Ma

KEY STAGE 3

TIERS 4–6

2006

Mathematics test

Paper 2

Calculator allowed

Please read this page, but do not open your booklet until your teacher tells you to start. Write your name and the name of your school in the spaces below.

First name _____

Last name _____

School _____

Remember

- The test is 1 hour long.
- You may use a calculator for any question in this test.
- You will need: pen, pencil, rubber, ruler, tracing paper and mirror (optional) and a calculator.
- Some formulae you might need are on page 2.
- This test starts with easier questions.
- Try to answer all the questions.
- Write all your answers and working on the test paper – do not use any rough paper. Marks may be awarded for working.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marker's use only		
	Total marks	
	Borderline check	

QCA/06/1927

Instructions

Answers

This means write down your answer or show your working and write down your answer.

Calculators

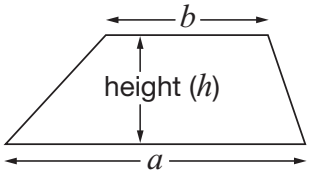
You **may** use a calculator to answer any question in this test.

Formulae

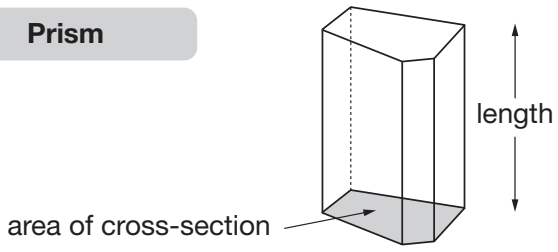
