

About Add-ons

Add-ons are part of the T5 ('Targeting level 5') pack. There are twelve Add-ons, each covering one of the major areas of mathematics drawn from the level 4–6 Key Stage 3 National Curriculum test papers, with a particular emphasis on those areas crucial for achieving level 5.

Each Add-on includes four to seven selected questions (mostly at level 4 and level 5) on the following topics:

- 1 Number: place value
- 2 Number: money problems
- 3 Number: percentages and fractions
- 4 Algebra: sequences and patterns
- 5 Algebra: expressions
- 6 Shape and space: area and perimeter
- 7 Shape and space: 2-D to 3-D
- 8 Shape and space: shapes and angles
- 9 Shape and space: transformations
- 10 Handling data: interpreting data
- 11 Handling data: pie charts
- 12 Handling data: probability

Using Add-ons

Add-ons can be used in a variety of ways.

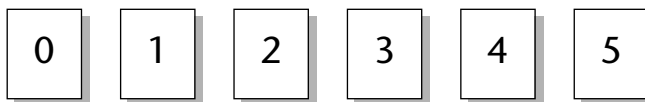
- Add-ons can be programmed into normal lessons as the content for the middle part of the lesson. Most will take less than 20 minutes to complete. It is important that pupils check their work, and 5–10 minutes of the lesson could be used to go over the work that has been completed. Pupils could work individually or in pairs; it may be helpful to ask individual pupils to explain their working to the rest of the class or to a smaller group. At all times pupils need to have feedback on the work that they have done.
- Add-ons are suitable for homework assignments, but again it is important that the work is completed and that there is formative feedback.
- Add-ons can be used as an assessment tool. The content covers the majority of the level 5 (Years 7–8) key learning objectives. Successful completion of the questions of a particular Add-on suggests that pupils have a sound knowledge of that key learning objective.

Number: place value

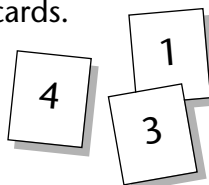
1 Cards

LEVEL 4

Here are some number cards.



Joan picked these three cards.



She made the number 314 with her cards.

(a) Make a smaller number with Joan's three cards.

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1 mark

(b) Make the biggest number you can with Joan's three cards.

1 mark

(c) Joan made the number 314 with her three cards.
Which extra card should she pick to make her number 10 times as big?

--

1 mark

What number is 10 times as big as 314?

1 mark

(d) Andy has these cards.



He made the number 42.5 with four of his cards.
Use some of Andy's cards to show the number 10 times as big as 42.5

1 mark

Use some of Andy's cards to show the number 100 times as big as 42.5

1 mark

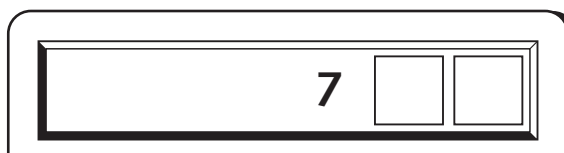
2 Digits

LEVEL 4

(a) Claire puts a 2-digit whole number into her calculator.

She multiplies the number by 10.

Fill in one other digit which you know must be on the calculator display.

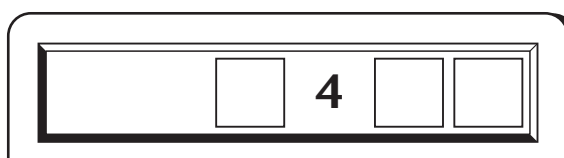


1 mark

(b) Claire starts again with the same 2-digit whole number.

This time she multiplies it by 100.

Fill in all the digits that might be on the calculator display.



2 marks

3 Missing numbers

LEVEL 4–5

Write **one** number at the end of each equation to make it correct.

Example $26 + 34 = 16 + 44$

(a) $38 + 17 = 28 + \underline{\hspace{2cm}}$

1 mark

(b) $38 - 17 = 28 - \underline{\hspace{2cm}}$

1 mark

(c) $40 \times 10 = 4 \times \underline{\hspace{2cm}}$

1 mark

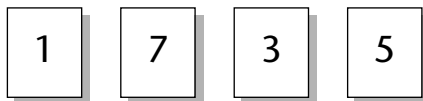
(d) $7000 \div 100 = 700 \div \underline{\hspace{2cm}}$

1 mark

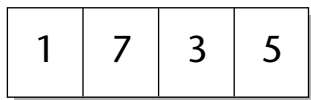
4 Arrangements

LEVEL 4–5

Here are some number cards.



You can use each card once to make the number 1735, like this.

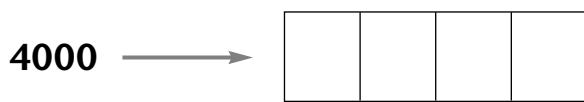


Use the four number cards to make numbers that are as close as possible to the numbers written below.

Example



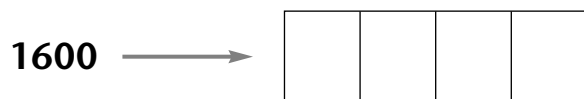
You must **not** use the same card more than once in each answer.



1 mark



1 mark



1 mark

5 Numbers

LEVEL 5

Here is a list of numbers.

-7 -5 -3 -1 0 2 4 6

You can choose some of the numbers from the list and add them to find their total.

For example

$$6 + -1 = 5$$

(a) Choose two of the numbers from the list which have a total of 3

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = 3 \quad 1 \text{ mark}$$

(b) Choose two of the numbers from the list which have a total of -1

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = -1 \quad 1 \text{ mark}$$

(c) What is the total of all eight of the numbers on the list?

$$\underline{\hspace{2cm}} \quad 1 \text{ mark}$$

(d) Choose the three numbers from the list which have the lowest possible total.

Write the three numbers and their total.

You must not use the same number more than once.

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \quad 2 \text{ marks}$$

Number: money problems

1 Stamps

LEVEL 4



Stamps are 19p each.

Gwyn wants to buy 9 stamps.

He knows that he will have to pay less than £2.

- (a) Show how you can tell that he will have to pay less than £2 without working out the exact answer.

1 mark

- (b) Gwyn buys 9 stamps at 19p each.
Work out exactly how much he must pay.

_____ 1 mark

2 Museum

LEVEL 5

Museum
Entrance fee £1.20 per person

- (a) 240 people paid the entrance fee on Monday.
How much money is that altogether?
Show your working.

£ _____ 2 marks

- (b) The museum took £600 in entrance fees on Friday.
How many people paid to visit the museum on Friday?
Show your working.

_____ people 2 marks



3 Cassettes

LEVEL 4-5

- (a) A shop sells video tapes for £2.50 each.
What is the cost of 16 video tapes?

£ _____ 1 mark

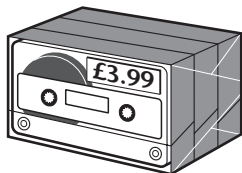


- (b) The shop sells audio cassettes.
Each cassette costs £1.49
What is the cost of 4 cassettes?

£ _____ 1 mark

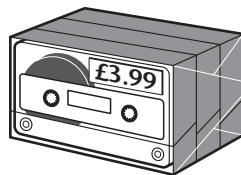
- (c) How many cassettes can you buy with £12?

_____ cassettes 1 mark



- (d) The shop also sells cassettes in packs of three.
A pack costs £3.99
How many packs can you buy with £12?

_____ packs 1 mark



Pack of three: £3.99

Single cassette: £1.49

- (e) What is the greatest number of cassettes you can buy with £15?
You can buy some packs and some single cassettes.

_____ 1 mark

4 Kites

LEVEL 5

Gwen makes kites to sell. She sells the kites for £4.75 each.

- (a) Gwen sells 26 kites.
How much does she get for the 26 kites?

£ _____ 2 marks

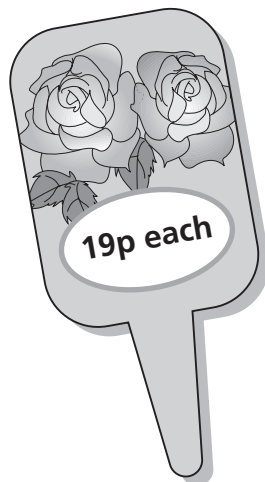
- (b) Gwen has a box of 250 staples.
She uses 16 staples to make each kite.
How many complete kites can she make using the 250 staples?

_____ kites 2 marks

5 Plants

LEVEL 5

(a) A shop sells plants.



Find the cost of 35 plants.
Show your working.

£ _____

2 marks

(b) The shop sells trees.



Mr Bailey has £250. He wants to buy as many trees as possible.
How many trees can Mr Bailey buy?
Show your working.

_____ trees

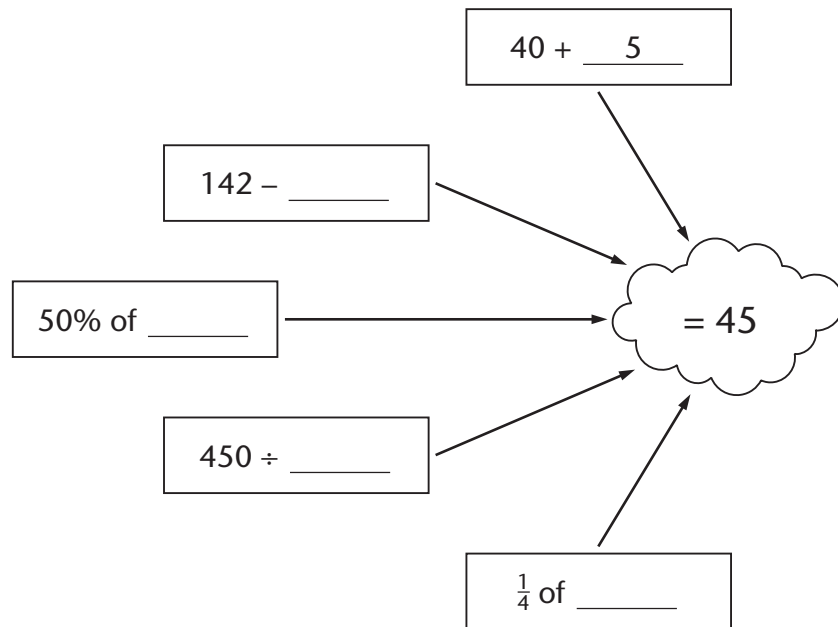
2 marks

Number: percentages and fractions

1 Forty-five

LEVEL 4

- (a) Fill in the missing numbers so that the answer is always 45.
The first one is done for you.



