

# Ma

KEY STAGE  
**3**

TIER  
**4–6**

# 2004

# Mathematics test

## Paper 1

### Calculator not 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 **must not** use a calculator for any question in this test.
- You will need: pen, pencil, rubber, ruler, mirror and tracing paper (optional).
- 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

## Instructions

### Answers



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

### Calculators

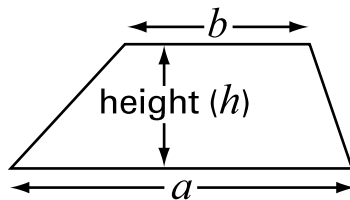


You **must not** use a calculator to answer any question in this test.

## Formulae

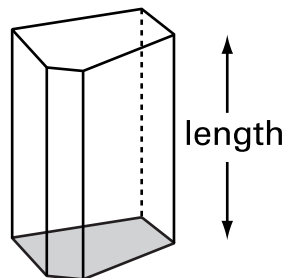
You might need to use these formulae

### Trapezium



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

### Prism



$$\text{Volume} = \text{area of cross-section} \times \text{length}$$

1. There are **seven different ways** to make **8p** with coins.

Complete the table to show the seven ways to make 8p.

Two have been done for you.

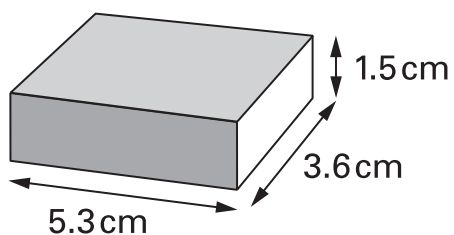


Number of 5p coins	Number of 2p coins	Number of 1p coins
0	0	8
0	1	6

. . . . .  
 . . . . .  
 . . . . .  
 3 marks



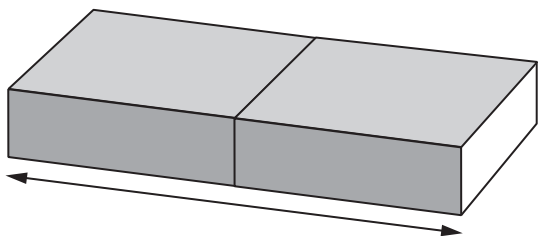
2. The diagram shows a matchbox.  
Its length is 5.3cm. Its width is 3.6cm. Its height is 1.5cm.



Not drawn accurately

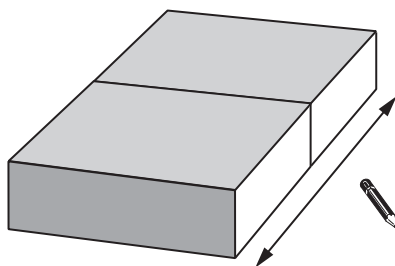
- (a) I join **two** matchboxes in different ways.

Fill in the missing values.



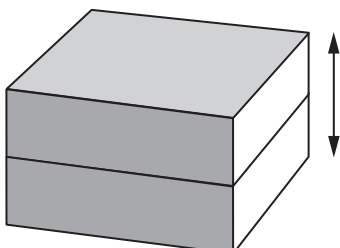
length =                  cm

.....  
1 mark



width =                  cm

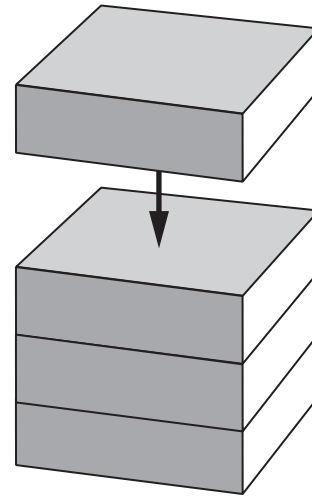
.....  
1 mark



height =                  cm

.....  
1 mark

(b) I start joining matchboxes like this:



How many matchboxes will be in the pile when its height is **12 cm**?

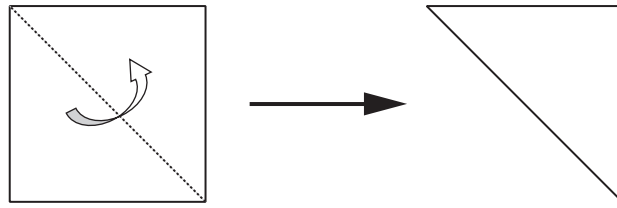


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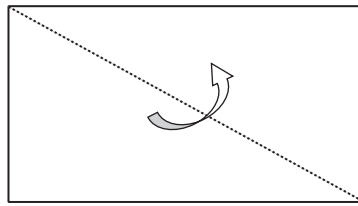
1 mark