You might need to use these formulae

Trapezium

Area = $\frac{1}{2}(a + b)h$

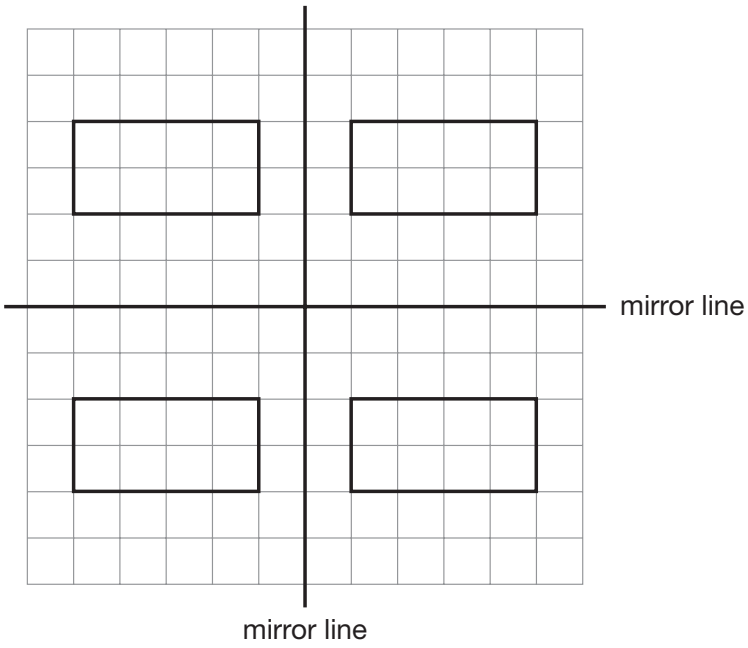


Prism

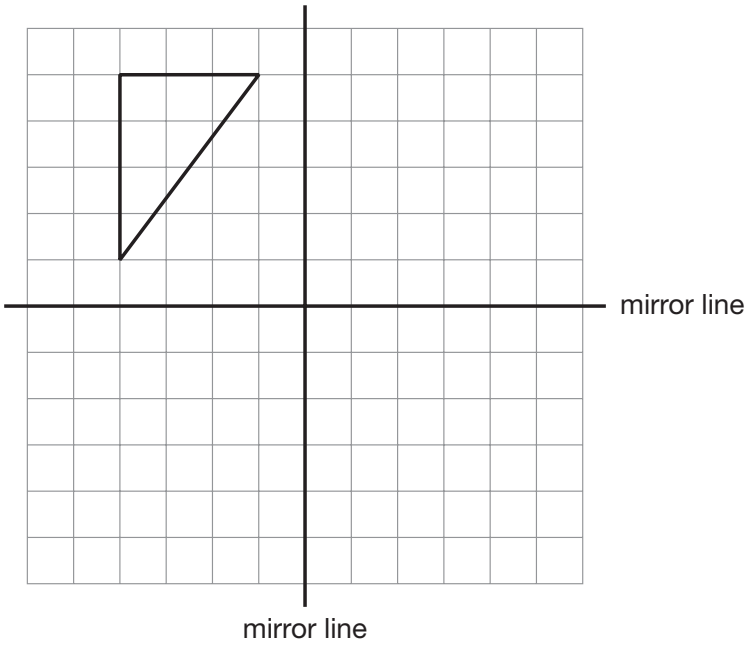


Volume = area of cross-section × length

1. The square grid shows a rectangle reflected in **two mirror lines**.



On the square grid below, show the **triangle** reflected in the two mirror lines.



2 marks

2. (a) These rules show how to get from one number to the next in these sequences.

Use the rules to write the next **two** numbers in each sequence.

Rule: **Add 8**				
	4	12	_____	_____

1 mark

Rule: **Multiply by 3**				
	4	12	_____	_____

1 mark

Rule: **Divide by 4 then add 11**				
	4	12	_____	_____

1 mark

(b) A sequence of numbers starts like this:

30 22 18

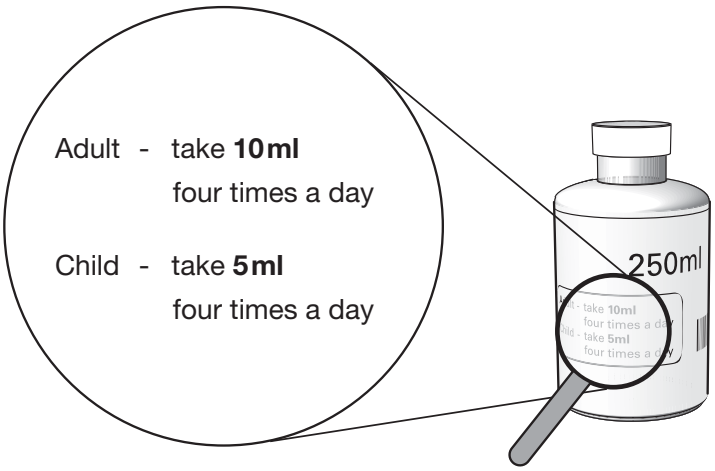
Could the rule be **Subtract 8**?

☐ Yes ☐ No

Explain your answer.

1 mark

3. A bottle contains **250 ml** of cough mixture.



One adult and **one child** need to take cough mixture **4 times a day** every day for **5 days**.

Will there be enough cough mixture in the bottle?

Explain your answer.