4 marks

- (b) Fill in the gaps below to make the answer 45.
You may use any of these signs: + - × ÷

$$28 \quad \underline{\hspace{1cm}} \quad 2 \quad \underline{\hspace{1cm}} \quad 31 = 45$$

1 mark

2 Twenty-seven

LEVEL 4

- (a) Fill in the missing numbers.

$$25\frac{1}{2} + \underline{\hspace{3cm}} = 27$$

1 mark

$$150 - \underline{\hspace{3cm}} = 27$$

1 mark

$$50\% \text{ of } \underline{\hspace{3cm}} = 27$$

1 mark

$$\text{a quarter of } \underline{\hspace{3cm}} = 27$$

1 mark

- (b) Write numbers in each space below to make the calculations correct.

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = 27$$

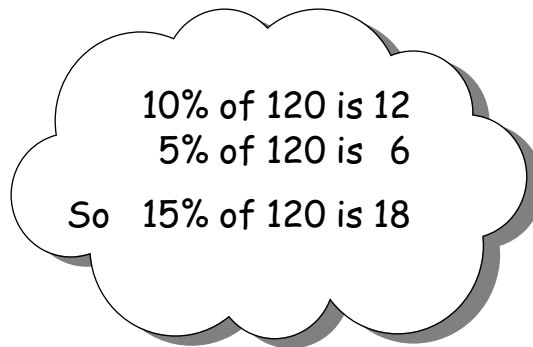
$$\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = 27$$

1 mark

3 Headwork

LEVEL 4–5

This is how Caryl works out 15% of 120 in her head.



(a) Show how Caryl can work out $17\frac{1}{2}\%$ of 240 in her head.

_____ % of 240 is _____

_____ % of 240 is _____

_____ % of 240 is _____

So $17\frac{1}{2}\%$ of 240 is _____

2 marks

(b) Work out 35% of 520.
Show your working.

2 marks

4 Percentages A

LEVEL 5

The table shows some percentages of amounts of money.

	£10	£30	£45
5%	50p	£1.50	£2.25
10%	£1	£3	£4.50

You can use the table to help you work out the missing numbers.

15% of £30 = £_____

1 mark

£6.75 = 15% of £_____

1 mark

£3.50 = _____% of £10

1 mark

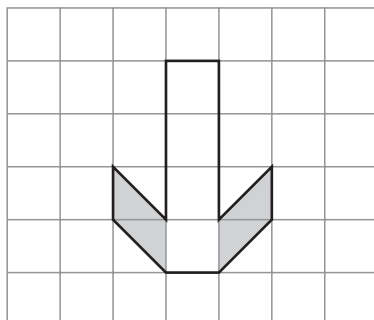
25p = 5% of £_____

1 mark

5 Shapes

LEVEL 5

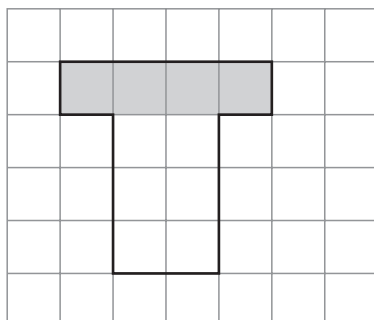
(a) What fraction of this shape is shaded?



Write your fraction as simply as possible.

1 mark

(b) What percentage of this shape is shaded?

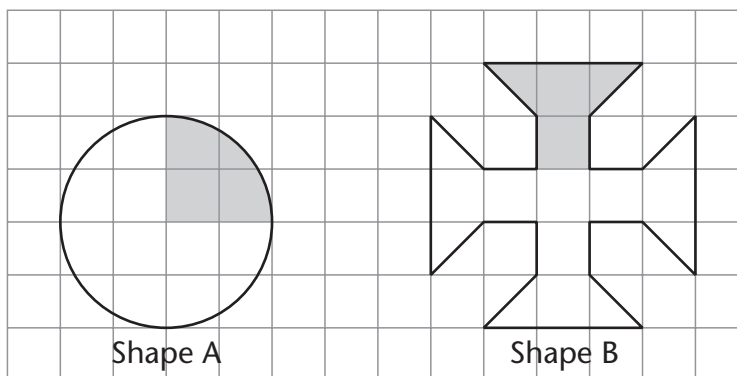


_____ %

1 mark

(c) Which shape has the greater percentage shaded?

Tick (✓) the correct box.



Shape A Shape B Both the same

Explain how you know.

6 Percentages B

LEVEL 5

Calculate these.

$$8\% \text{ of } £26.50 = £\underline{\hspace{2cm}}$$

1 mark

$$12\frac{1}{2}\% \text{ of } £98 = £\underline{\hspace{2cm}}$$

1 mark

7 Lambs

LEVEL 6

On a farm 80 sheep gave birth.

30% of the sheep gave birth to two lambs.

The rest of the sheep gave birth to just one lamb.

In total, how many lambs were born?

Show your working.

_____ lambs

2 marks

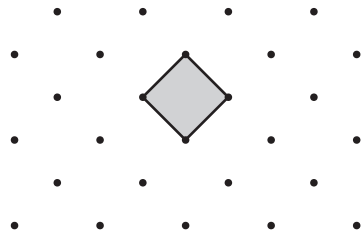
Algebra: sequences and patterns

1 Squares

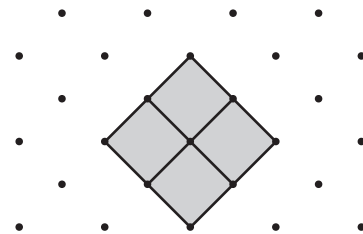
LEVEL 4

Kath puts 1 small square tile on a square dotted grid.

Den makes a bigger square with 4 small square tiles.



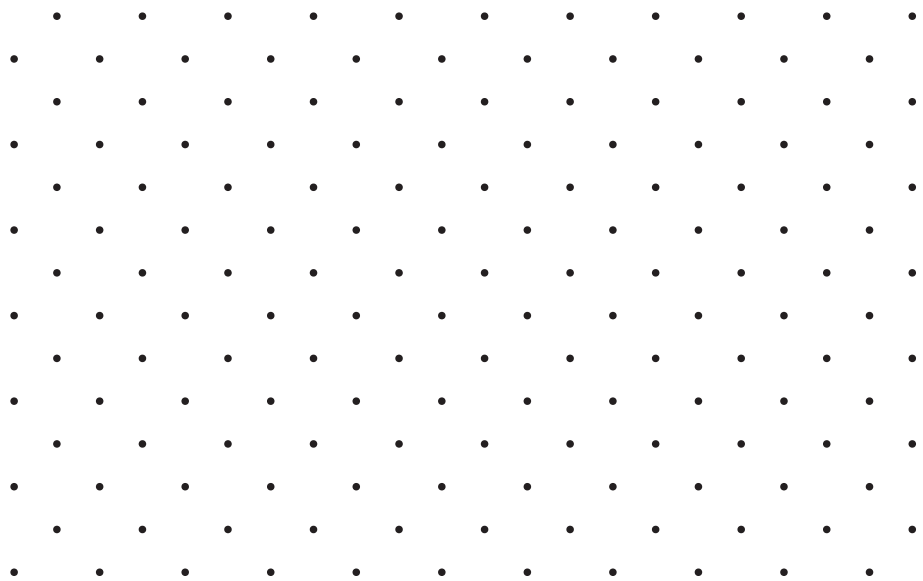
Kath's square



Den's square

(a) Scott has 9 small square tiles.

On the grid below, show how Scott can make a square in the same way with 9 small square tiles.



1 mark

(b) Huw wants to make some more squares with the tiles.

Write 3 other numbers of tiles that he can use to make squares.

Huw can use:

1 tile or 4 tiles or 9 tiles or _____ tiles or _____ tiles or

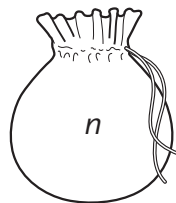
_____ tiles

2 marks

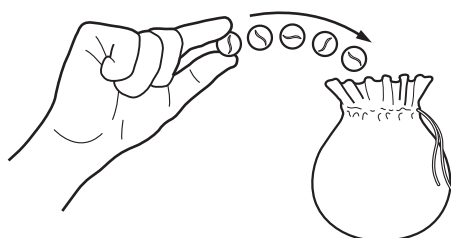
2 Marbles

LEVEL 5

- (a) Elin has a bag of marbles.
You cannot see how many marbles are inside the bag.
Call the number of marbles which Elin starts with in her bag n .



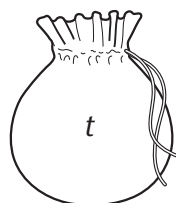
Elin puts 5 more marbles into her bag.



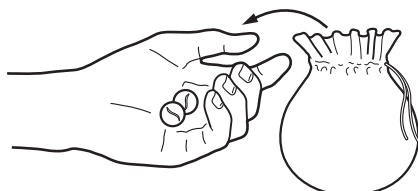
Write an expression to show the total number of marbles in Elin's bag now.

1 mark

- (b) Ravi has another bag of marbles.
Call the number of marbles which Ravi starts with in his bag t .



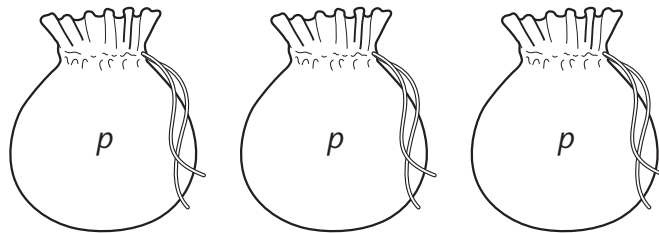
Ravi takes 2 marbles out of his bag.



Write an expression to show the total number of marbles in Ravi's bag now.

1 mark

- (c) Jill has 3 bags of marbles.
Each bag has p marbles inside.



Jill takes some marbles out.

Now the total number of marbles in Jill's 3 bags is $3p - 6$

Some of the statements below could be true.

Put a tick (✓) by each statement that could be true.

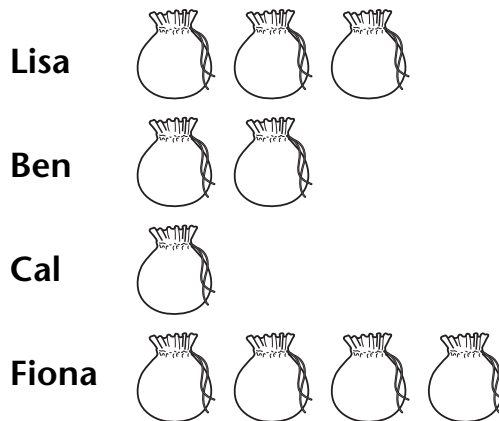
- Jill took 2 marbles out of one of the bags, and none out of the other bags.
- Jill took 2 marbles out of each of the bags.
- Jill took 3 marbles out of one of the bags, and none out of the other bags.
- Jill took 3 marbles out of each of two of the bags, and none out of the other bag.
- Jill took 6 marbles out of one of the bags, and none out of the other bags.
- Jill took 6 marbles out of each of two of the bags, and none out of the other bag.