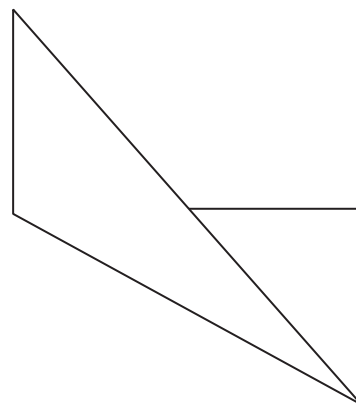
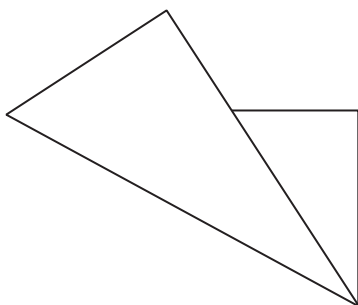
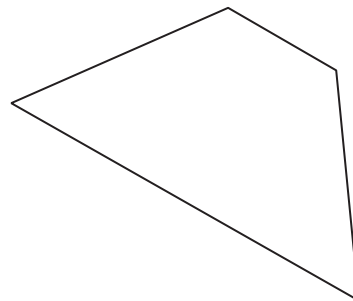
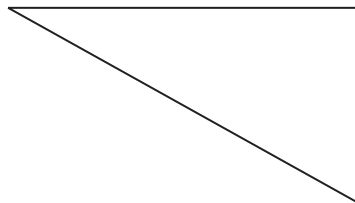
3. When you fold a **square** along a diagonal, you see a triangle.



(a) What do you see when you fold a **rectangle** along a diagonal?



Ring the correct answer below.

