + 2b \rightarrow 5b$ making $6a + 5b$

Adding:

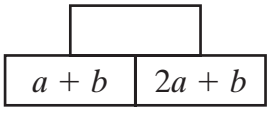


5 Try these.

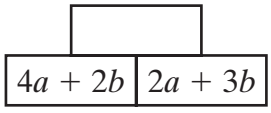
a)



b)



c)



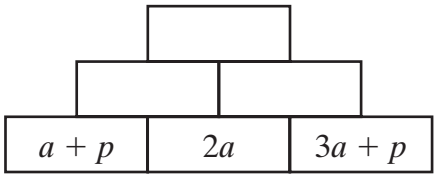
d) $6d + 4e$ $5d + 2e$

e) $2x + 3y$ $5x + 2y$

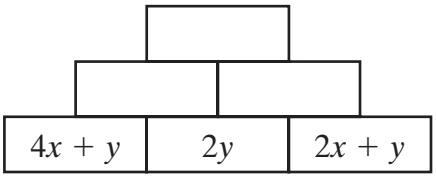
f) $2t + 3s$ $4s + 5t$

Now you are ready for the BIG ONES.
No help this time.

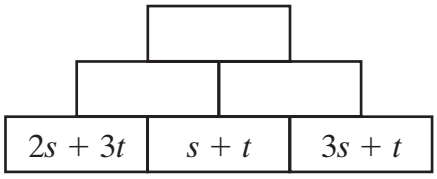
6 **a)**



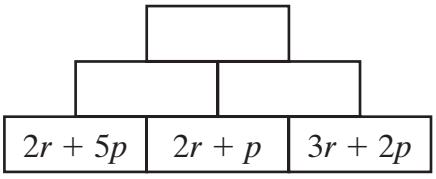
b)



c)



d)



7 Can you make up Building Blocks for these?

a) $4x + 2y$, $5x + y$, $2x + y$

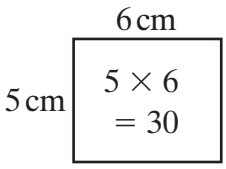
b) $4t + 3s$, $6s + 2t$, $4t + s$

c) $p + r$, $2p + 2r$, $3p + 3r$, $4p + 4r$

ALGEBRA AREAS

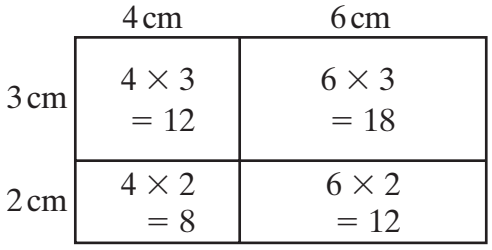
To find the AREA of a RECTANGLE, you times the LENGTH by the WIDTH.

Length 6 cm
Width 5 cm



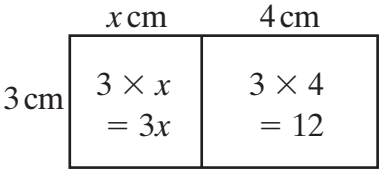
Area = $6 \times 5 = 30\ \text{cm}^2$

Suppose now we have:
Length 4 + 6 cm
Width 3 + 2 cm
It can be drawn like this:



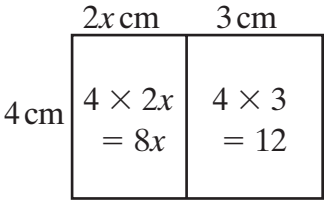
Area = 12 + 18 + 8 + 12
= $50\ \text{cm}^2$

You can do the same using letters.
Length x + 4 cm
Width 3 cm



Area = 3 times $(x + 4)$
= $3x + 12\ \text{cm}^2$
by adding the bit areas together

It also works with:
Length $2x$ + 3 cm
Width 4 cm

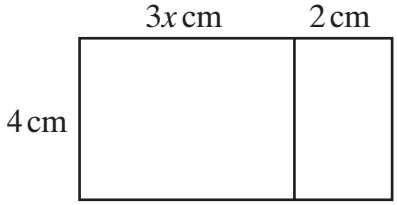


Area = 4 times $(2x + 3)$
= $8x + 12\ \text{cm}^2$
by adding the bit areas

Notice that 3 times x is written as $3x$ and 4 times $2x$ is $8x$
You do not need to draw the Rectangles to scale to make this work.

Make up Rectangle diagrams for these questions.

1 Length $3x$ + 2 cm
Width 4 cm



Area =
=

2 Length $2x$ + 1 cm
Width 5 cm

3 Length $5x$ + 4 cm
Width 2 cm

4 Length x + 3 cm
Width 7 cm

5 Length $5x$ + 14 cm
Width 5 cm

Let's see what happens when we have an 'x' in both the length and the width.

Rectangle
Length $x + 2$
Width $x + 3$

	x	2
x	$x \times x = x^2$	$2 \times x = 2x$
3	$3 \times x = 3x$	$3 \times 2 = 6$

Area is LENGTH times WIDTH

Remember: x times $x = x^2$

Area = $(x + 2)$ times $(x + 3)$

and adding the area bits together we have: $= x^2 + 3x + 2x + 6$

but we can join together the LIKE TERMS: $= x^2 + 5x + 6$

This is the final answer.

Try this one by filling in the boxes in the diagram and then sorting it out.

Rectangle
Length $x + 4$
Width $x + 3$

	x	4
x		
3		

Area = $(x + 4)$ times $(x + 3)$

= ..... Join together LIKE TERMS.

= .....

See if you can draw diagrams and work out the area for these rectangles.

6 Length $x + 1$ Width $x + 4$

7 Length $x + 2$ Width $x + 2$

8 Length $x + 4$ Width $x + 5$

9 Length $x + 5$ Width $x + 5$

10 Length $x + 6$ Width $x + 7$

NUMBER SEQUENCES

1 Jean is investigating **number sequences**.
She is colouring circles RED or BLUE.

RED sequence: 4, 8, 12, 16, ...
BLUE sequence: 5, 10, 15, 20, ...

The 4th, 8th, 12th, etc circles are coloured RED
The 5th, 10th, 15th, etc circles are coloured BLUE

a) Colour the circles for her and keep going until you reach the end!
(The 4th circle is the first red circle. The 5th circle is the first blue circle.)

b) Write a sentence about the RED sequence.

.....

c) Write a sentence about the BLUE sequence.

.....

d) Which circles do you colour RED and BLUE? Why?

.....

2 **a)** For the next sequence, add one (+1) to all the numbers in the RED and BLUE sequences.

NEW RED sequence: .....