2 marks

3 Counters

LEVEL 5–6

Four people play a game with counters.
 Each person starts with one or more bags of counters.
 Each bag has m counters in it.



- (a) The table shows what happened during the game.
 Write an expression in the table to show what Cal and Fiona had at the end of the game.
 Write each expression as simply as possible.

	Start	During game	End of game
Lisa	3 bags	lost 5 counters	$3m - 5$
Ben	2 bags	won 3 counters	$2m + 3$
Cal	1 bag	lost 2 counters	
Fiona	4 bags	won 6 counters, and lost 2 counters	

3 marks

- (b) At the end of the game, Lisa and Ben had the same number of counters.
 Write an equation to show this.

1 mark

- (c) Solve the equation to find m , the number of counters in each bag at the start of the game.

$m =$ _____

1 mark

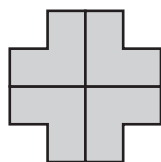
4 Patterns

LEVEL 5

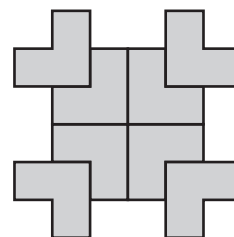
Owen has some tiles like these.



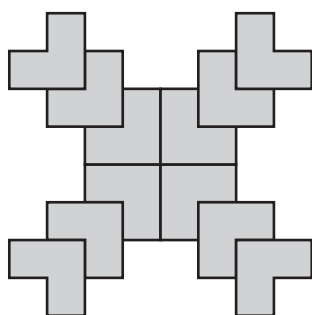
He uses the tiles to make a series of patterns.



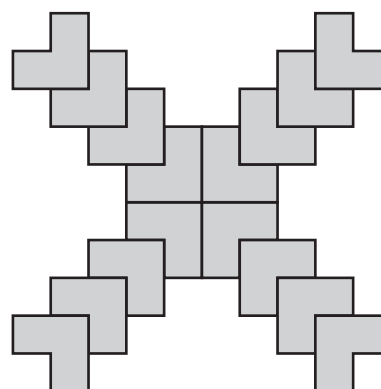
Pattern 1



Pattern 2



Pattern 3



Pattern 4

- (a) Each new pattern has more tiles than the one before.
The number of tiles goes up by the same amount each time.
How many more tiles does Owen add each time he makes a new pattern?

1 mark

- (b) How many tiles will Owen need altogether to make pattern 6?

1 mark

- (c) How many tiles will Owen need altogether to make pattern 9?

1 mark

- (d) Owen uses 40 tiles to make a pattern.
What is the number of the pattern he makes?

1 mark

Algebra: expressions

1 Trees

LEVEL 5

Jo is planting a small orchard.

She plants cherry trees, plum trees, apple trees and pear trees.

n stands for the number of cherry trees Jo plants.

- (a) Jo plants the same number of plum trees as cherry trees.
How many plum trees does she plant?

1 mark

- (b) Jo plants twice as many apple trees as cherry trees.
How many apple trees does she plant?

1 mark

- (c) Jo plants 7 more pear trees than cherry trees.
How many pear trees does she plant?

1 mark

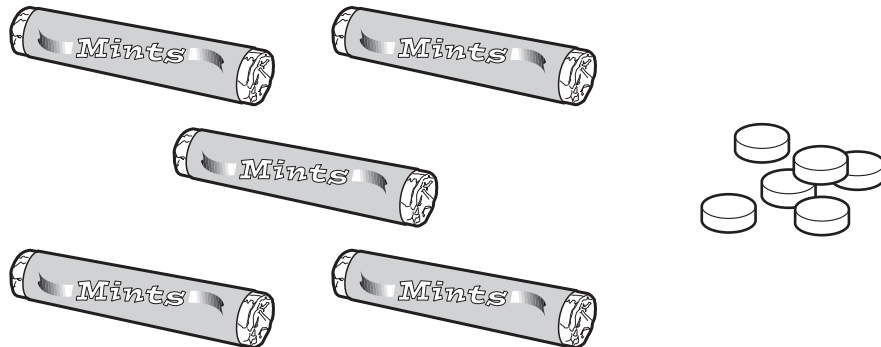
- (d) How many trees does Jo plant altogether?
Write your answer as simply as possible.

2 marks

2 Mints

LEVEL 5

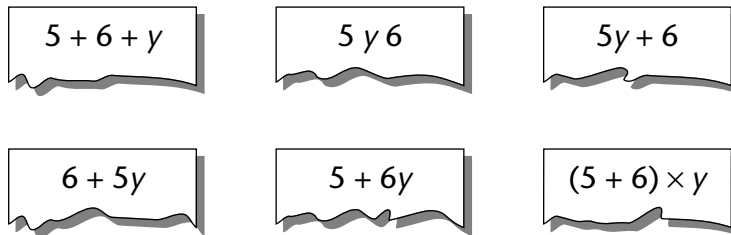
A teacher has 5 full packets of mints and 6 single mints.
The number of mints inside each packet is the same.



The teacher tells the class:

'Write an expression to show how many mints there are altogether.
Call the number of mints inside each packet y .'

Here are some of the expressions that the pupils write.



(a) Write down two expressions that are correct.

_____ and _____

2 marks

(b) A pupil says: 'I think the teacher has a total of 56 mints.'
Could the pupil be correct? Tick (✓) Yes or No.

Yes No

Explain how you know.

1 mark

3 Bags

LEVEL 5

Ali, Barry and Cindy each have a bag of counters.
They do not know how many counters are in each bag.

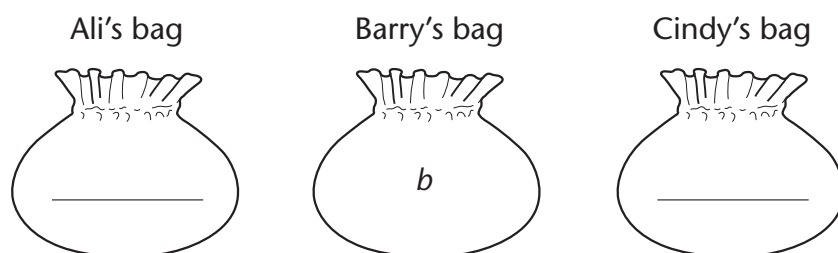
They know that: Barry has two more counters than Ali.
Cindy has four times as many counters as Ali.

- (a) Ali calls the number of counters in her bag a .
Write expressions using a to show the number of counters in Barry's bag and in Cindy's bag.



1 mark

- (b) Barry calls the number of counters in his bag b .
Write expressions using b to show the number of counters in Ali's bag and in Cindy's bag.



2 marks

- (c) Cindy calls the number of counters in her bag c .



Which of the expressions below shows the number of counters in Barry's bag? Circle the correct one.

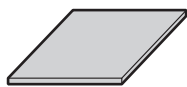
$4c + 2$	$4c - 2$	$\frac{c}{4} + 2$
$\frac{c}{4} - 2$	$\frac{c + 2}{4}$	$\frac{c - 2}{4}$

1 mark

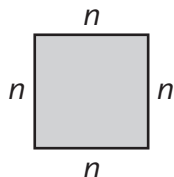
4 T-shape

LEVEL 5–6

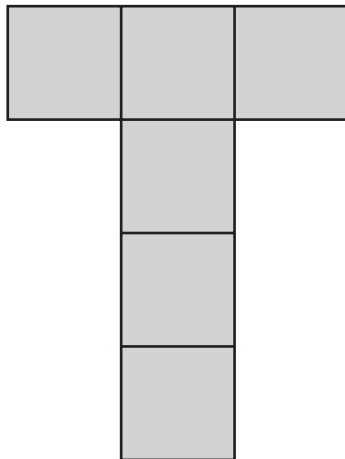
This is a square tile.



The edge of the tile is n centimetres long.



The perimeter of the tile is $4n$ centimetres.



This T-shape is made with 6 square tiles.

- (a) Write an expression for the perimeter of the T-shape.
The expression should be a number multiplied by n .

1 mark

- (b) The perimeter of the T-shape is 28 centimetres.
Use your expression from part (a) to write an equation involving n .

1 mark

Solve your equation to find the value of n .

$n =$ _____

1 mark

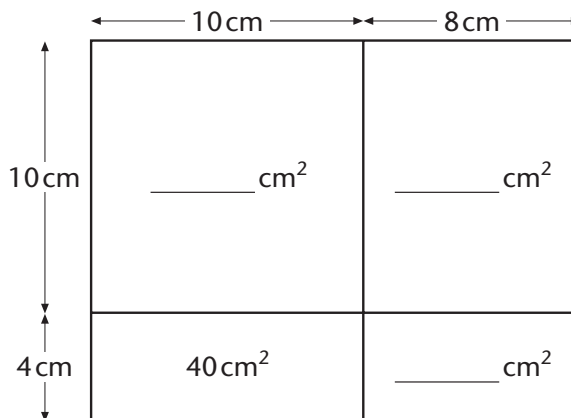
Shape and space: area and perimeter

1 Areas

LEVEL 5

- (a) The diagram shows a rectangle 18 cm long and 14 cm wide. It has been split into four smaller rectangles.

Write the area of each small rectangle on the diagram. One has been done for you.



2 marks

What is the area of the whole rectangle?

_____ cm²

1 mark

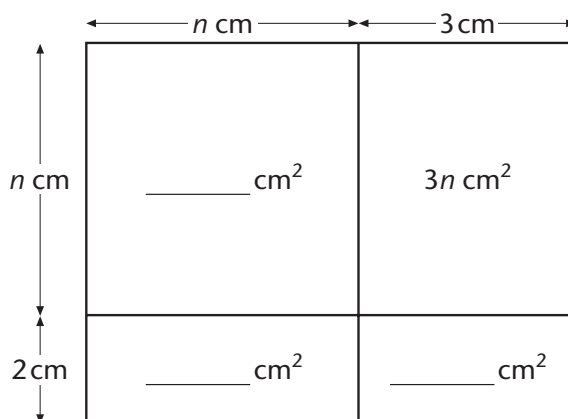
What is 18×14 ?

$18 \times 14 =$ _____

1 mark

- (b) The diagram shows a rectangle $(n + 3)$ cm long and $(n + 2)$ cm wide. It has been split into four smaller rectangles.

Write a number or an expression for the area of each small rectangle on the diagram. One has been done for you.