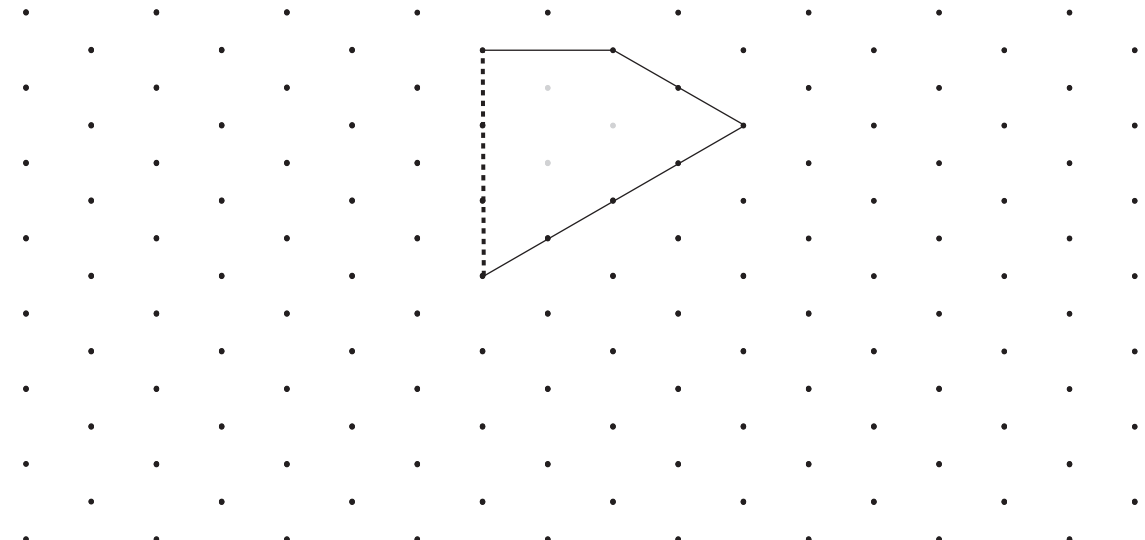


1 mark

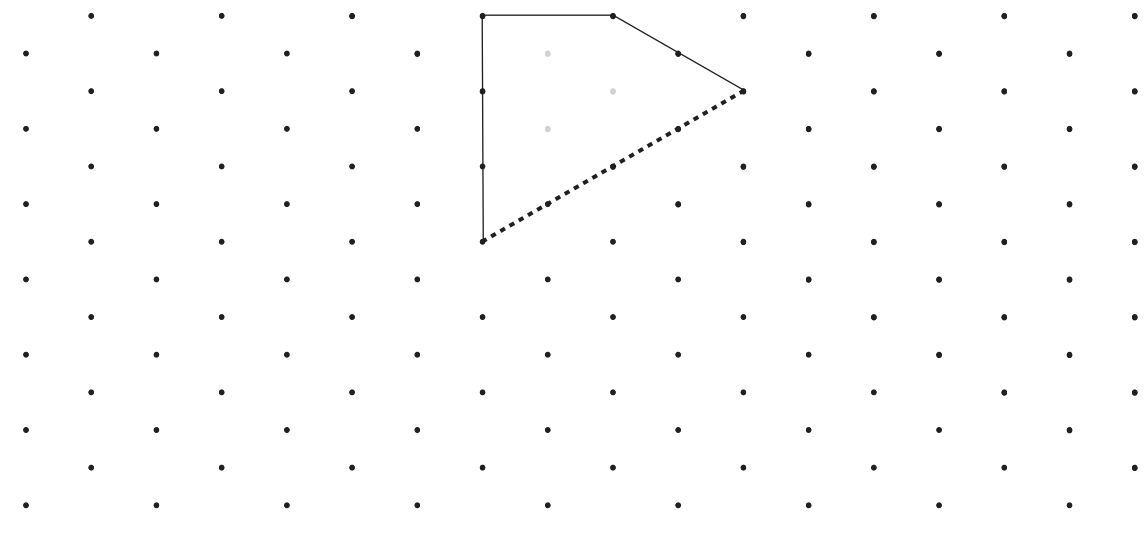
(b) Two different shapes are folded along a line of symmetry.

For each shape, the **dashed line** is the **fold line**.

For each shape, draw what the shape looked like **before** it was folded.



1 mark



1 mark

Isometric grid



4. I buy a widescreen television costing **£1290**  
 I pay **£900 now**, then  
 I pay the rest of the money in **3 equal payments**.

How much is each payment?

Show your working.

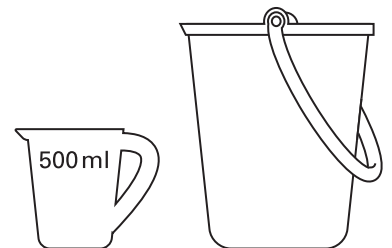


£

.....  
 .....  
 2 marks

5. Steve needs to put **1 litre** of water in a bucket.  
 He has a **500ml** jug.

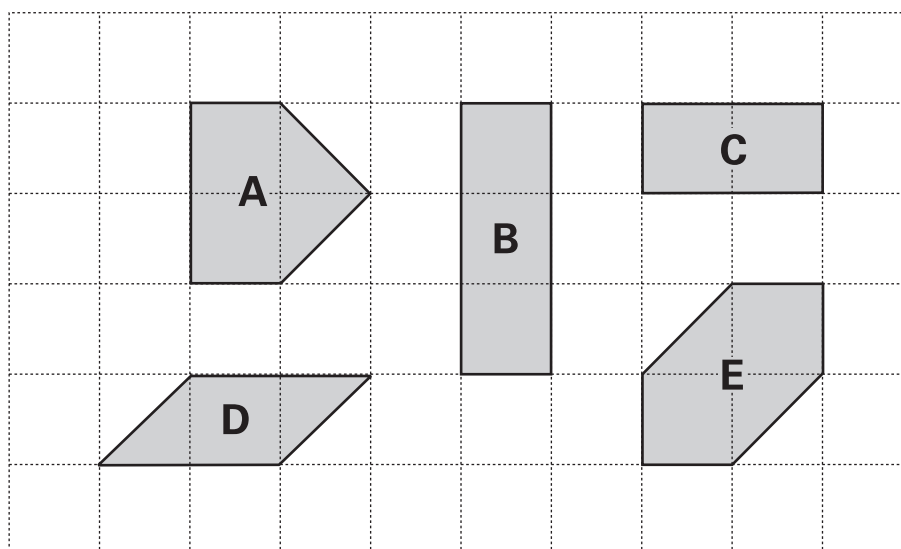
Explain how he can measure 1 litre of water.



.....  
 1 mark



6. The diagram shows some shapes on a 10 by 6 square grid.



- (a) Which **two** shapes have the **same area** as shape **A**?



.....

.....  
1 mark

- (b) Which **two** shapes have the **same perimeter** as shape **A**?



.....

.....  
1 mark

- (c) How many of shape **C** would you need to cover a 10 by 6 square grid?