NEW BLUE sequence: .....

b) Now colour in the NEW RED and NEW BLUE circles as you did before.
Keep going to the end!

c) Write sentences to say what you notice about the new sequences.

.....

.....

.....

.....

(continued)

3 Now investigate these two sequences:

GREEN sequence: 6, 12, 18, 24, ...
YELLOW sequence: 3, 6, 9, 12, ...

a) Write sentences as you did before.

.....

.....

.....

b) Now add one (+1) to each number in the sequences, and colour the new green and yellow circles.

NEW GREEN sequence: .....

NEW YELLOW sequence: .....

c) Write sentences about what you notice.

.....

.....

.....

4 See if you can make up two simple sequences of your own to investigate.
You will have to draw your own circles and say what you can see in the patterns.
Don't forget to add one (+1) to make the NEW sequence.

What would happen if you added on two instead of one?

.....

.....

.....

NUMBER RULES

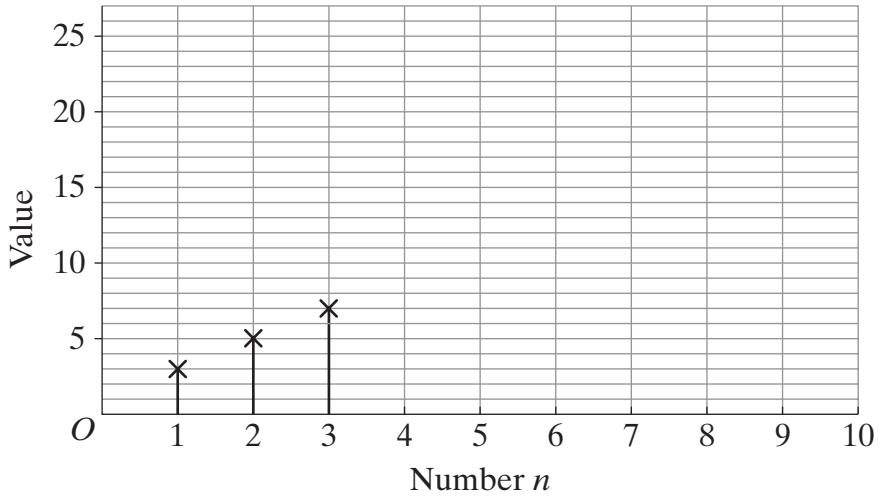
1 Complete the table using this RULE:

TWO TIMES TABLE ADD ONE

2	×	1	+	1	=	2	+	1	=	3
2	×	2	+	1	=	4	+	1	=	5
2	×	3	+	1	=	6	+	1	=	7
2	×	4	+	1	=	…	+	…	=	…
2	×	5	+	1	=	…	+	…	=	…
2	×	6	+	1	=	…	+	…	=	…
2	×	…	+	1	=	…	+	…	=	…
2	×	…	+	1	=	…	+	…	=	…
2	×	n	+	1	=	$2n$	+	1	=	Value

The letter 'n' can be any number which is multiplied by 2.
The sequence starts with $n = 1$, then $n = 2$, $n = 3$, and so on.

2 a) Draw a cross for each value on the graph below.
The first three crosses have been added for you.



The values go up by '2' each time.

b) Place a ruler along the first three crosses.
Notice that all the crosses lie along a straight line.
Because of this we can write:

Value = $2n + 1$

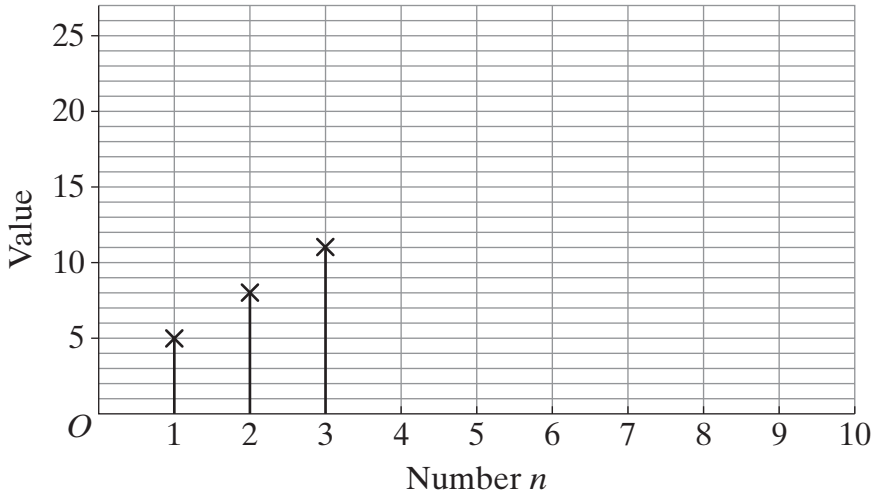
(continued)

3 As you did for question 1, use this RULE to fill the spaces in the table:

THREE TIMES TABLE ADD TWO

3	×	1	+	2	=	3	+	2	= 5
3	×	2	+	2	=	6	+	2	= 8
3	×	3	+	2	=	9	+	2	= …
3	×	4	+	…	=	…	+	2	= …
3	×	…	+	…	=	…	+	…	= …
…	×	…	+	…	=	…	+	…	= …
3	×	n	+	2	=	$3n$	+	2	= Value

4 a) Draw a cross for each value on the graph below to see how they go up.
The first three crosses have been added for you.



b) Place a ruler over along the first three crosses.
Then complete this sentence:

The values go up by …… each time.

5 See if you can use these two RULES to carry out the instructions in questions 3 and 4:

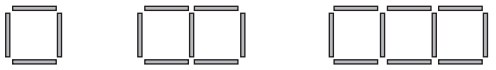
a) **THREE TIMES TABLE TAKE AWAY TWO**

b) **TWO TIMES TABLE ADD FIVE**

MAKING NUMBER SEQUENCES

Look at the square box shapes joined together.

1 Draw the next two shapes.



Shape 1 Shape 2 Shape 3 Shape 4 Shape 5

Shape 3 has **3 squares** and **8 outside edges**

2 Using the other shapes, complete this table.

Shape	Squares	Outside edges
1		
2		
3	3	8
4		
5		

3 Describe the pattern in words for the number of:

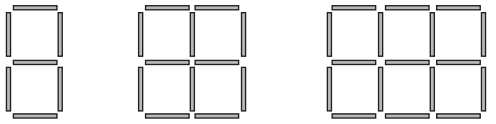
a) squares

.....

b) outside edges.

.....