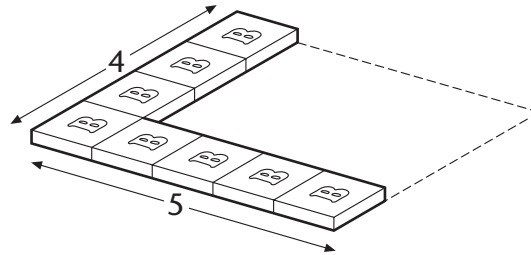


1 mark

2 Packs

LEVEL 4-5

- (a) Carl is putting packs of biscuits into a box. He puts in the bottom layer. The box holds 5 packs across and is 4 packs wide.

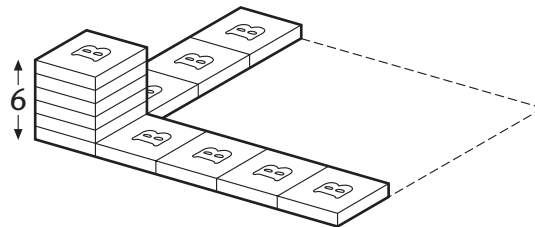


How many packs will fit altogether on the bottom layer?

_____ packs

1 mark

The box holds 6 layers.

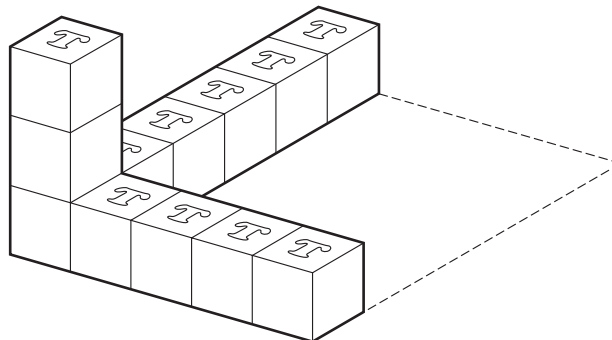


How many packs will fit in the box when it is full?

_____ packs

1 mark

- (b) Aziz is putting packs of tea into a box. The box holds 5 packs across and is 6 packs wide. The box holds 3 layers.



How many packs of tea will fit in the box when it is full?

_____ packs

1 mark

- (c) Fill in the gaps below to show one way of filling a different box with 24 packs in 2 layers.

Total: 24 packs and 2 layers

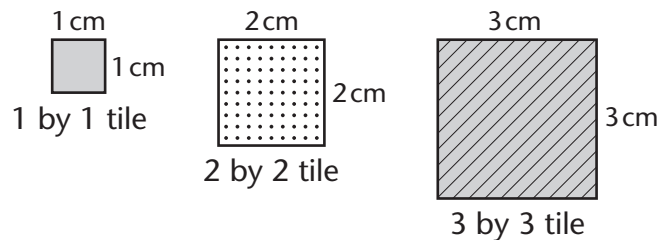
_____ packs across _____ packs wide

1 mark

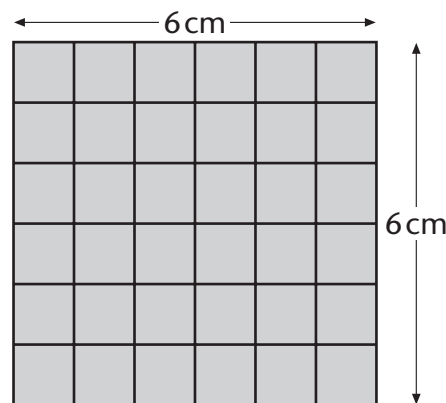
3 Squares

LEVEL 4–5

Alika has a box of square tiles. The tiles are three different sizes.



She also has a mat that is 6 cm by 6 cm.
36 of the 1 by 1 tiles will cover the mat.



(a) How many of the 2 by 2 tiles will cover the mat?

_____ 2 by 2 tiles

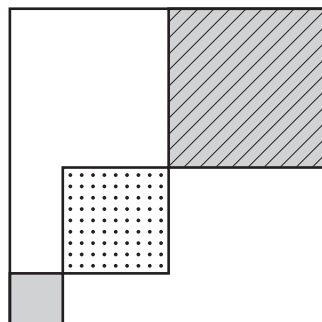
1 mark

(b) How many of the 3 by 3 tiles will cover the mat?

_____ 3 by 3 tiles

1 mark

(c) Alika glues three tiles on her mat like this.



Complete the gaps below.

Alika could cover the rest of the mat by using another

two 3 by 3 tiles and another _____ 1 by 1 tiles.

1 mark

Or she could cover the rest of the mat by using another

two 2 by 2 tiles and another _____ 1 by 1 tiles.

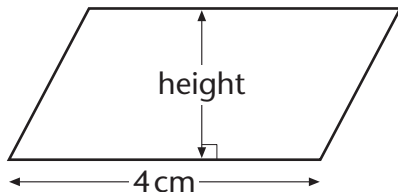
1 mark

4 Area

LEVEL 5-6

Each shape in this question has an area of 10 cm^2 .
No diagram is drawn to scale.

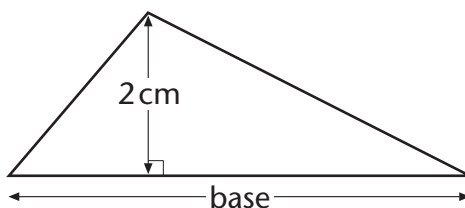
(a) Calculate the height of the parallelogram.



area = 10 cm^2 height = _____ cm

1 mark

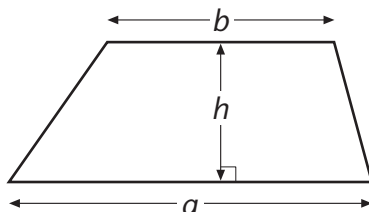
(b) Calculate the length of the base of the triangle.



area = 10 cm^2 base = _____ cm

1 mark

(c) What might be the values of h , a and b in this trapezium?
(a is greater than b .)



area = 10 cm^2 h = _____ cm

a = _____ cm b = _____ cm

1 mark

What else might the values of h , a and b be?

area = 10 cm^2 h = _____ cm

a = _____ cm b = _____ cm

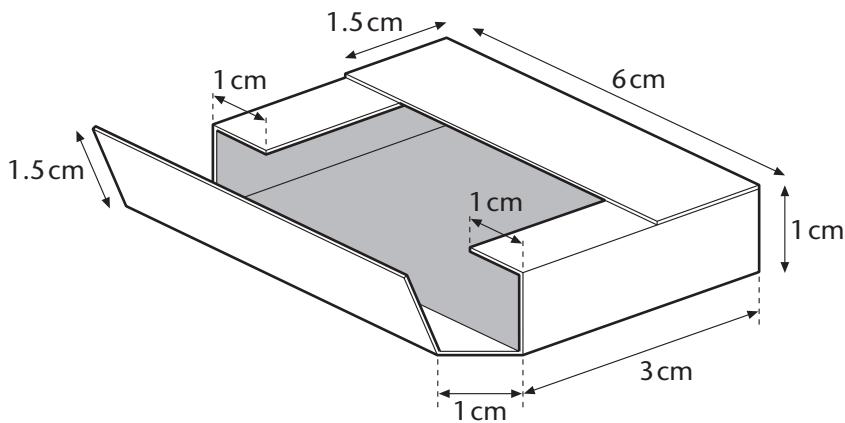
1 mark

Shape and space: 2-D to 3-D

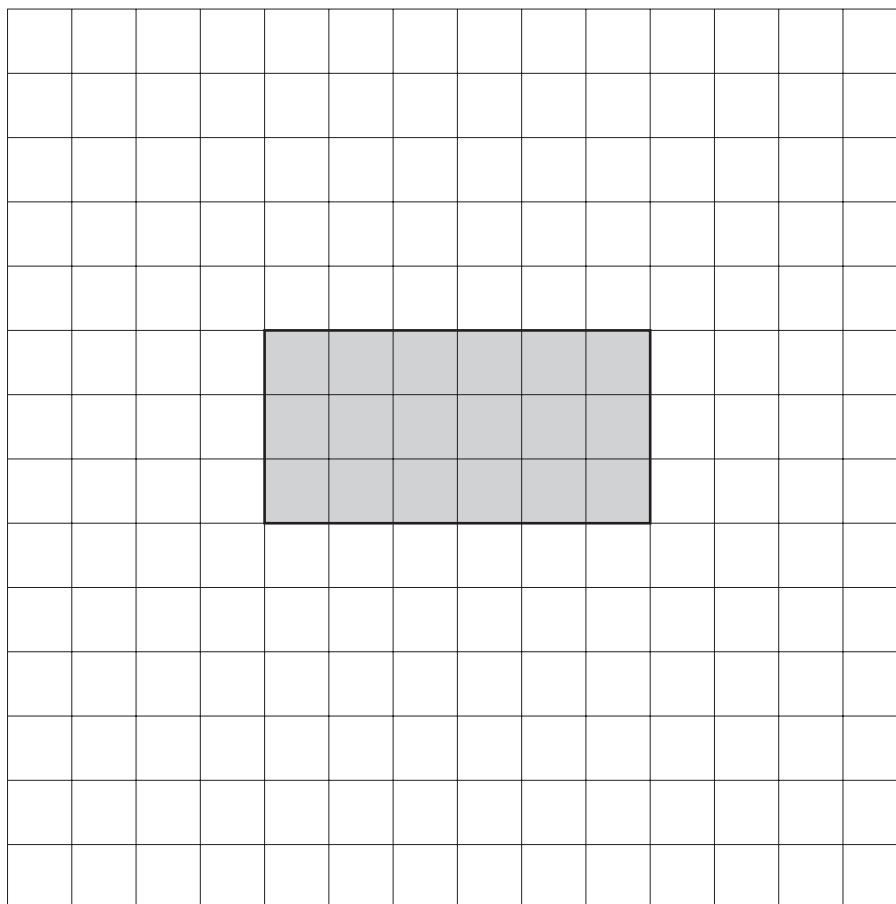
1 Box

LEVEL 4-5

The diagram shows a box.



Complete the net for the box.

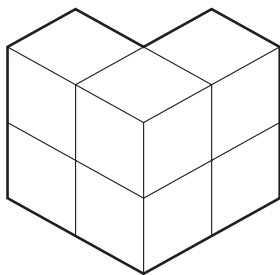


3 marks

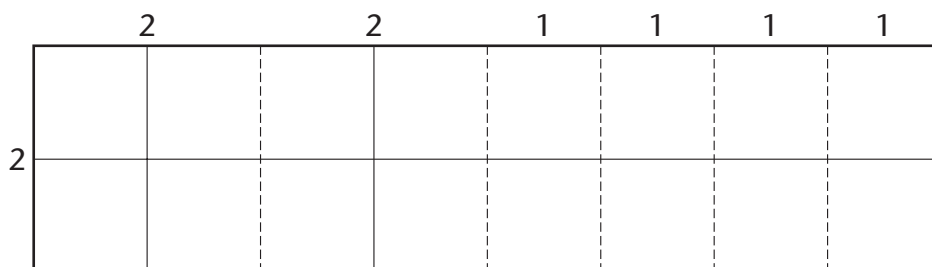
2 Prisms

LEVEL 5

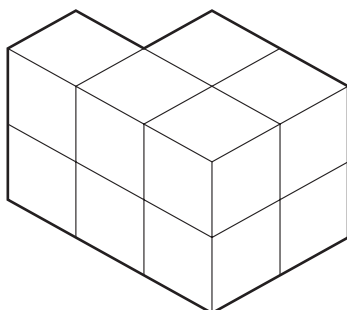
This prism is made from six cubes.