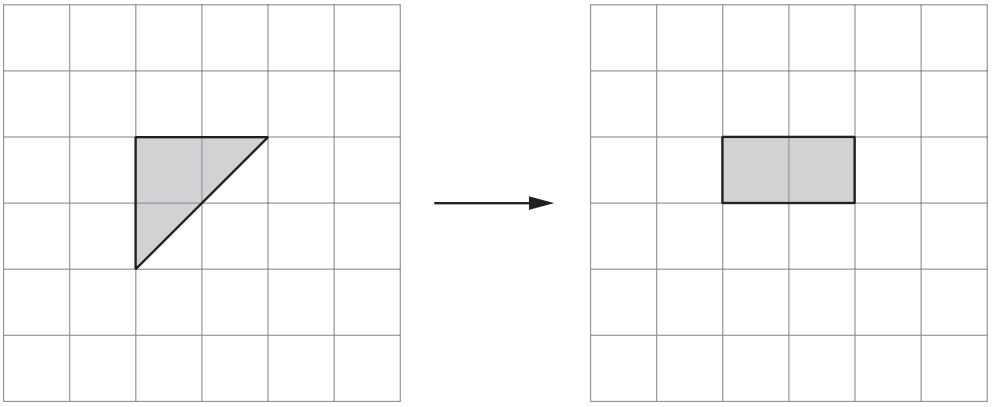
2 marks

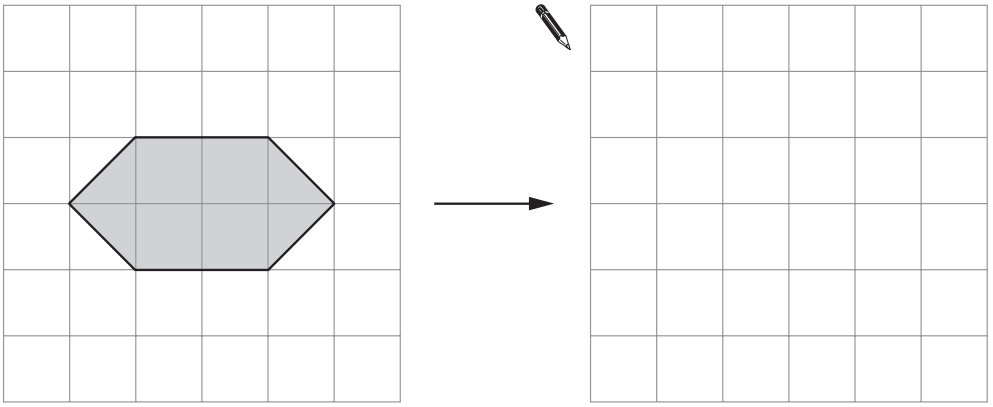
4. The grids in this question are centimetre square grids.

For each shape on the left, draw a **rectangle** that has the **same area**.

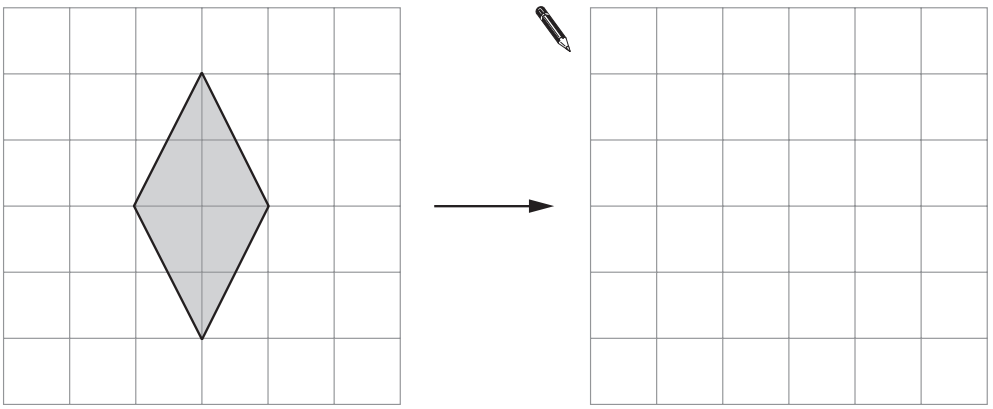
The first one is done for you.

Shape **Rectangle**





1 mark



1 mark

5. The table shows the average length of pregnancy for different mammals.

Mammal	Average length of pregnancy
Dolphin	276 days
Horse	337 days
Seal	350 days
Whale	365 days
Camel	406 days
Elephant	640 days

Use the information in the table to answer these questions.

(a) Which mammal has an average length of pregnancy of **1 year**?

_____

1 mark

(b) Which mammal has an average length of pregnancy of **50 weeks**?

_____

1 mark

(c) A human has an average length of pregnancy of **about 9 months**.

Which other mammal also has an average length of pregnancy of about 9 months?