4 Draw the next two shapes.



Shape 1 Shape 2 Shape 3 Shape 4 Shape 5

This shape has **4 squares and 8 outside edges**

5 Complete the table.

Shape	Squares	Outside edges
1		
2		
3		
4		
5		
6		
7		
8		

(continued)

You should have been able to complete the table by looking at the number sequence rather than by drawing extra shapes.

6 Describe the pattern in words for the number of:

a) squares

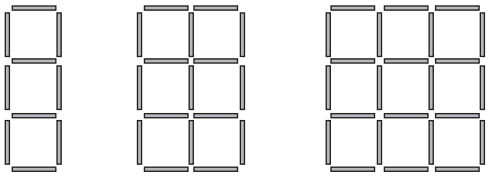
.....

b) outside edges.

.....

These shapes are now made larger in 'triples'.

7 Draw the next two shapes.



Shape 1 Shape 2 Shape 3 Shape 4 Shape 5

8 Complete the table below.

Shape	Squares	Outside edges
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

9 Describe any patterns you see in the table.

.....

.....

Harry says that it is possible to have the same number of squares as outside edges.

10 Can this be true? …… If so, draw the shape to prove it!

KEYWORDS

The sentences below tell us about the ideas in Chapter 9.
But the important KEYWORDS have become jumbled up.

Unscramble the KEYWORDS and make a list of them in the space below.
Some of the words appear more than once in the sentences.

HINT: All these words are in the chapter, so if you are not sure of the spelling, look for them before you write them down in the list.

This chapter is about RMUBNE ENUESQECS.

We look for a TENPRAT in the RUMBEN NECESQUE and try to get a ALMORFU.

There are SNAPRETT to help us find a LEUR.

Some have DOD and NEEV RBNESUM.

There are also SUREQA, BUCE and LIRTAGEN MUSERNB.

To find a SAWERN to a NEQIOTUS, we sometimes look at the STIEM ALEBT.

One MERT can lead to the TENX, and looking at the OMOCNM EFIDEERNFC can produce a EVOPITSI or a ETENGAIV result.

Keywords list

.....

.....

.....

.....

.....

.....

'EEK!'

104 mm	9.3 cm	3.1 cm	18 mm	111 mm	5.4 cm	97 mm	4.1 cm	14 mm
53 mm	5.8 cm	83 mm	8.3 cm	61 mm	2.2 cm	11.7 cm	31 mm	2.5 cm
25 mm	7.2 cm	47 mm	12.7 cm	54 mm	123 mm	6.5 cm	10.4 cm	36 mm
1.4 cm	41 mm	6.1 cm	3.6 cm	58 mm	10 cm	22 mm	72 mm	5.3 cm
12.3 cm	65 mm	117 mm	11.1 cm	93 mm	4.7 cm	127 mm	1.8 cm	9.7 cm

Measure the lines **A** to **M** in centimetres and millimetres, and colour in the squares with these measurements.
The first one has been done for you.

Eek, what have you drawn?

A _____

B _____

C _____

D _____

E _____ (in cm only)

F _____

G _____

H _____

I _____

J _____

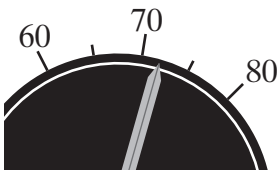
K _____

L _____

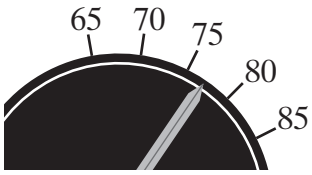
M _____

Worksheet 11S.2

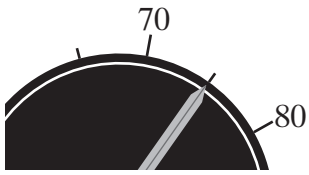
1 Three cars are racing.
Their speedometers show the speeds in miles per hour.



Audi



BMW

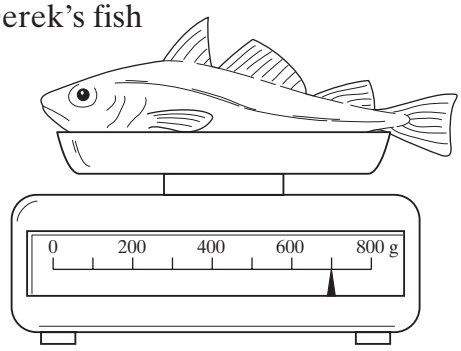


Chrysler

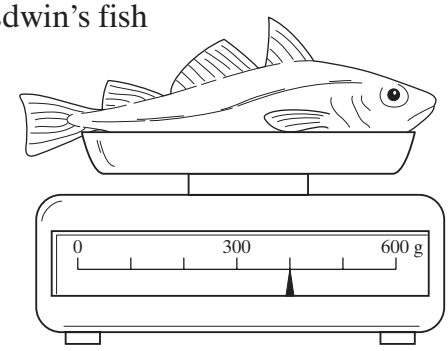
a) Estimate the speed for each car.
b) Which car is going the fastest?

2 Derek, Edwin, Fabian and Gary have a fishing competition.
Their fish are weighed on the scales.

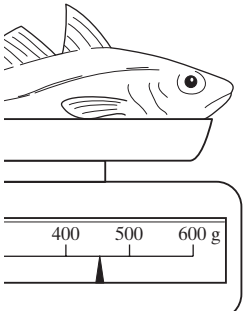
Derek's fish



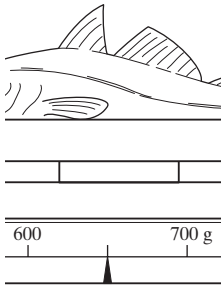
Edwin's fish



Fabian's fish



Gary's fish



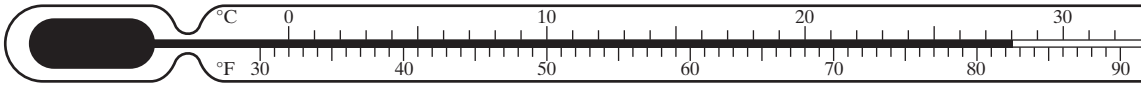
Complete the table.