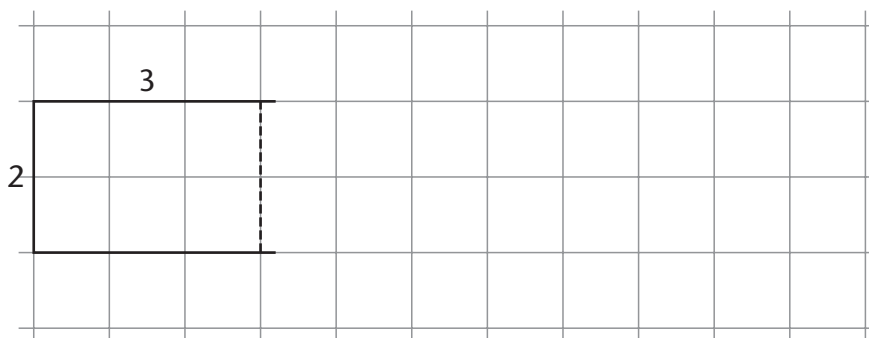
The piece of paper below fits exactly around the sides of the prism. The dashed lines are fold lines.



A different prism is made from ten cubes.



Complete the diagram to show a piece of paper that fits exactly around the sides of the ten-cube prism. Show all folds as dashed lines.

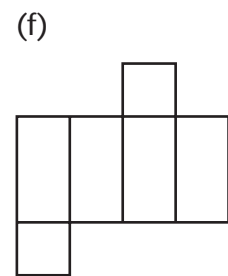
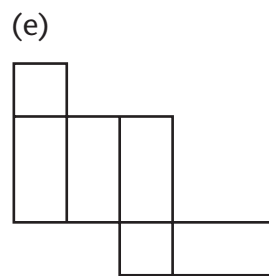
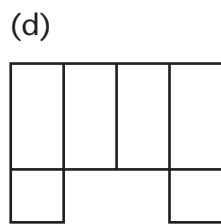
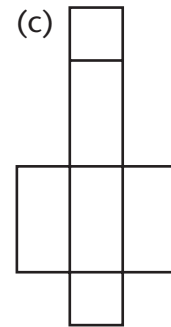
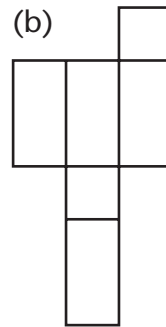
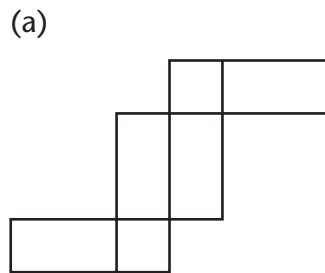


2 marks

3 Two nets

LEVEL 5

Some of these nets can be folded to make cuboids.



(a) Tick (✓) the nets that can be folded to make cuboids.

2 marks

(b) Choose two nets which cannot be folded to make cuboids.

Explain why one of the nets cannot be folded to make a cuboid.
You can write your explanation or show it on a diagram.
Say which net you have chosen.

1 mark

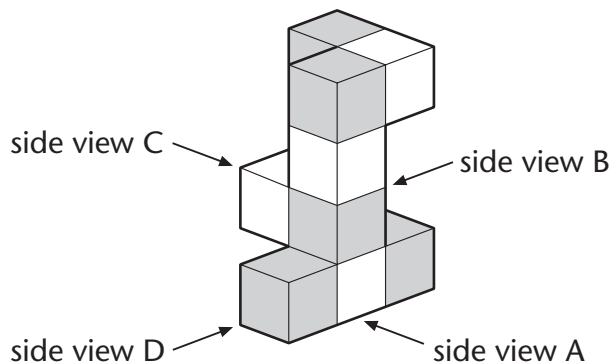
(c) Explain why the other net cannot be folded to make a cuboid.
You can write your explanation or show it on a diagram.
Say which net you have chosen.

1 mark

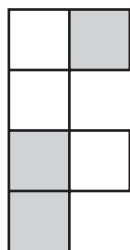
4 Views

LEVEL 5-6

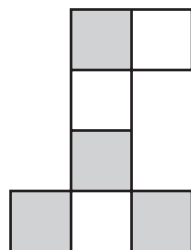
The diagram shows a model made with nine cubes. Five of the cubes are grey. The other four cubes are white.



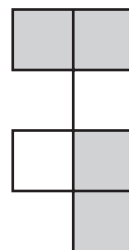
(a) The drawings below show the four side views of the model. Which side view does each drawing show?



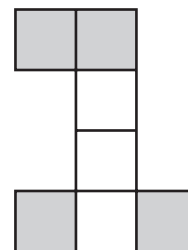
side view ____



side view ____



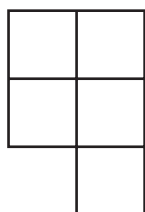
side view ____



side view ____

1 mark

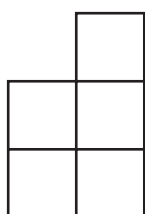
(b) Complete the top view of the model by shading the squares that are grey.



top view

1 mark

(c) Imagine you turn the model upside down. What will the new top view of the model look like? Shade the grey squares.



new top view

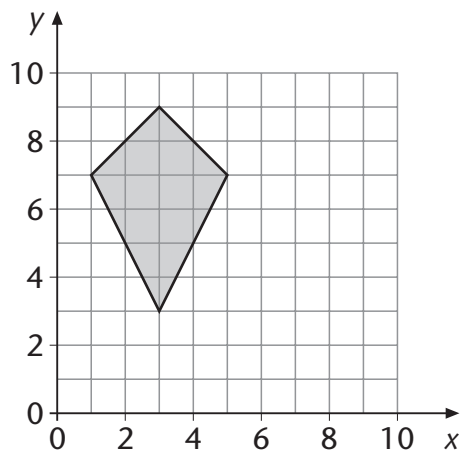
1 mark

Shape and space: shapes and angles

1 Shapes

LEVEL 4

Look at the shaded shape.

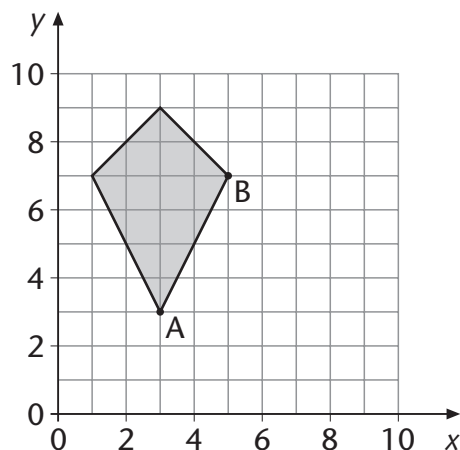


(a) Two statements below are correct. Tick (✓) the correct statements.

- The shape is a quadrilateral.
- The shape is a trapezium.
- The shape is a pentagon.
- The shape is a kite.
- The shape is a parallelogram.

1 mark

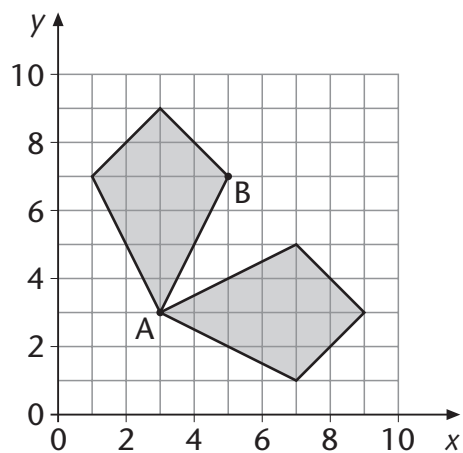
(b) What are the coordinates of point B?



(,)

1 mark

- (c) The shape is reflected in a mirror line.
Point A stays in the same place.
Where is point B reflected to?
Put a cross on the grid to show the correct place.



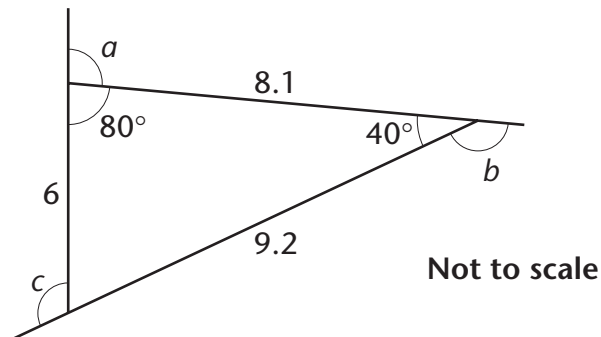
1 mark

2 Angles

LEVEL 5–6

Kay is drawing shapes on her computer.

(a) She wants to draw this triangle. She needs to know angles a , b and c .



Calculate angles a , b and c .

$a = \text{_____}^\circ$

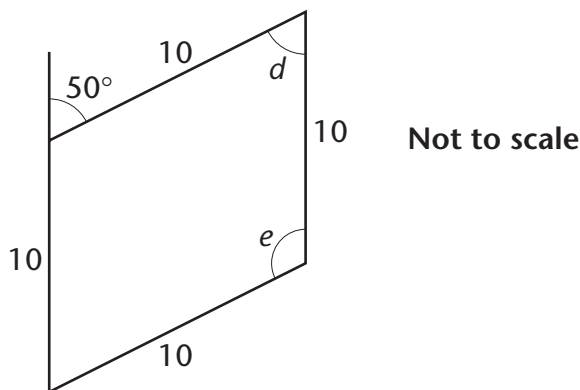
1 mark

$b = \text{_____}^\circ$

$c = \text{_____}^\circ$

1 mark

(b) Kay draws a rhombus.



Calculate angles d and e .

$d = \text{_____}^\circ$

1 mark

$e = \text{_____}^\circ$

1 mark

(c) Kay types the instructions to draw a regular pentagon.

repeat 5 [forward 10, left turn 72]

Complete the instructions to draw a regular hexagon.