_____

1 mark

6. Write the missing numbers in the boxes.

4 × ☐ + 20 = 180

1 mark

4 × 20 + ☐ = 180

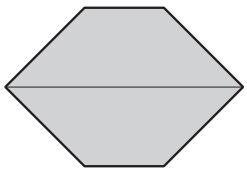
1 mark

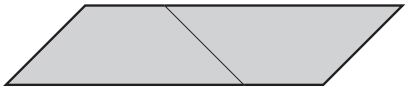
4 × ☐ − 20 = 180

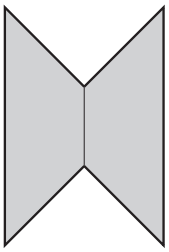
1 mark

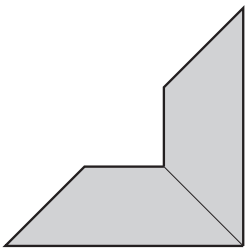
7. I use two congruent trapeziums to make the shapes below.

Tick (✓) all the shapes that are **hexagons**.









2 marks

8. The pupils in a class had a sponsored swim.

They collected **£429.24**

(a) How much is £429.24 to the **nearest hundred pounds**?

£ _____

1 mark

(b) How much is £429.24 to the **nearest ten pounds**?

£ _____

1 mark

9. I buy **12 packets** of cat food in a box.

The table shows the different varieties in the box.

Variety	Number of packets
Cod	3
Salmon	3
Trout	3
Tuna	3

(a) I am going to take out a packet at random from the box.

What is the **probability** that it will be **cod**?

1 mark

(b) My cat eats **all** the packets of **cod**.

I am going to take out a packet at random from the ones left in the box.

What is the **probability** that it will be **salmon**?

1 mark

(c) A different type of cat food has **10 packets** in a box.

The probability that the variety is chicken is **0.7**

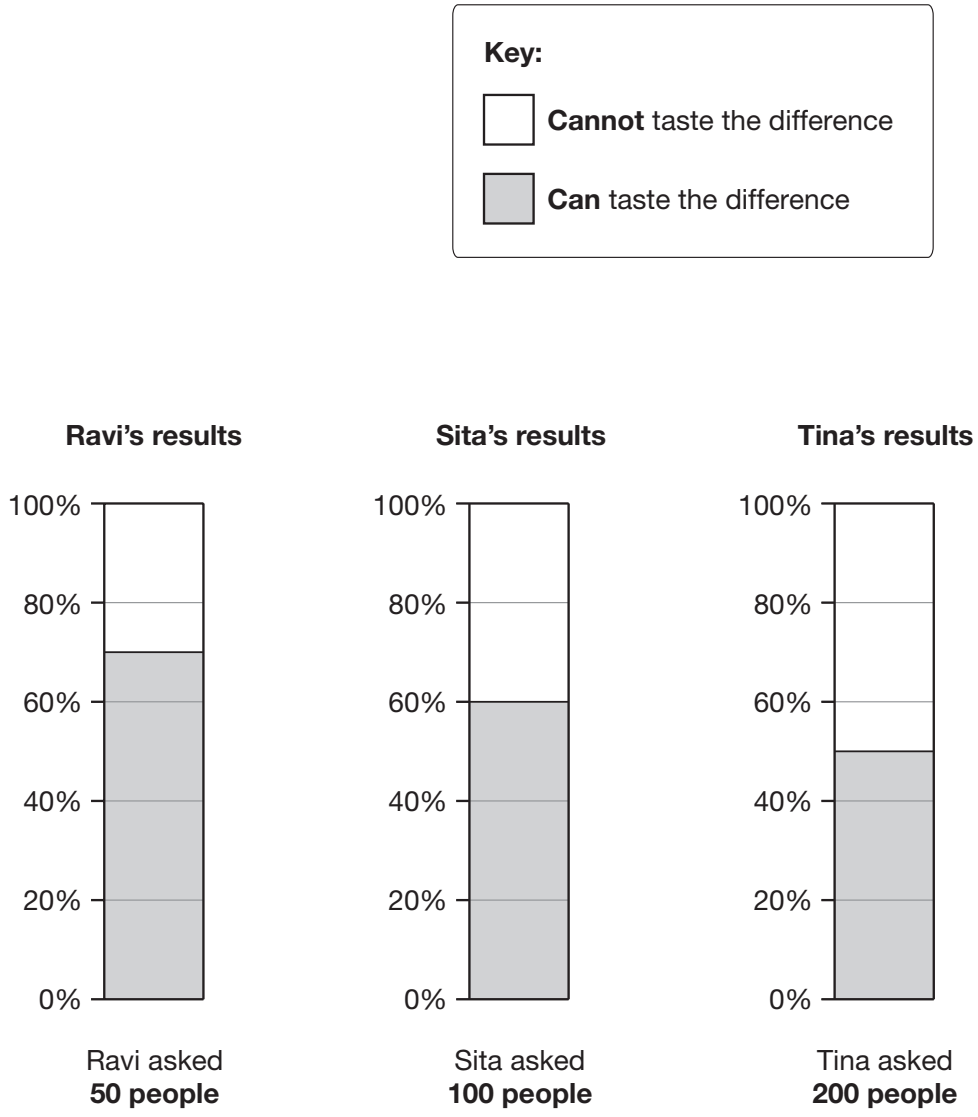
What is the probability that the variety is **not** chicken?