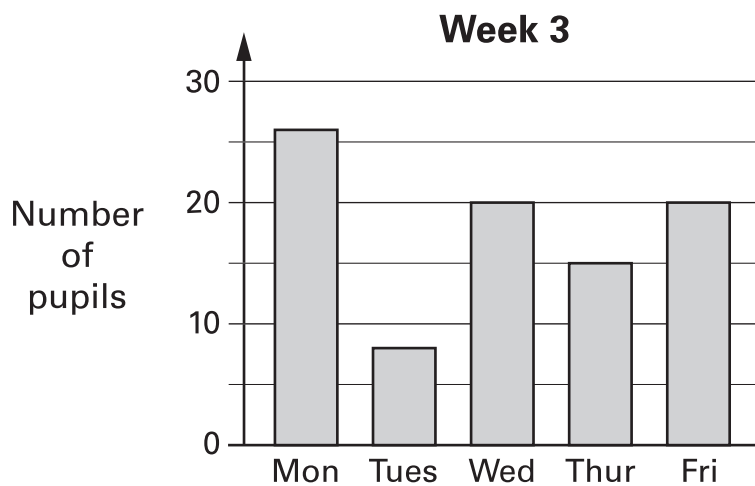
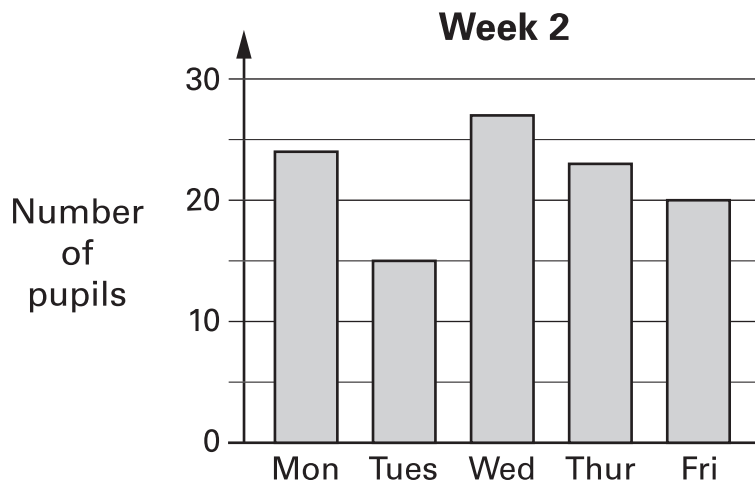
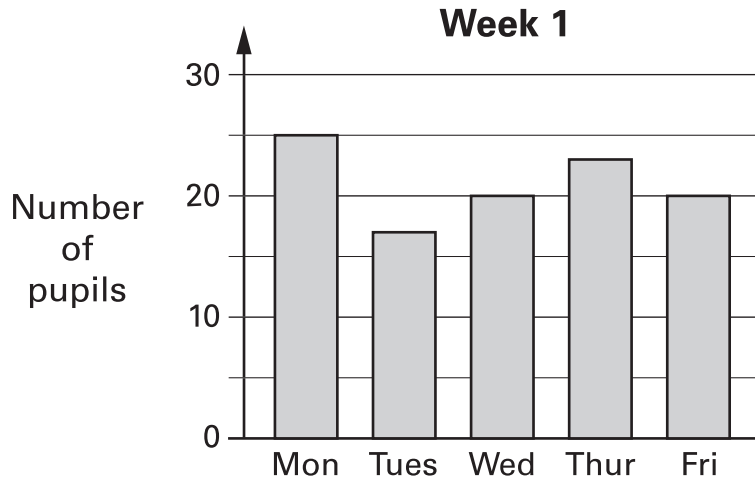


.....

.....  
1 mark



7. The bar charts show how many pupils went to a maths club.



---

Is each statement below true or false,  
or is there not enough information to tell?

Tick (✓) the correct box.

(a) In each of these weeks, the day with the **most pupils** was **Monday**.



True

False

Not enough information

Explain your answer.



.....  
1 mark

(b) In each of these weeks, the **same number** of pupils went to the club  
on **Friday**.



True

False

Not enough information

Explain your answer.



.....  
1 mark

(c) In each of these weeks, the **same pupils** went to the club on **Friday**.



True

False

Not enough information

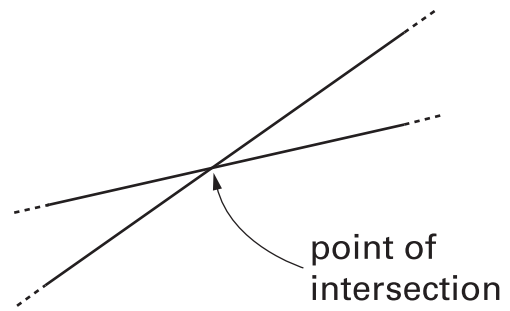
Explain your answer.



.....  
1 mark



8. The diagram shows two straight lines.  
Where the lines **cross** is called  
a **point of intersection**.



- (a) Draw **three** straight lines that have only **one** point of intersection.



.....  
1 mark

- (b) Now draw **three** straight lines that have **three** points of intersection.



.....  
1 mark

- (c) **Three** straight lines have exactly **two** points of intersection.