Name	Weight of fish (g)	Position in competition

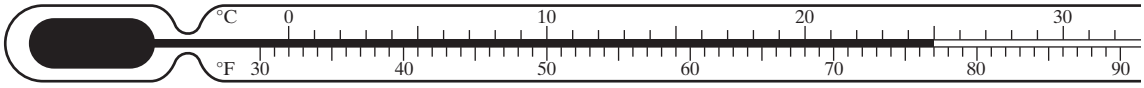
(continued)

3 The caretaker takes the temperature in four classrooms of her school.

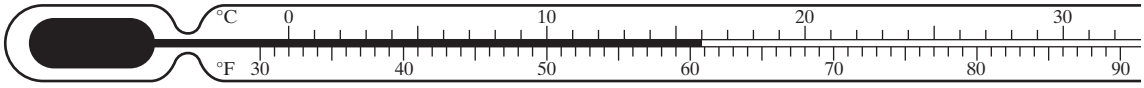
Humanities



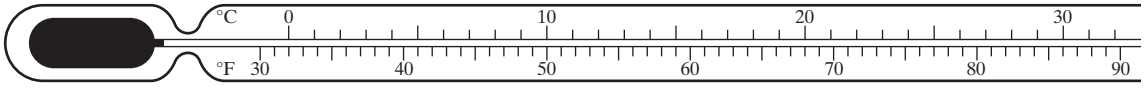
Technology



Maths



English



From the thermometer in each classroom, estimate temperature in °C and °F, and fill in the first three rows of the table.

Room	Temperature (°C)	Temperature (°F)
Humanities		
Technology		
Maths		
English	21	

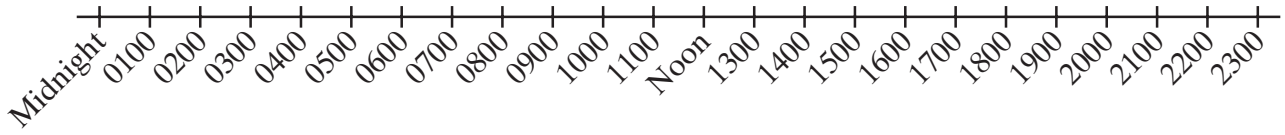
The temperature in the English room is 21 °C
Draw this on the fourth thermometer.
Read from the scale what temperature this is in °F, and complete the table.

Worksheet 11.1

1 Five students write the time that they go to bed in the evening.
Write these times underneath using the 24-hour clock.

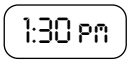
	Heidi	**Iqbal**	**Jarad**	**Kaleb**	**Lea**
12-hour period	10.00 pm	9.45 pm	10.45 pm	8.30 pm	11.55 pm
24-hour clock					

2

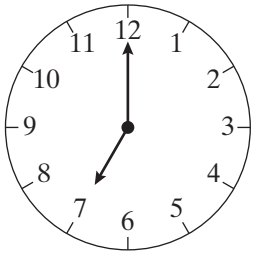


Mark the following times on the 24-hour scale above.

a) Half past nine in the morning **b)** 3.30 pm

c) Eight o'clock in the evening **d)** 

e) Morning



3

BBC1	**ITV**
1630 SMART	1630 My Parents are Aliens
1700 Dance Factory	1700 The Paul O'Grady Show
1725 Newsround	1800 News Tonight
1735 Neighbours	1900 Emmerdale
1800 BBC News	

Use the information in the table to answer these questions.

a) How long does Newsround last? .....

b) What begins on BBC1 thirty-five minutes after Dance Factory? .....

c) Which two programmes above are the longest? .....

.....

d) If the ITV News tonight overruns by quarter of an hour, what time will Emmerdale start?

.....

(continued)

4 Match up the pieces of information that show the same times.

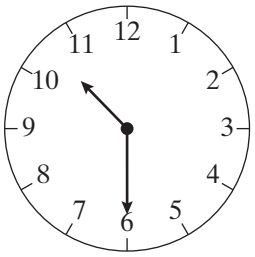
a) 2025

b) 2345 flight to Mombasa will be delayed

c) 10.30 am

d) 'This morning I got up at half past seven.'

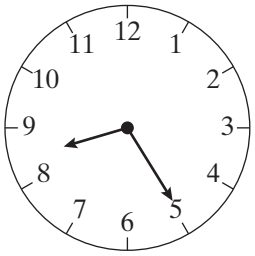
e)



f)

Please ensure all rooms are empty by 1800 hours

g)



h) 11.45 pm

i) 6 pm **BBC1 World News**

j) 'The train leaving platform 2 is the 0730 to Bedford.'

Use this information in questions 5 and 6.
1 year = 365 days; 1 day = 24 hours; 1 hour = 60 minutes; 1 minute = 60 seconds

5 **a)** Write down your age in years. .....

b) Work out how many days this is. .....

c) How many seconds have you lived? .....

6 The table below shows approximate journey times in minutes between five cities in France.

Paris					
580	**Bordeaux**				
290	880	**Calais**			
200	680	170	**Dieppe**		
800	650	1100	1000	**Marseilles**	
950	800	1250	1150	200	**Nice**

a) A car drives from Calais to Marseille.
Read from the table how many minutes this will take. .....

Use your calculator to convert this time into hours and minutes. .....

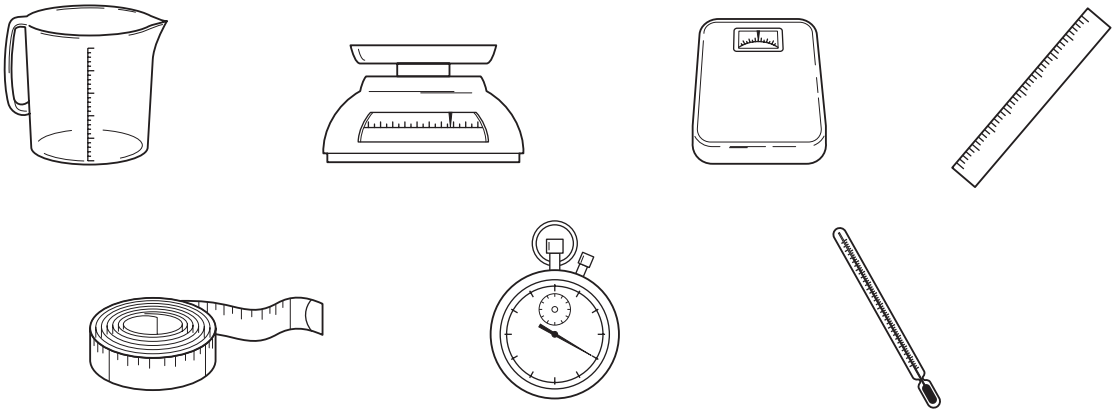
b) Which 2 cities are the furthest apart in time? .....

c) François drives from Paris to Dieppe and back.
How many minutes is his journey in total? .....

How long is this in hours and minutes? .....

Worksheet 11.2

1 Choose one of the following measuring devices to measure each item below.



a) Child's temperature .....

b) A length freestyle swimming .....

c) Butter for a cake .....

d) Length of your arm .....