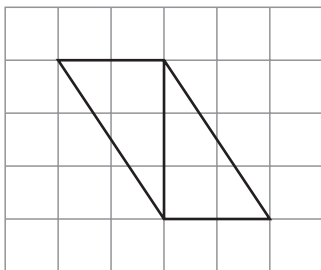
repeat 6 [forward 10, left turn _____]

1 mark

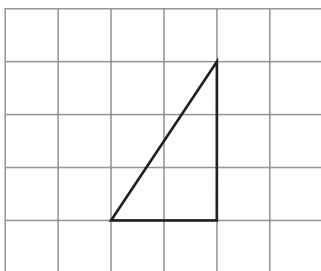
3 Triangle

LEVEL 4–5

These two congruent triangles make a parallelogram.

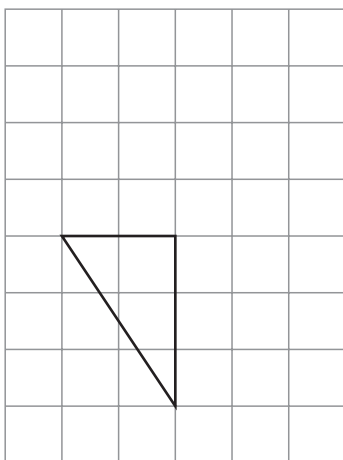


(a) Draw another congruent triangle to make a rectangle.



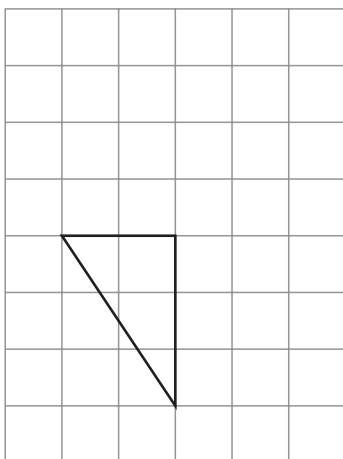
1 mark

(b) Draw another congruent triangle to make a bigger triangle.



1 mark

(c) Draw another congruent triangle to make a different bigger triangle.

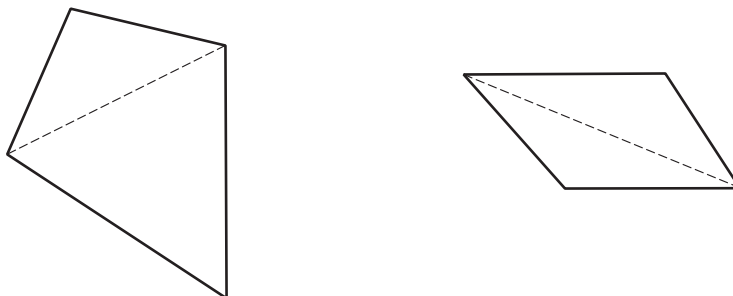


1 mark

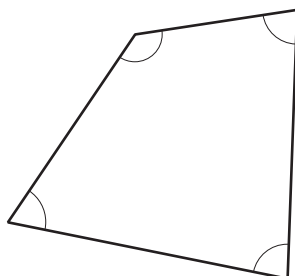
4 Polygons

LEVEL 5

(a) Any quadrilateral can be split into two triangles.

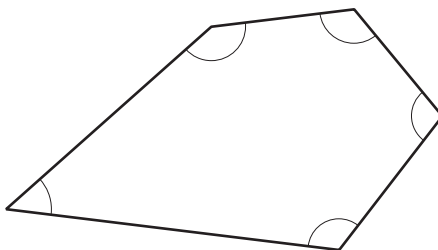


Explain how you know that the angles inside a quadrilateral add up to 360°



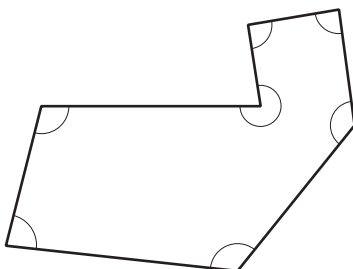
_____ 1 mark

(b) What do the angles inside a pentagon add up to?



_____° 1 mark

(c) What do the angles inside a heptagon (seven-sided shape) add up to? Show your working.



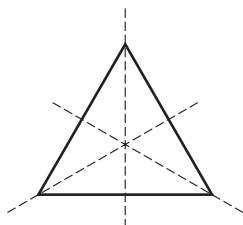
_____° 2 marks

Shape and space: transformations

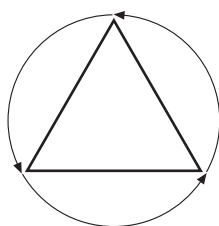
1 Symmetry

LEVEL 5

An equilateral triangle has 3 lines of symmetry.

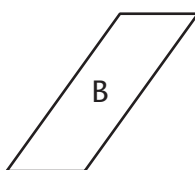
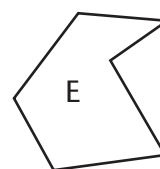
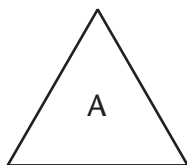


It has rotation symmetry of order 3.



Write the letter of each shape in the correct space in the table below. The letters for the first two shapes have been written for you.

You may use a mirror or tracing paper to help you.



Number of lines of symmetry

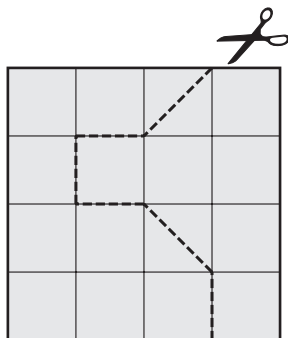
	0	1	2	3
1				
2	B			
3				A

4 marks

2 Pieces

LEVEL 5

(a) I have a square piece of card.



I cut along the dashed line to make two pieces of card.

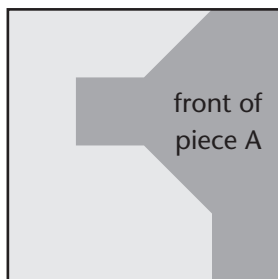
Do the two pieces of card have the same area? Tick (✓) Yes or No.

Yes No

Explain your answer.

1 mark

(b) The card is shaded grey on the front, and black on the back.



I turn piece A over to see its black side.

Which of the shapes below shows the black side of piece A?

Put a tick (✓) under the correct answer.

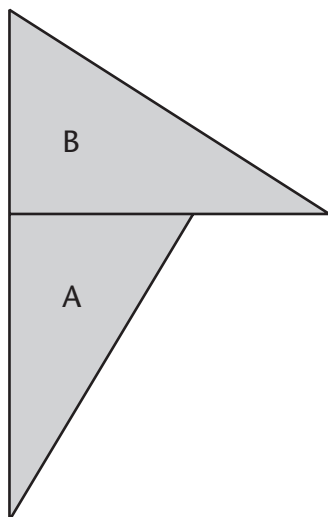


1 mark

3 Transformations

LEVEL 5

- (a) You can rotate triangle A onto triangle B.
Put a cross on the centre of rotation.
You may use tracing paper to help you.



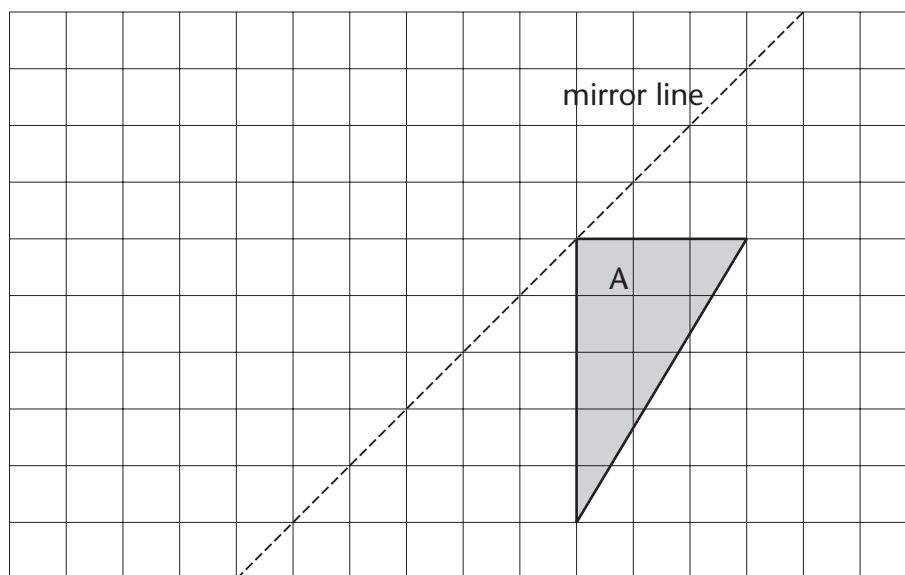
1 mark

- (b) You can rotate triangle A onto triangle B.
The rotation is anti-clockwise.
What is the angle of rotation?

Angle _____°

1 mark

- (c) Reflect triangle A in the mirror line.
You may use a mirror or tracing paper to help you.

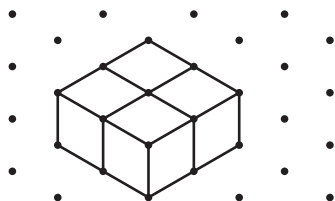


1 mark

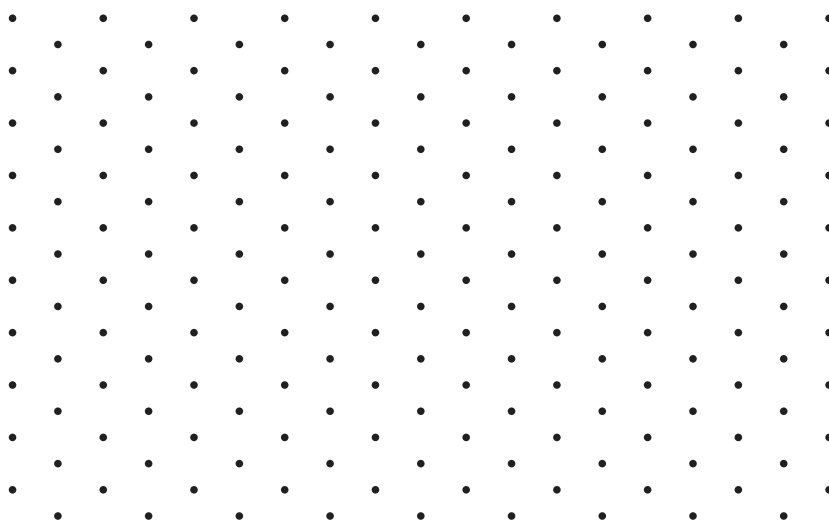
4 Enlargements

LEVEL 5

This cuboid is made from four small cubes.



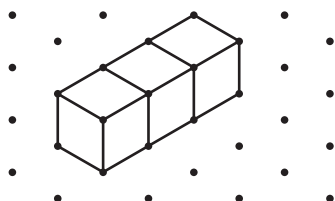
(a) Draw a cuboid which is twice as high, twice as long and twice as wide.