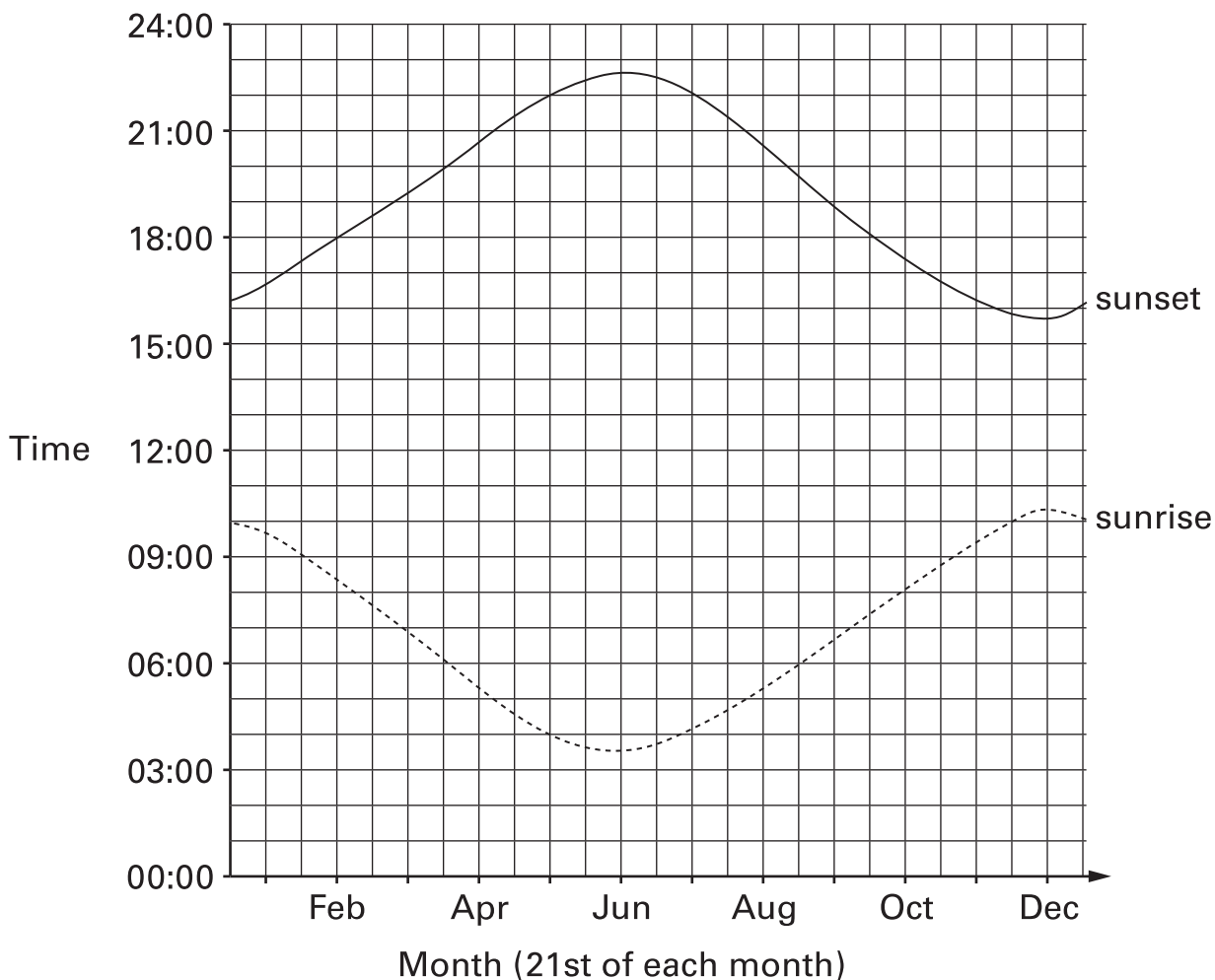
Complete the sentence below.



Two of the lines must be .....

.....  
1 mark

9. The graph shows at what **time** the sun rises and sets in the American town of Anchorage.



The day with the **most** hours of daylight is called the longest day.

Fill in the gaps below, using the information from the graph.



The **longest day** is in the month of .....

On this day, there are about ..... hours of daylight.

The **shortest day** is in the month of .....

On this day, there are about ..... hours of daylight.

.....

.....

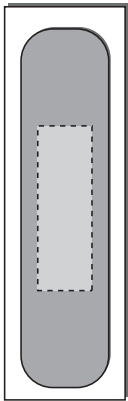
.....

3 marks

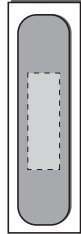


10. I buy a box of different size plasters.

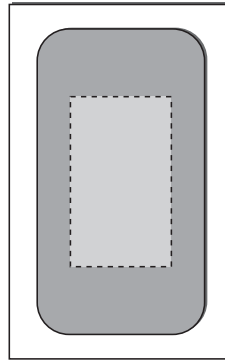
Assume each plaster is equally likely to be the top plaster inside the box.