1 mark

10. Wine gums are sweets that are made in different colours.

Pupils tested whether people can taste the difference between black wine gums and other wine gums.

The percentage bar charts show three pupils' results.



(a) Complete the table.

	Number of people who were tested	Number of people who **can** taste the difference	Number of people who **cannot** taste the difference
Ravi	50		
Sita	100		
Tina	200		

3 marks

(b) Explain why **Tina's** results are likely to be **more reliable** than Ravi's or Sita's.

1 mark

11. Look at the three expressions below.

$8 + k$	$3k$	k^2

When $k = 10$, what is the value of each expression?

$8 + k =$ _____ $3k =$ _____ $k^2 =$ _____

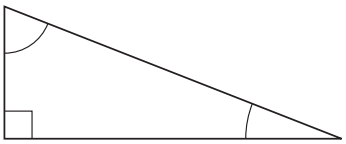
2 marks

12. Some statements in the table are true. Some are false.

Beside each statement, write **true** or **false**.

For **true** statements you must **draw an example**.

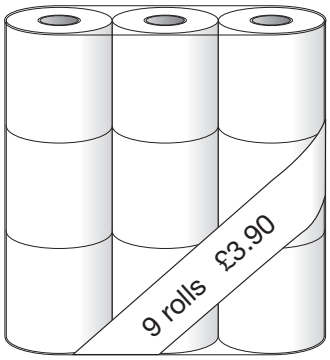
The first one is done for you.

Statement	Write **true** or **false**. If true, draw an example.
Some triangles have one right angle and two acute angles.	true 
Some triangles have three right angles.	
Some triangles have three acute angles.	
Some triangles have one obtuse angle and two acute angles.	
Some triangles have two obtuse angles and one acute angle.	