2 marks

(b) Graham made this cuboid from three small cubes.

Mohinder wants to make a cuboid which is twice as high, twice as long and twice as wide as Graham's cuboid.



How many small cubes will Mohinder need altogether?

1 mark

Handling data: interpreting data

1 Shoes

LEVEL 4

(a) Lisa works in a shoe shop.

She recorded the size of each pair of trainers that she sold during a week.

This is what she wrote down.

	Sizes of trainers sold						
Monday	7	7	5	6			
Tuesday	6	4	4	8			
Wednesday	5	8	6	7	5		
Thursday	7	4	5				
Friday	7	4	9	5	7	8	
Saturday	6	5	7	6	9	4	7

Use a tallying method to make a table showing how many pairs of trainers of each size were sold during the whole week.

3 marks

(b) Which size of trainer did Lisa sell the most of?

size _____

1 mark

(c) Lisa said: 'Most of the trainers sold were bigger than size 6.'

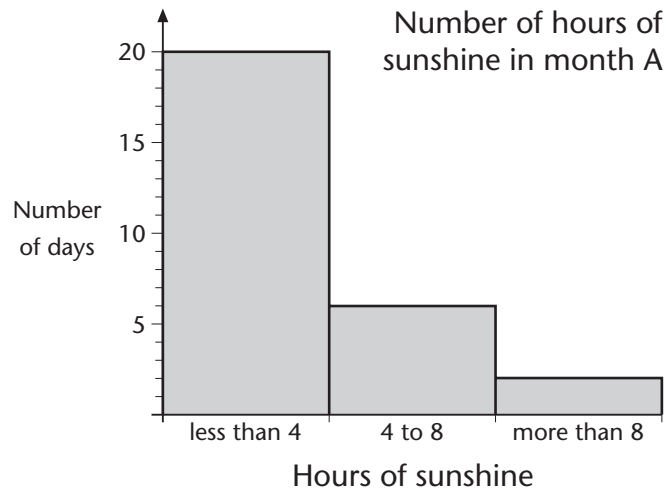
How can you tell from your table that Lisa is wrong?

1 mark

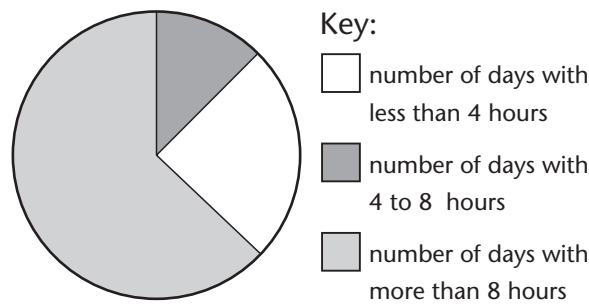
2 Sunshine

LEVEL 4

The diagrams show the number of hours of sunshine in two different months.



Number of hours of sunshine in month B



(a) How many days are there in month A? Tick (✓) the correct box.

28 29 30 31 not possible to tell

1 mark

(b) How many days are there in month B? Tick (✓) the correct box.

28 29 30 31 not possible to tell

1 mark

(c) Which month had more hours of sunshine?

month A month B

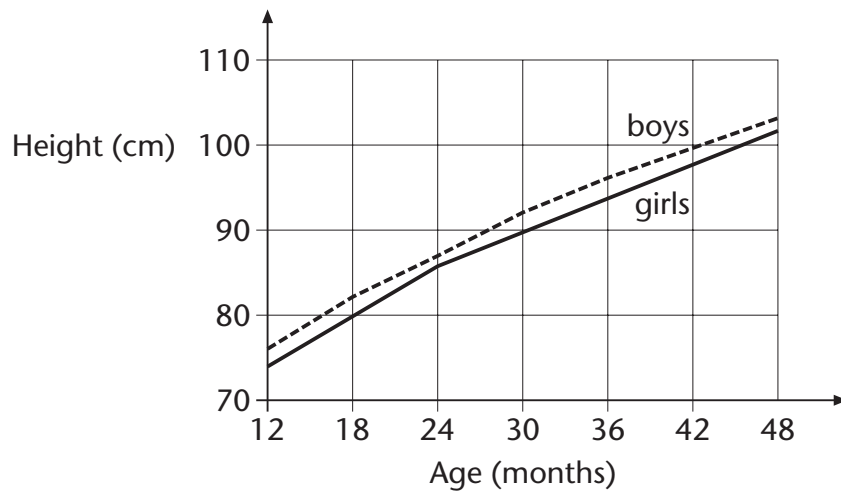
Explain how you know.

1 mark

3 Height

LEVEL 5

The graph shows the average heights of young children.



(a) What is the average height of girls aged 30 months?

1 mark

(b) What is the average height of boys aged 36 months?

_____ cm

1 mark

(c) Jane is average height for her age. Her height is 80 cm. Use the graph to find Jane's age.

_____ months

1 mark

(d) The table shows approximately how much an average girl grows each year between the ages of 12 and 48 months. Use the graph to complete the table.

Age (months)	Approximate height at start (cm)	Approximate height at end (cm)	Approximate growth (cm)
12 to 24	74	86	12
24 to 36	86		
36 to 48			

2 marks

(e) This formula tells you how tall a boy is likely to be when he grows up.

Add the mother's and father's heights.
Divide by 2. Add 7 cm to the result.

The boy is likely to be this height, plus or minus 10 cm.

Marc's mother is 168 cm tall. His father is 194 cm tall.

What is the greatest height Marc is likely to be when he grows up?
Show your working.

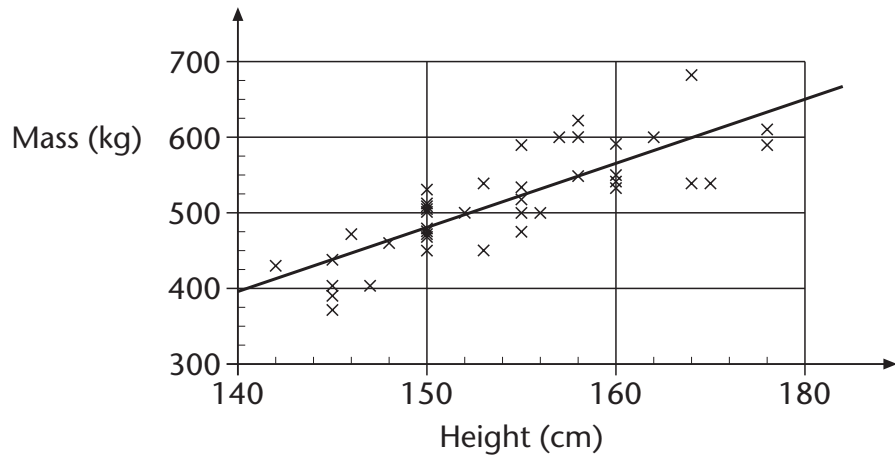
_____ cm

2 marks

4 Horses

LEVEL 6

The scatter diagram shows the heights and masses of some horses. The scatter diagram also shows a line of best fit.



- (a) What does the scatter diagram show about the relationship between the height and mass of horses?

_____ 1 mark

- (b) The height of a horse is 163 cm. Use the line of best fit to estimate the mass of the horse.

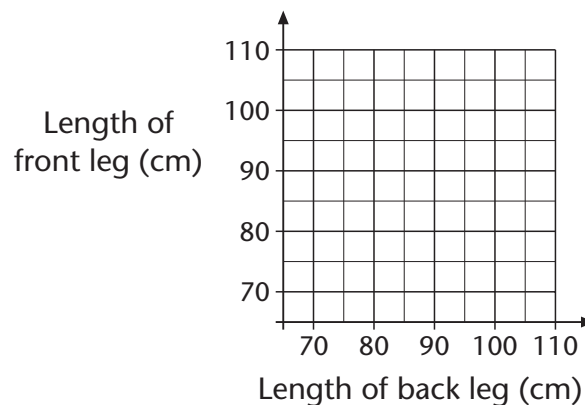
_____ kg 1 mark

- (c) A different horse has a mass of 625 kg. Use the line of best fit to estimate its height.

_____ cm 1 mark

- (d) A teacher asks his class to investigate this statement: 'The length of the back leg of a horse is always less than the length of the front leg of a horse. What might a scatter graph look like if the statement is correct?'

Use the axes below to show your answer.



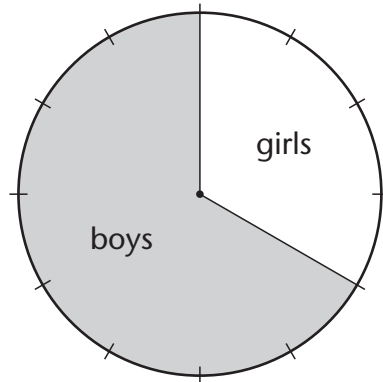
1 mark

Handling data: pie charts

1 Playgroup

LEVEL 4

There are 48 children altogether in a playgroup.



(a) How many of the children are girls?

1 mark

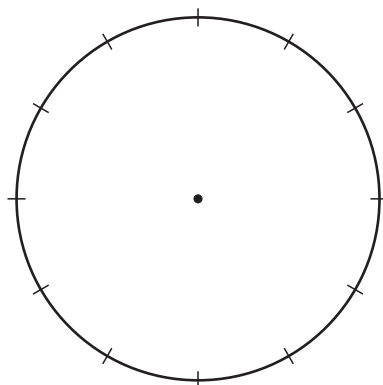
What percentage of the children are girls?

_____ %

1 mark

(b) 24 of the children are 4 years old.
20 of the children are 3 years old.
4 of the children are 2 years old.

Show this information on the diagram below.
Label each part clearly.

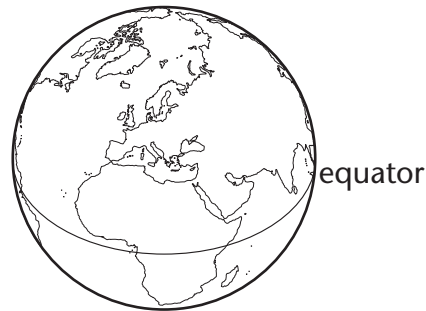


3 marks

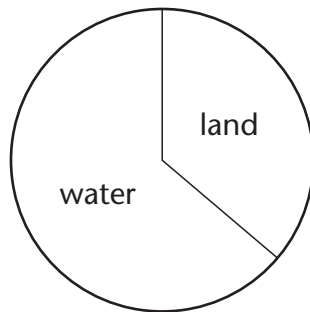
2 Land and water

LEVEL 4

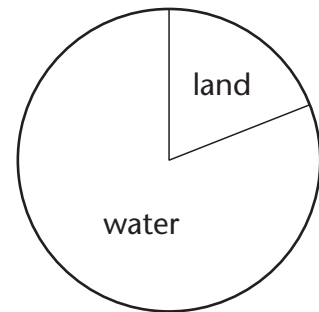
These pie charts show the area of the Earth’s surface covered by water and land north and south of the equator.