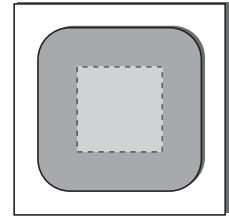
**16** plasters  
of **size A**



**16** plasters  
of **size B**



**2** plasters  
of **size C**



**1** plaster  
of **size D**

Altogether there are **35** plasters.

I take the top plaster from inside the box.

(a) What is the probability that the plaster is of **size D**?



.....  
1 mark

(b) What is the probability that the plaster is of **size A**?



.....  
1 mark

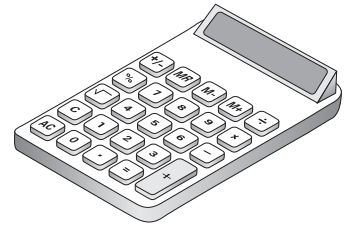
(c) What is the probability that the plaster is **not** of **size A**?



.....  
1 mark

11. You can buy a new calculator for **£1.25**

In 1979 the same type of calculator  
cost **22 times** as much as it costs now.



How much did the same type of calculator cost in 1979?

Show your working.

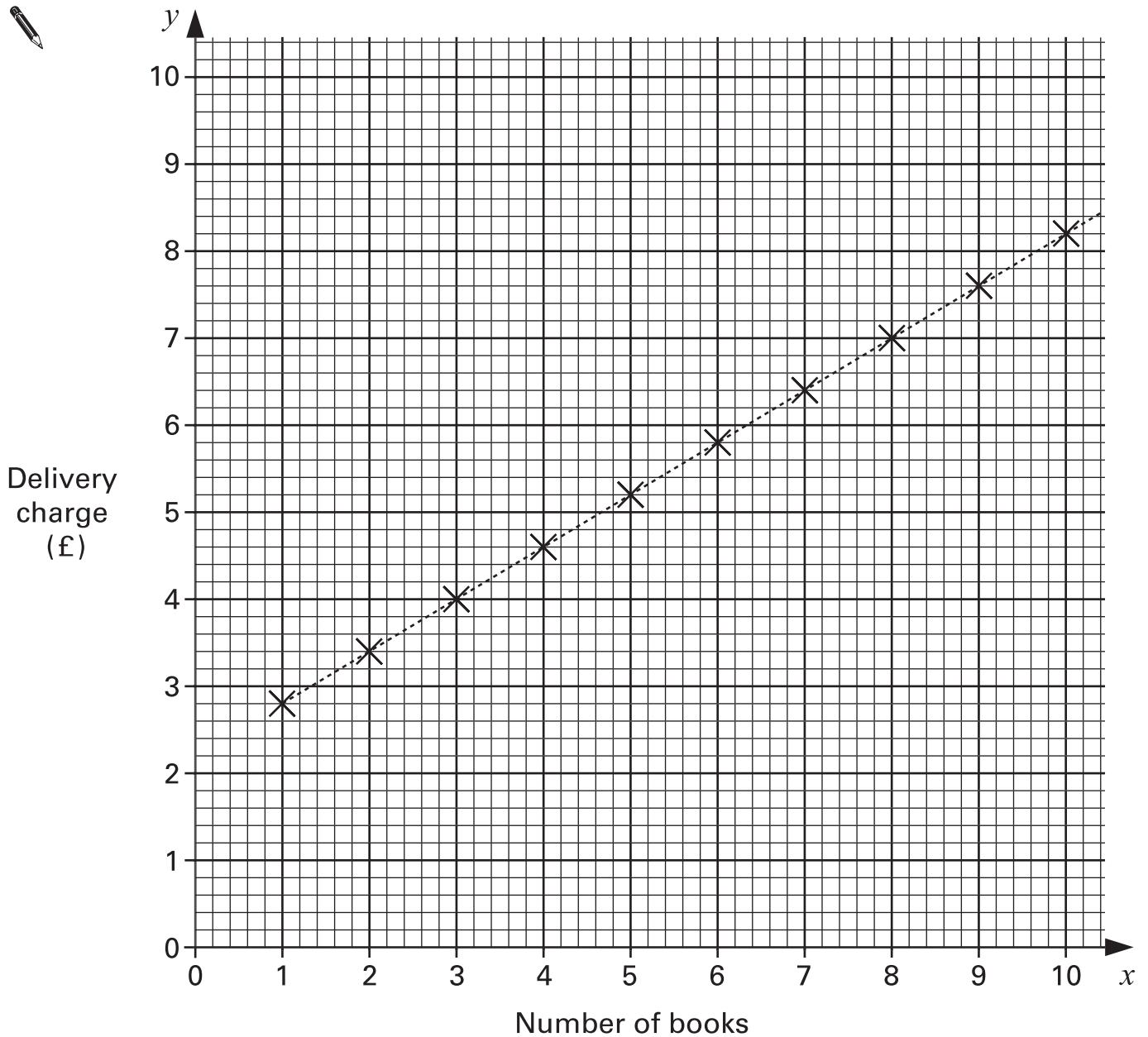


£

.....  
.....  
2 marks




12. A company sells books using the internet.  
The graph shows their delivery charges.





(a) Use the graph to fill in the values in this table.