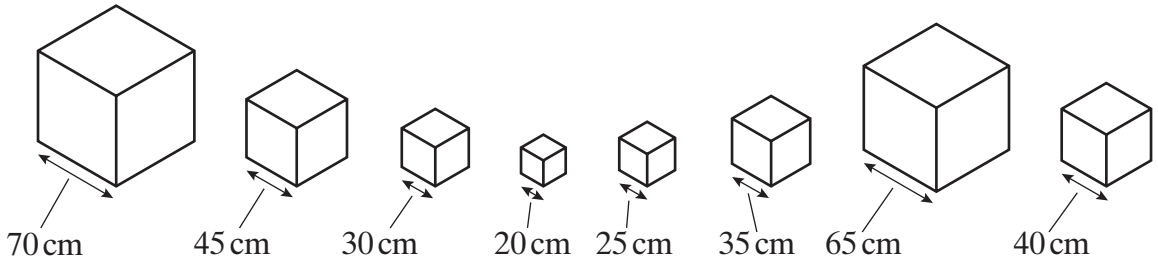
e) Amount of lemonade in a can .....

f) Length of a pencil .....

g) Weight of an adult .....

Suggest a metric unit that you might measure each of these in.

2 Matthew has eight cubes of different sizes.
He wants to build a tower that is the same height as he is.
Matthew measures his height as 1.35 m



a) Choose two cubes that would make the tower the correct height. .....

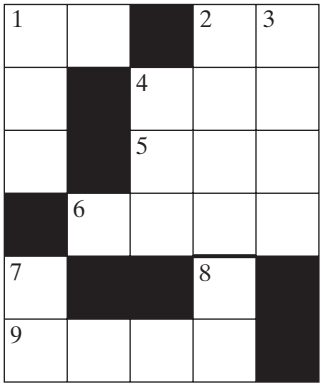
b) Which three cubes could Matthew use? .....

c) Are there three different cubes that also make a height of 1.35 m? .....

d) What is the smallest tower he could build using five cubes? .....

(continued)

3 Complete the conversions to fill in the crossnumber.



Across

1 5 cm = ? mm
2 2500 cm = ? m
4 3 l = ? cl
5 $\frac{1}{2}$ km = ? m
6 9 kg = ? g
9 7 m = ? mm

Down

1 0.5 kg = ? g
2 2 tonne = ? kg
3 5 l = ? ml
4 3.5 m = ? cm
7 27 000 g = ? kg
8 8000 cm = ? m

4 Carry out the following conversions.

a) The largest land mammal is the African elephant, which can weigh up to 7 tonnes.
How many kg is this? .....

b) The shortest recorded man is 57 cm tall.
How many mm is this? .....

c) The heaviest lady weighs in at 544 kg.
How many grams is this? .....

d) The tallest man stood 2.77 m high.
What is this in cm? .....

e) The most tea consumed per person is in Ireland where each person drinks approximately 230 litres a year.
What is this in ml? .....

Worksheet 11.3

1 Circle the unit that is the odd one out.

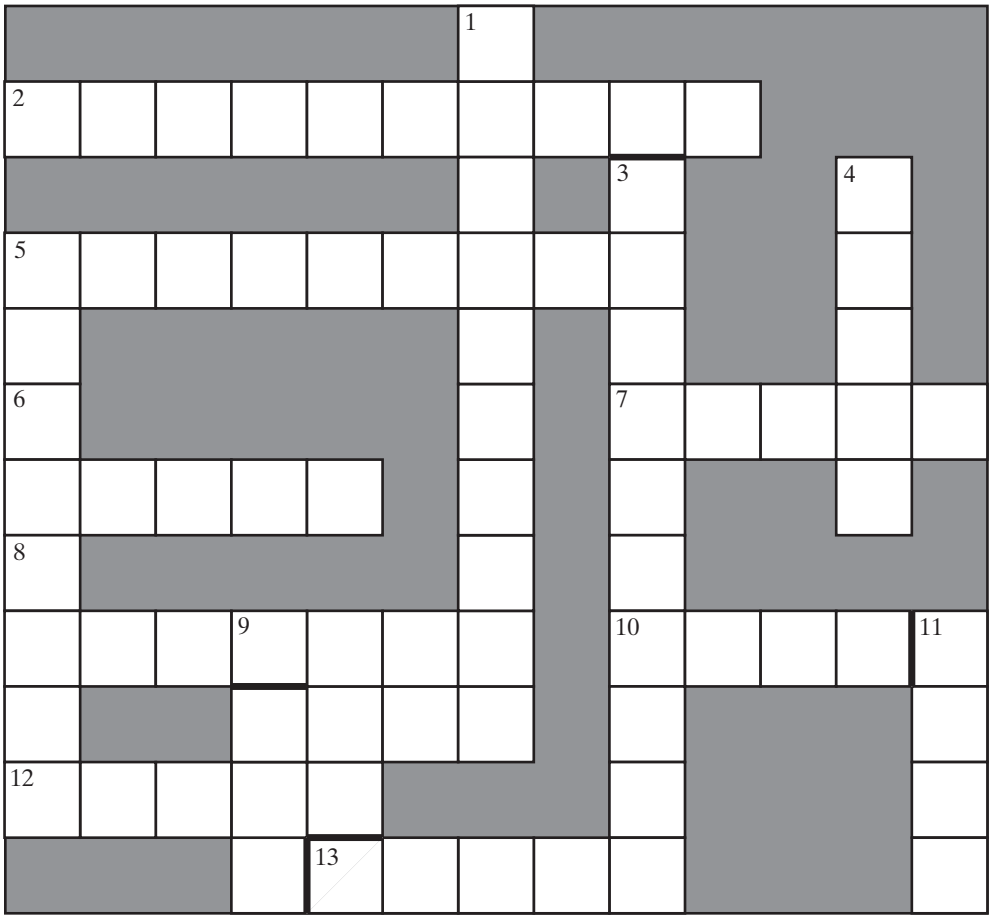
a) km cm yd kg

b) gallon foot litre pint

c) kg lb l g

d) mile millimetre ounce inch

2 Complete the crossnumber using the abbreviations as clues.



Across

2 mm
5 km
6 l
7 t
8 g
10 ″ (length)
12 m
13 oz

Down

1 cm
3 cl
4 lb
5 kg
9 yd
11 ′ (length)

3 Convert the following sports measurements to an approximate metric equivalent.

a) Cricket: The batting pitch is 22 yards, which is 66 feet. (m) .....

b) Rugby Union: Ten rugby balls weigh 11 lb. (kg) .....

c) Football: The penalty box is 18 yards or 54 feet. (m) .....

d) Netball: The goal is 120 inches high. (cm) .....

e) Tennis: The width of the doubles court is 36 feet. (cm) .....

f) Athletics: The marathon is run on a course of just over 26 miles (km) .....