North of the equator



South of the equator



(a) About what percentage of the Earth’s surface north of the equator is covered by land?

_____ %

1 mark

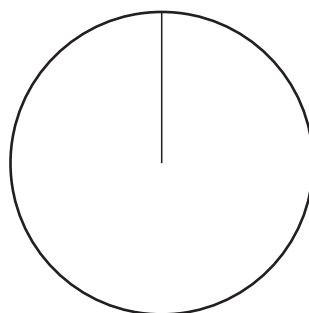
(b) About what percentage of the Earth’s surface south of the equator is covered by land?

_____ %

1 mark

(c) Sketch a pie chart to show the area of the whole Earth’s surface covered by water and by land. Label the parts of your pie chart ‘water’ and ‘land’.

Whole Earth



2 marks

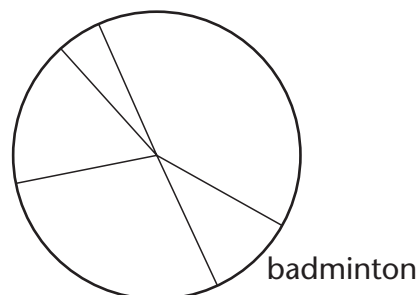
3 Sport

LEVEL 4-5

(a) At a sports centre, people take part in one of five different sports.

This table shows the percentages of people who played badminton, football and squash on Friday.

Friday	
Badminton	10%
Football	40%
Squash	5%
Swimming	?
Tennis	?



Label the correct two sections of the pie chart 'football' and 'squash'. 'Badminton' has been labelled for you. 1 mark

(b) On Friday more people went swimming than played tennis. Use the chart to estimate the percentage of people who went swimming.

_____ % 1 mark

Use the chart to estimate the percentage of people who played tennis. Make sure you have accounted for all the people.

_____ % 2 marks

(c) Altogether 260 people played the different sports on Friday.

Complete this table to show how many people played badminton, football and squash on Friday. 2 marks

Sport	Percentage	Number of people
Badminton	10%	26
Football	40%	_____
Squash	5%	_____

(d) Altogether 260 people played the different sports on Friday and 700 people played the different sports on Saturday.

40% of the people played football on Friday, but only 20% of the people played football on Saturday.

Mike said: '40% is more than 20%, so more people played football on Friday.'

Mike is wrong. Explain why.

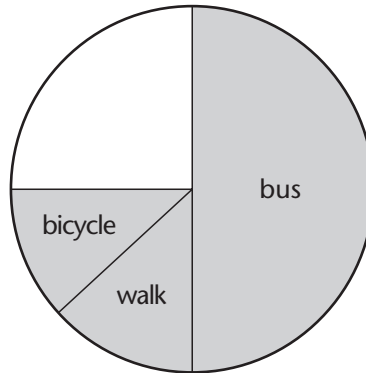
_____ 1 mark

4 Travel

LEVEL 5

There are 24 pupils in Jim’s class.
He did a survey of how the pupils in his class travelled to school.
He started to draw a pie chart to show his results.

Jim’s class (24 pupils)



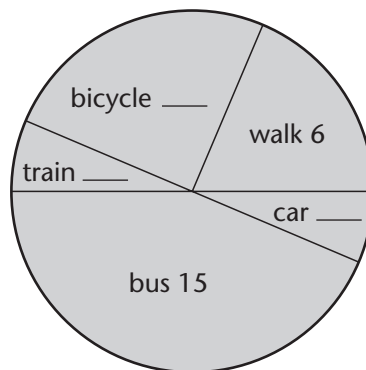
- (a) 4 pupils travelled to school by train.
Show this on Jim’s pie chart as accurately as you can.
Label this part ‘train’. Label the remaining part ‘car’.

1 mark

- (b) There are 36 pupils in Sara’s class.
She did the same survey and drew a pie chart to show her results.
15 pupils travelled by bus and 6 pupils walked.

On Sara’s pie chart write how many pupils travelled to school by train, car and bicycle.

Sara’s class (36 pupils)



2 marks

- (c) Jim says:
‘15 pupils in Sara’s class travelled by bus.
Only 12 pupils in my class travelled by bus.
Sara’s pie chart shows fewer people travelling by bus than mine does.
So Sara’s chart must be wrong.’

Explain why Jim is wrong.

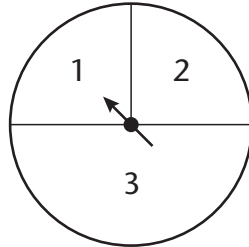
1 mark

Handling data: probability

1 In the spin

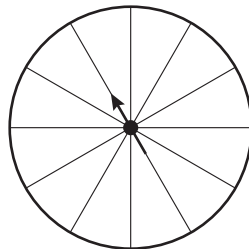
LEVEL 5

- (a) What is the probability of getting a 3 on this spinner?



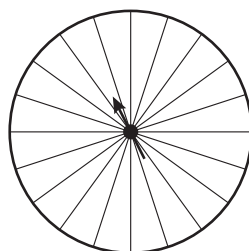
1 mark

- (b) Shade this spinner so that the chance of getting a shaded section is double the chance of getting a white section.



1 mark

- (c) Shade this spinner so that there is a 40% chance of getting a shaded section.

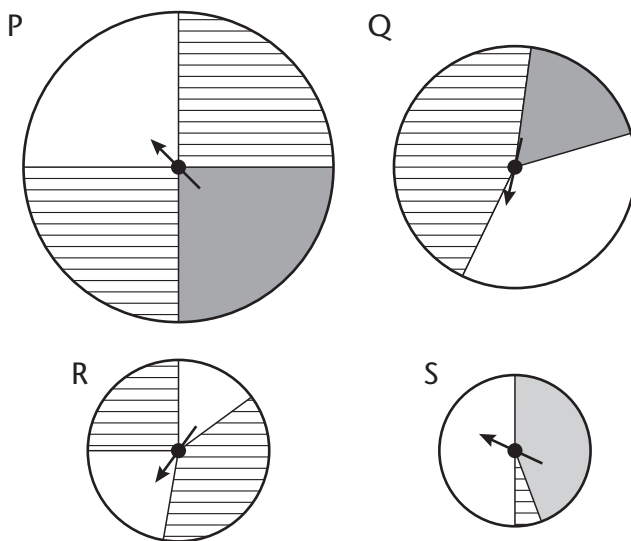


1 mark

2 Spinners

LEVEL 4

Here are four spinners, labelled P, Q, R and S.



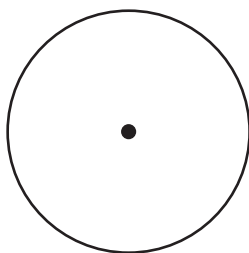
(a) Which spinner gives the greatest chance that the arrow will land on **plain**?

Spinner _____ 1 mark

(b) Which spinner gives the smallest chance that the arrow will land on **shaded**?

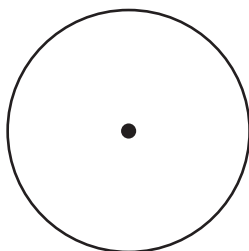
Spinner _____ 1 mark

(c) Shade this spinner so that it is certain that the arrow will land on **shaded**.



1 mark

(d) Shade this spinner so that there is a 50% chance that the arrow will land on **shaded**.



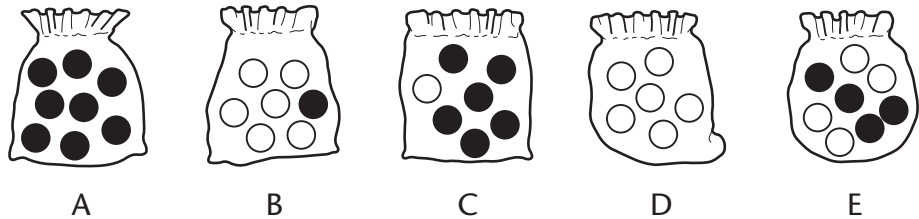
1 mark

3 Beads

LEVEL 4

Bryn has some bags with some black beads and some white beads. He is going to take a bead from each bag without looking.

(a) Match the pictures to the statements. The first is done for you.



It is impossible that Bryn will take a black bead from bag D

It is unlikely that Bryn will take a black bead from bag _____

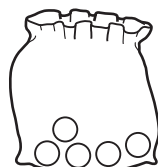
It is equally likely that Bryn will take a black bead or a white bead from bag _____

It is likely that Bryn will take a black bead from bag _____

It is certain that Bryn will take a black bead from bag _____

3 marks

(b) Bryn has 5 white beads in a bag.



He wants to make it more likely that he will take a black bead than a white bead out of the bag.

How many black beads should Bryn put into the bag?

_____ black beads 1 mark

(c) There are 20 beads altogether in another bag. All the beads are either black or white.

It is equally likely that Bryn will take a black bead or a white bead from the bag.

How many black beads and how many white beads are there in the bag?

_____ black beads and _____ white beads 2 marks

4 Crisps

LEVEL 5

Mark and Kate each buy a family pack of crisps.

Each family pack contains 10 bags of crisps.

The table shows how many bags of each flavour are in each family pack.

Flavour	Number of bags
plain	5
vinegar	2
chicken	2
cheese	1

- (a) Mark is going to take a bag of crisps at random from his family pack. Complete these sentences.

The probability that the flavour will be

_____ is $\frac{1}{2}$. 1 mark

The probability that the flavour will be cheese is _____. 1 mark

- (b) Kate ate two bags of plain crisps from her family pack of 10 bags. Now she is going to take a bag at random from the bags that are left.

What is the probability that the flavour will be cheese?

_____ 1 mark

- (c) A shop sells 12 bags of crisps in a large pack. I am going to take a bag at random from this large pack. The table below shows the probability of getting each flavour.

Use the probabilities to work out how many bags of each flavour are in this large pack.

Flavour	Probability	Number of bags
plain	$\frac{7}{12}$	
vinegar	$\frac{1}{4}$	
chicken	$\frac{1}{6}$	
cheese	0	

2 marks

5 Canteen

LEVEL 5

A school has a new canteen.

A special person will be chosen to perform the opening ceremony.

The names of all the pupils, all the teachers and all the canteen staff are put into a box. One name is taken out at random.

A pupil says:

'There are only three choices.

It could be a pupil, a teacher or one of the canteen staff.

The probability of it being a pupil is $\frac{1}{3}$.'

The pupil is wrong. Explain why.

1 mark