Number of books	Delivery charge (£)
8	
9	

.....  
1 mark

(b) For every extra book you buy, how much more must you pay for delivery?



..... p


.....  
1 mark

(c) A second company sells books using the internet.  
Its delivery charge is **£1.00 per book**.

On the graph opposite, draw a line to show this information.

.....  
1 mark

(d) Complete the sentence.



Delivery is cheaper with the **first** company  
if you buy at least ..... books.

.....  
1 mark



13. One way to make a magic square is to substitute numbers into this algebra grid.


$a + b$	$a - b + c$	$a - c$
$a - b - c$	$a$	$a + b + c$
$a + c$	$a + b - c$	$a - b$

- (a) Complete the magic square below using the values

$a = 10$

$b = 3$

$c = 5$



		5
	10	
15		

.....  
 .....  
 2 marks

(b) Here is the algebra grid again.

$a + b$	$a - b + c$	$a - c$
$a - b - c$	$a$	$a + b + c$
$a + c$	$a + b - c$	$a - b$

I use **different values** for  $a$ ,  $b$  and  $c$  to complete the magic square.

20	21	7
3	16	29
25	11	12

What values for  $a$ ,  $b$  and  $c$  did I use?

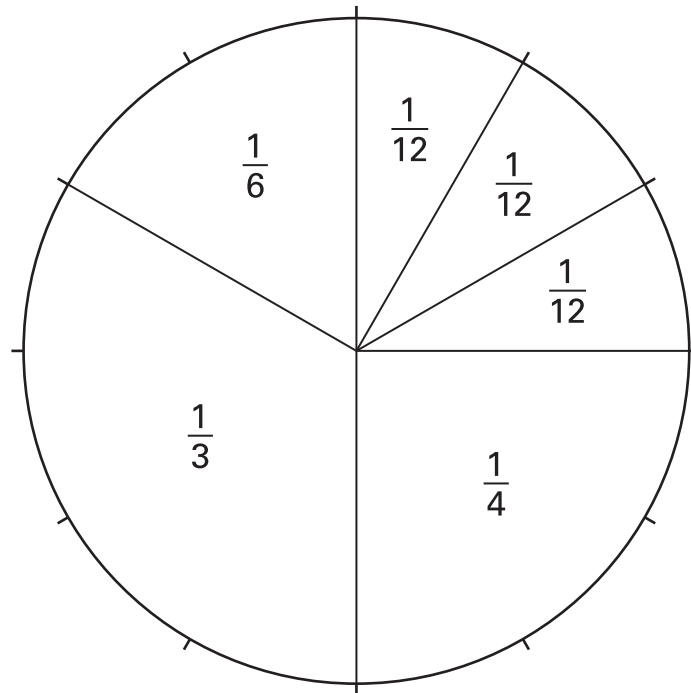


$a = \dots\dots\dots$        $b = \dots\dots\dots$        $c = \dots\dots\dots$

.....  
 .....  
 2 marks



14. Look at this diagram.



The diagram can help you work out some fraction calculations.

Calculate



$$\frac{1}{12} + \frac{1}{4} =$$

.....  
1 mark

$$\frac{1}{3} + \frac{1}{4} =$$

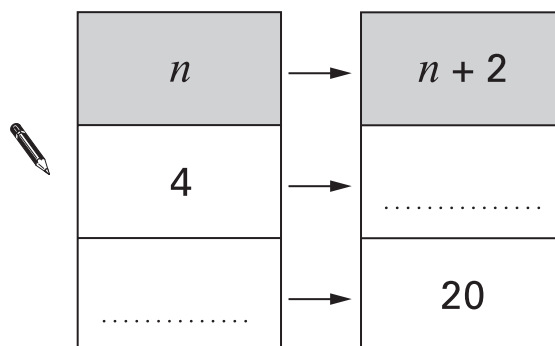
.....  
1 mark

$$\frac{1}{3} - \frac{1}{6} =$$

.....  
1 mark

15. (a) A function maps the number  $n$  to the number  $n + 2$

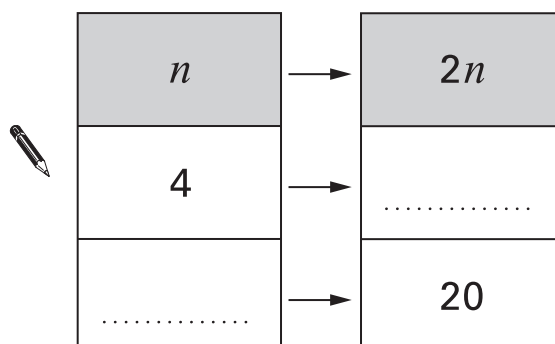
Complete the missing values.