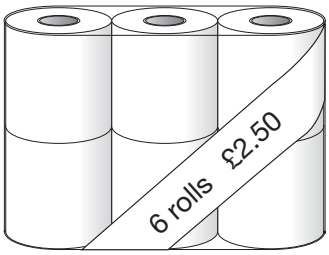
3 marks

13. A shop sells toilet rolls.

You can buy them in packs of 9 or packs of 6



Pack of 9 toilet rolls
£3.90



Pack of 6 toilet rolls
£2.50

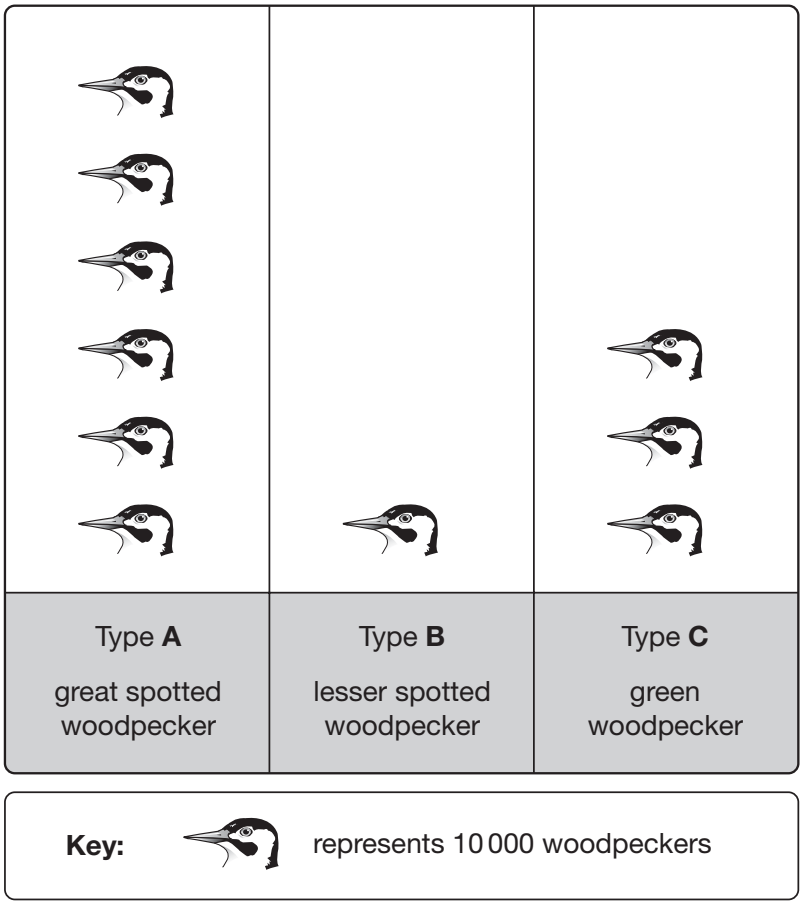
Which pack gives you better value for money?

You **must** show your working.

3 marks

14. Three different types of woodpecker live in Britain.

The pictogram shows information about the numbers of each type.



(a) Complete the table below to show the **percentages** of each type of woodpecker.

Type A	Type B	Type C
_____ %	_____ %	_____ %

1 mark

(b) The ratio of **type A : type B** woodpeckers is 6 : 1

What is the ratio of **type B : type C** woodpeckers?

____ : ____

1 mark

15. Write the missing numbers in the boxes.

120 mm is the same as ☐ cm

1 mark

120 cm is the same as ☐ m

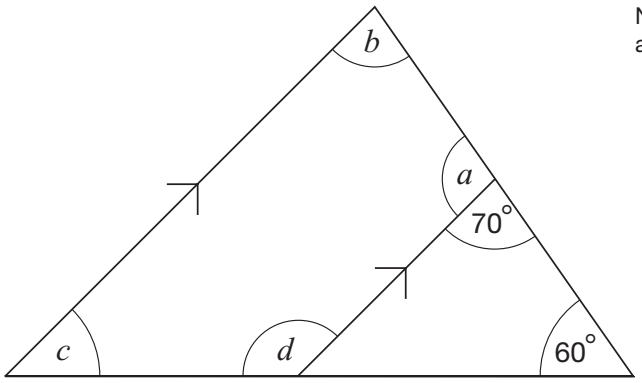
1 mark

120 m is the same as ☐ km

1 mark

16. Look at the diagram, made from four straight lines.

The lines marked with arrows are parallel.



Not drawn accurately

Work out the sizes of the angles marked with letters.