Worksheet 11.4/11.5

1 A coach travels 180 miles in 3 hours.
What is the average speed for the journey?

$$\textbf{Speed} = \frac{\textbf{distance}}{\textbf{time}}$$

$$\text{Speed} = \frac{\text{.....}}{\text{.....}} = \text{..... miles per hour}$$

2 Mr Adams travels 20 kilometres to work by car. It takes 30 minutes. What is his average speed?

30 minutes $= \frac{1}{2}$ hour

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$\text{Speed} = \frac{\text{.....}}{\text{.....}} = \text{..... kilometres per hour}$$

3 **a)** The Head of PE can run 100 m in 12.5 s.
Use your calculator to work out his speed in m/s. .....
b) In 2002 the fastest time run for the 100 m was 9.78 s.
Calculate the runner's average speed in m/s to 1 d.p. .....

4 Kerry flies from Gatwick to Aberdeen. The flight takes 2 hours.
The plane flies at an average speed of 300 miles per hour.
How far in miles is it from Gatwick to Aberdeen?

Distance = speed × time

Distance = ... × ..... = ... miles

5 Angelina and Brad leave home to go to a party. Angelina lives 7.5 km away and walks at 5 km/h
Brad lives 24 km away and cycles at 12 km/h

$$\textbf{Time taken} = \frac{\textbf{distance}}{\textbf{speed}}$$

Who gets to the party first? .....

6 Use these formulae to find the missing values in the table:
Density = mass / volume
Mass = density × volume
Volume = mass / density

	Density	**Mass**	**Volume**
Water	..... kg/m^3	2000 kg	2 m^3
Silver	10.5 g/cm^3	..... g	10 cm^3
Gold	19.3 g/cm^3	1930 g	..... cm^3

Worksheet 11.6

1 Circle the number(s) that round to the figure given on the right.

a) 18.9 18.3 18.4 18.5 19.1 **19**

b) 4.1 3.2 3.5 3.9 4.5 **4**

c) 47.6 47.2 48.2 47.5 48.5 **48**

2 Which whole number is each of the following closest to?

a) 6.2 .....

b) 7.9 .....

c) 18.51 .....

d) 52.4 .....

e) 2.3 .....

f) 20.49 .....

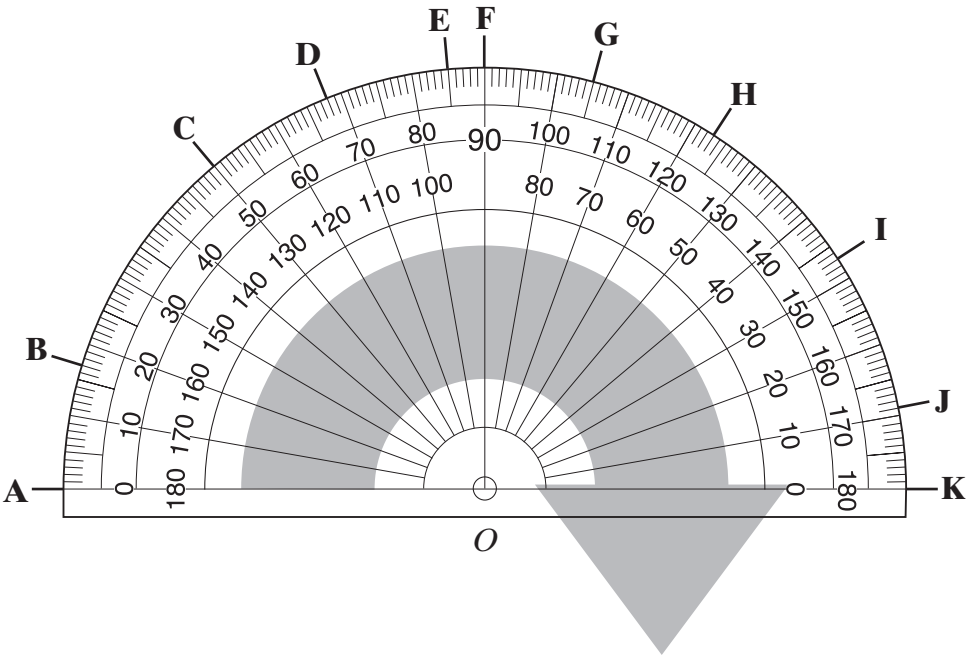
g) 59.5 .....

3 The numbers below are values of measurements in centimetres.
Circle the biggest (upper bound) number and the smallest (lower bound) number that would give a value of 9 cm to the nearest centimetre.

8.0 8.1 8.2 8.3 8.4 8.5 8.6 8.7 8.8

8.9 9.0 9.1 9.2 9.3 9.4 9.5 9.6 9.7

Worksheet 13S



Write down the measurements of the angles below.
Two have been done for you.

1 Angle AOD = **68°**

2 Angle AOC = ...

3 Angle AOJ = ...

4 Angle AOF = ...

5 Angle AOH = ...

6 Angle KOG = ...

7 Angle KOD = ...

8 Angle KOJ = ...

9 Angle KOB = ...

10 Angle KOF = ...

11 Angle BOC = **33°**

12 Angle HOJ = ...

13 Angle FOD = ...

14 Angle DOH = ...

15 Angle EOD = ...

16 Angle IOK = ...

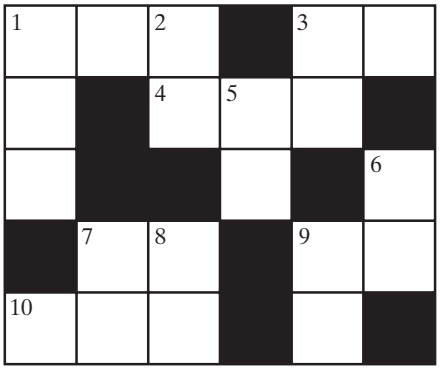
17 Angle FOH = ...

18 Angle BOG = ...

19 Angle DOJ = ...

20 Angle COE = ...

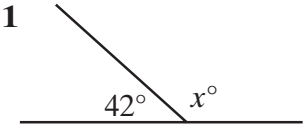
Worksheet 13.1



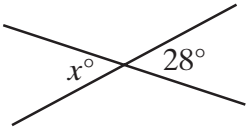
Work out the size of each angle marked x^2.
Use your answers to complete the crossnumber puzzle.