$a =$ _____ ° $b =$ _____ °

$c =$ _____ ° $d =$ _____ °

3 marks

17. Look at this equation.

$$3a + 20 = 4a + k$$

(a) If $\boldsymbol{a = 15}$, find the value of k

$k =$ _____

1 mark

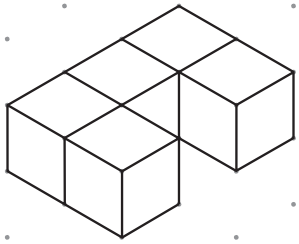
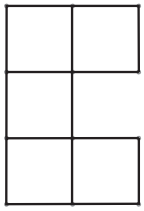
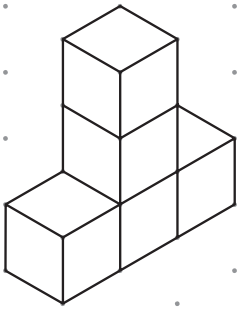
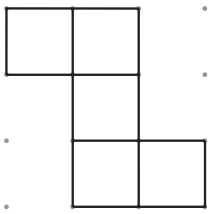
(b) If $\boldsymbol{a = -15}$, find the value of k

$k =$ _____

1 mark

18. Each shape below is made from **five cubes** that are joined together.

Complete the missing diagrams below.

Shape drawn on an isometric grid	**View from above** of the shape drawn on a square grid
	
	
	

1 mark

2 marks

19. Look at these pairs of number sequences.

The second sequence is formed from the first sequence by adding a number or multiplying by a number.

Work out the missing nth terms.

(a) 5, 9, 13, 17, … nth term is $4n + 1$

6, 10, 14, 18, … nth term is _____ 1 mark

(b) 12, 18, 24, 30, … nth term is $6n + 6$

6, 9, 12, 15, … nth term is _____ 1 mark

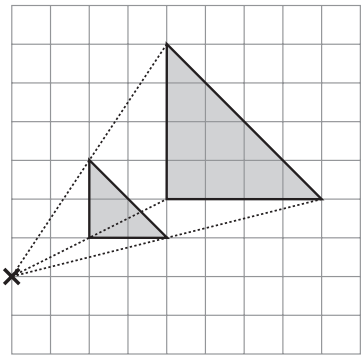
(c) 2, 7, 12, 17, … nth term is $5n - 3$

4, 14, 24, 34, … nth term is _____ 1 mark

20. Look at the square grids.

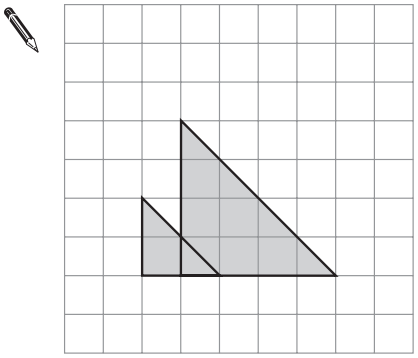
Each diagram shows an enlargement of scale factor 2

The **centre** of this enlargement is marked with a cross.

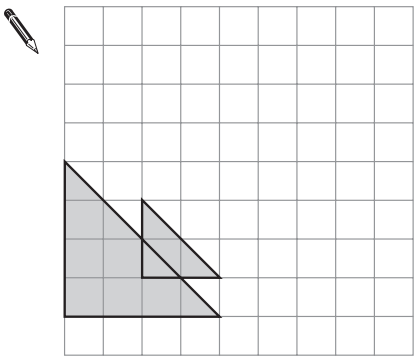


Where is the centre of enlargement in these diagrams?

Mark each one with a cross.



1 mark



1 mark

21. Kate asked people if they read a daily newspaper.

Then she wrote this table to show her results.

No	80 people = 40%
Yes	126 people = 60%

The values in the table **cannot** all be correct.

The error could be in the number of people.

Complete each table to show what the correct numbers could be.

No	80 people = 40%
Yes	_____ people = 60%

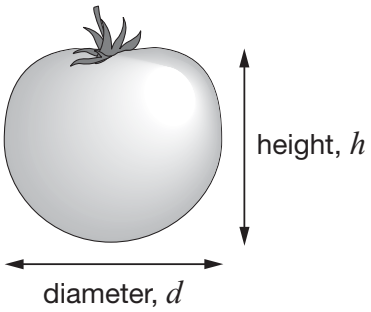
1 mark

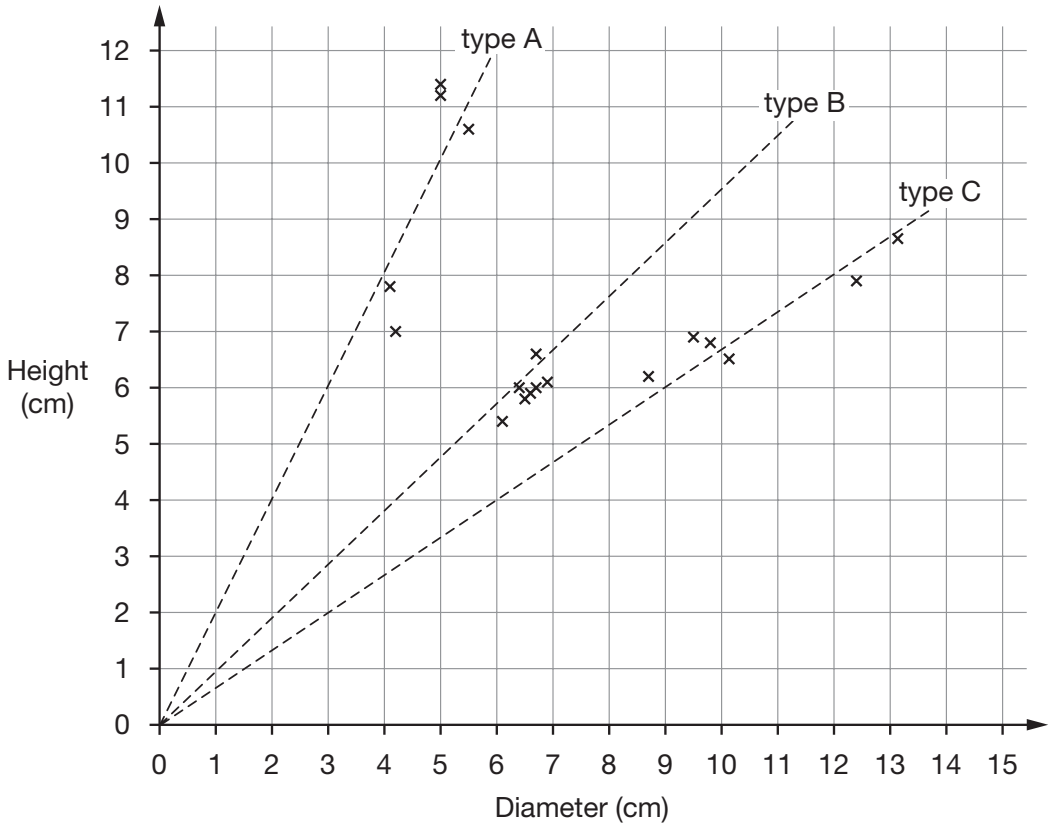
No	_____ people = 40%
Yes	126 people = 60%

1 mark

22. The graph shows information about the diameters and heights of a sample of three types of tomato.

The dotted lines on the graph can be used to decide which type of tomato each point is likely to represent.





(a) The diameter of a tomato of **type C** is **11 cm**.

What would you expect its height to be?

_____ cm

1 mark

(b) The diameter of a different tomato is 3.2cm. Its height is 5.8cm.

Which of the three types of tomato is it most likely to be?

☐ A ☐ B ☐ C

Explain your answer.

1 mark

(c) Which type of tomato is most nearly **spherical** in shape?

☐ A ☐ B ☐ C

Explain your answer.

1 mark

23. Multiply out this expression.

Write your answer as simply as possible.

$5(x + 2) + 3(7 + x)$

2 marks

END OF TEST

END OF TEST

QCA, Key Stage 3 Team, 83 Piccadilly, London W1J 8QA

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