Across

1



3



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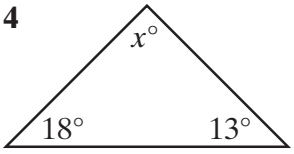

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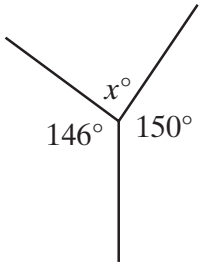

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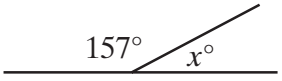

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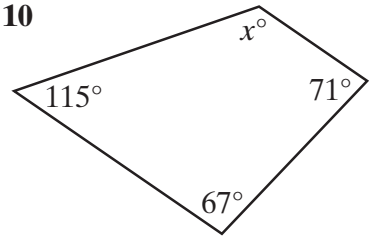
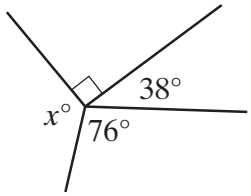


Down

1



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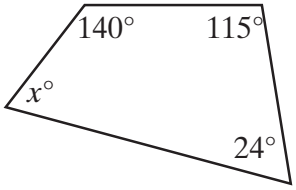

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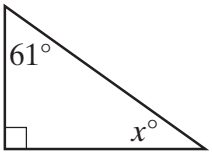

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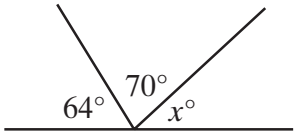

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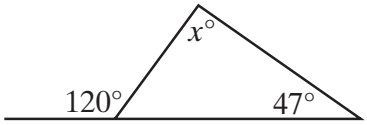

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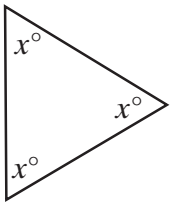

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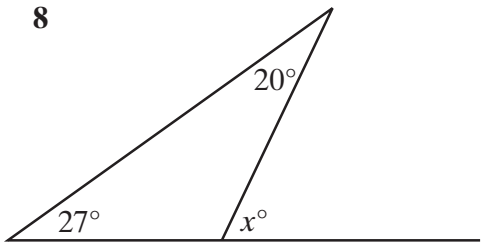

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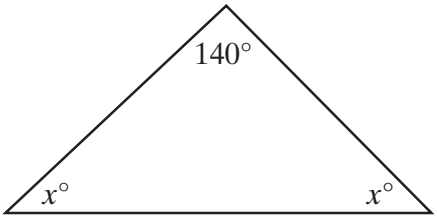
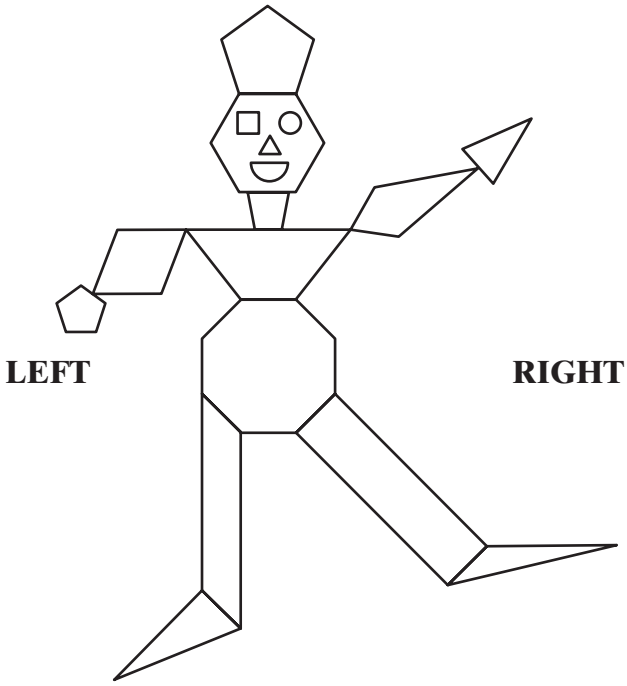


SHAPES IN POLLY

Polly is made up from different shapes.
Write down the name of the shape that matches the word.
Choose from the answers below the diagram.
One shape is repeated twice.



circle	**equilateral triangle**	**pentagon**
square	**isosceles triangle**	**trapezium**
rhombus	**right-angled triangle**	**kite**
rectangle	**parallelogram**	**semicircle**
hexagon	**obtuse-angled triangle**	**octagon**

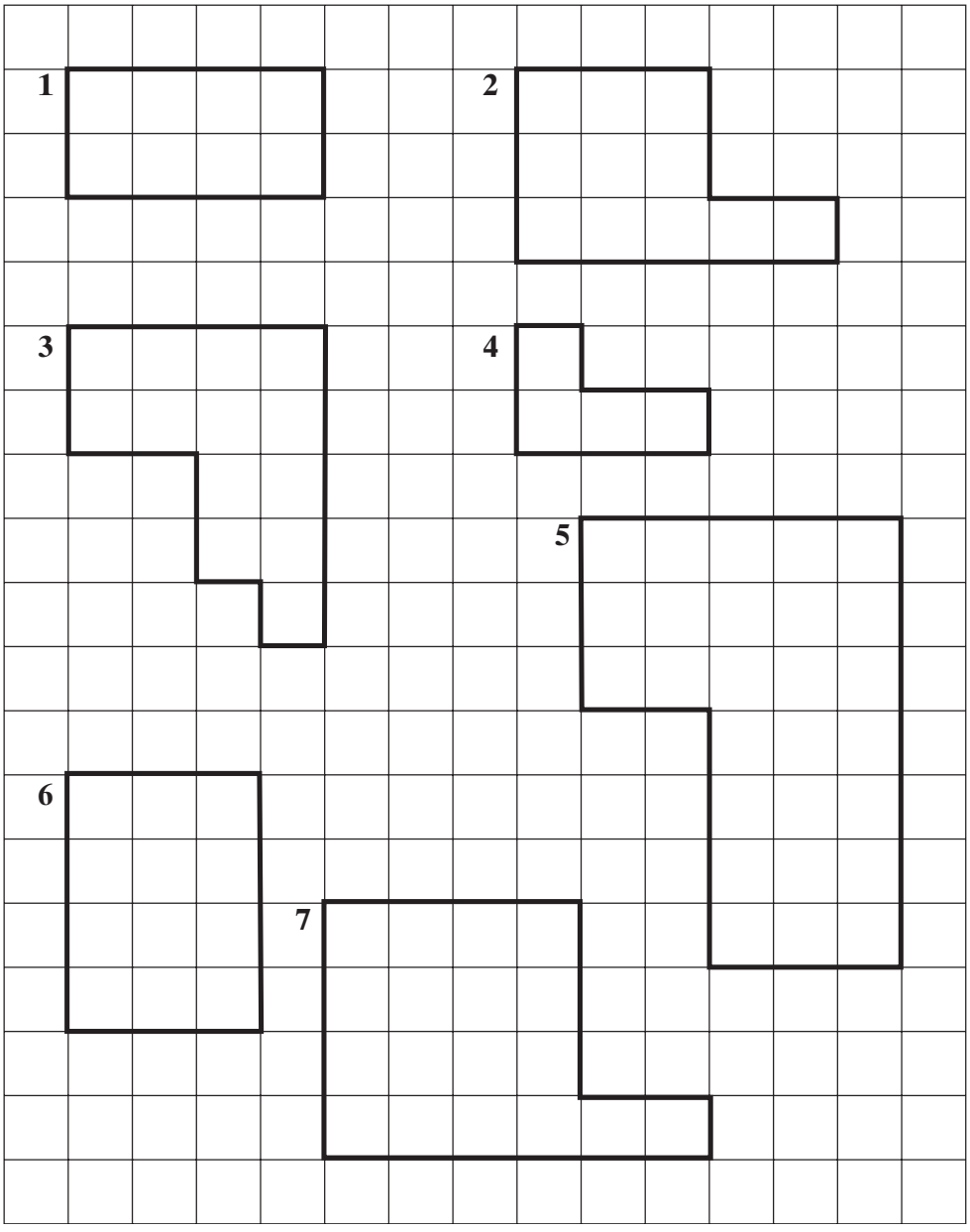
1 Right leg ..... **9** Hat .....
2 Left eye ..... **10** Mouth .....
3 Right arm ..... **11** Left leg .....
4 Left hand ..... **12** Lower body .....
5 Face ..... **13** Right foot .....
6 Left foot ..... **14** Left arm .....
7 Neck ..... **15** Right eye .....
8 Right hand ..... **16** Nose .....

HOW MR SMART GETS TO SCHOOL

Work out the area **A** and perimeter **P** of each shape below, and write them in the table.

Shape	1	2	3	4	5	6	7
A							
P							

Now look for each quantity in the shapes of the grid on the next page.
Shade in all the squares of the shapes marked with your quantities.
For example, if the Perimeter of a shape below is 8, then shade the squares of the shape labelled P8 on the next page.
If the Area of a shape below is 6, then shade the squares in the shape labelled A6.
You will then see how Mr Smart gets to school.



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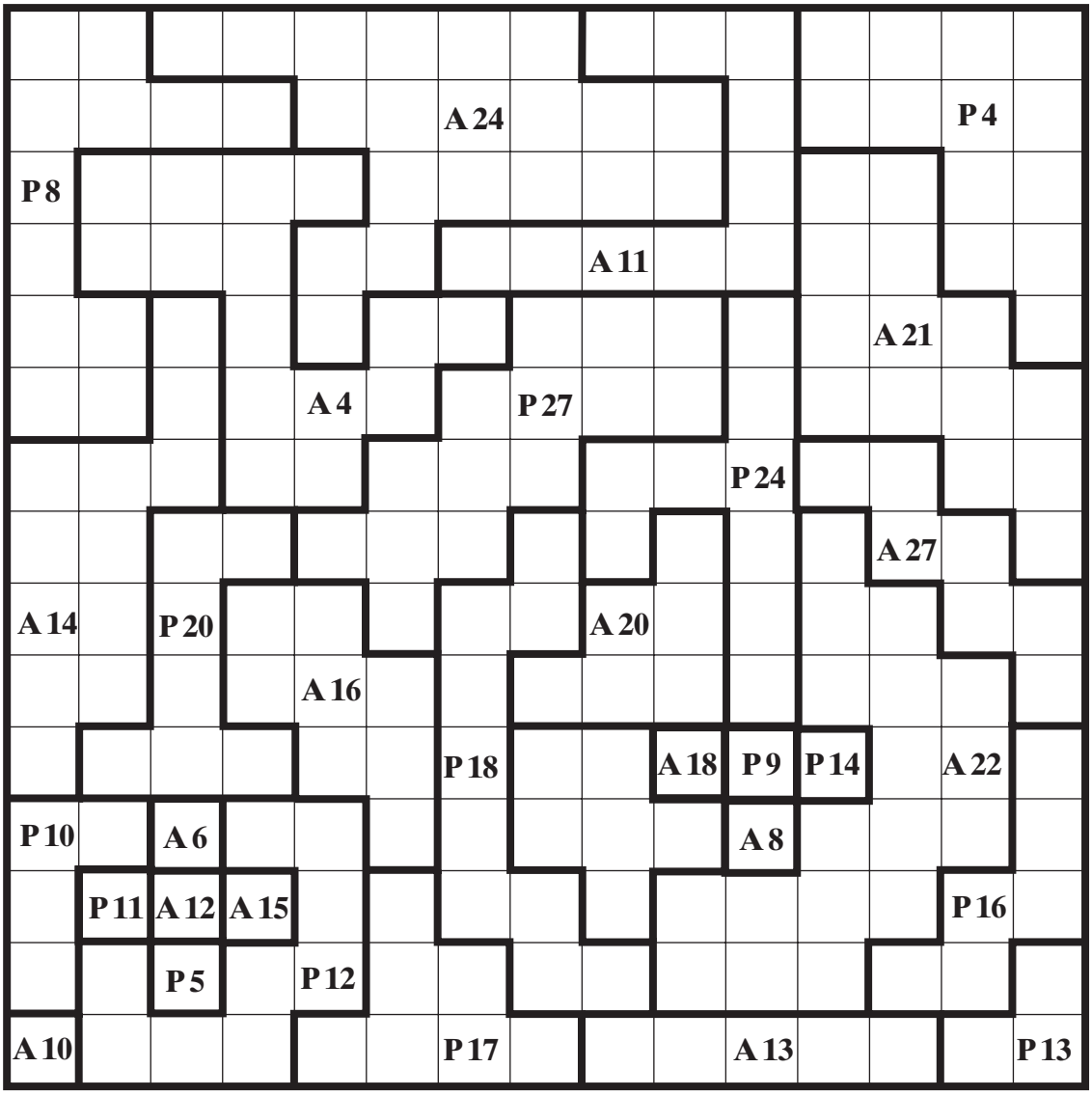
A 24
P 4
P 8
A 11
A 21
A 4
P 27
P 24
A 27
A 14
P 20
A 20
A 16
P 18
A 18
P 9
P 14
A 22
P 10
A 6
A 8
P 11
A 12
A 15
P 16
P 5
P 12
A 10
P 17
A 13
P 13