.....  
1 mark

(b) A different function maps the number  $n$  to the number  $2n$

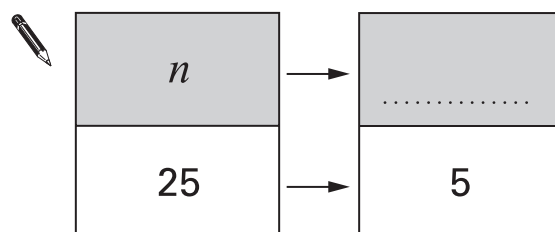
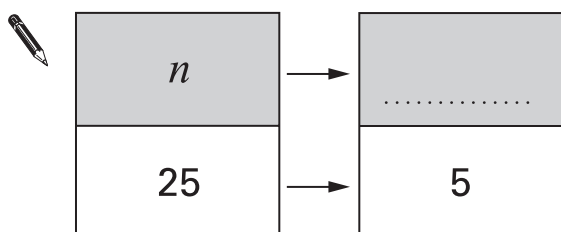
Complete the missing values.



.....  
1 mark

(c) Many different functions can map the number 25 to the number 5

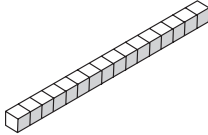
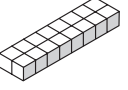


Complete the tables by writing two **different** functions.



.....  
2 marks



16. You can make only four different cuboids with **16 cubes**.

		Dimensions		
Cuboid <b>A</b>		1	1	16
Cuboid <b>B</b>		1	2	8
Cuboid <b>C</b>		1	4	4
Cuboid <b>D</b>		2	2	4

- (a) Which of the cuboids **A** and **D** has the **larger surface area**?

Tick (✓) the correct answer below.



Cuboid A

Cuboid D

Both the same

Explain how you know.



1 mark

(b) Which cuboid has the **largest volume**?

Tick (✓) the correct answer below.



Cuboid A

Cuboid B

Cuboid C

Cuboid D

All the same

1 mark

(c) How many of **cuboid D** make a cube of dimensions **4 × 4 × 4**?



.....

1 mark

(d) You can make only six **different** cuboids with **24 cubes**.

Complete the table to show the dimensions.

Two have been done for you.



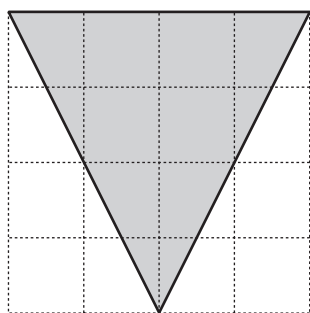
	Dimensions		
Cuboid <b>E</b>	1	1	24
Cuboid <b>F</b>	1	2	12
Cuboid <b>G</b>			
Cuboid <b>H</b>			
Cuboid <b>I</b>			
Cuboid <b>J</b>			

.....

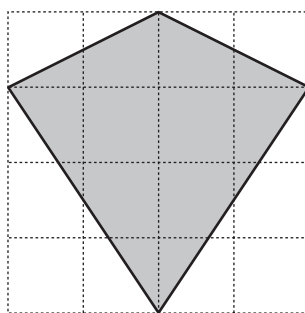
.....

3 marks

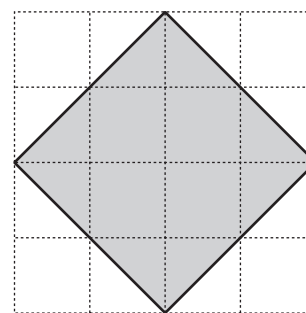
17. The shapes below are drawn on square grids.



shape A



shape B



shape C

- (a) Is shape **A** an **equilateral triangle**? Tick (✓) Yes or No.




Yes

No

Explain your answer.



.....  
1 mark

- (b) Is shape **B** a **kite**?




Yes

No

Explain your answer.



.....  
1 mark

- (c) Is shape **C** a **square**?




Yes

No

Explain your answer.



.....  
1 mark



18. Write the missing numbers in the table.

The first row is done for you.

First number	Second number	Sum of first and second numbers	Product of first and second numbers
3	6	9	18
5	-3		
-8		-5	



.....  
1 mark

.....  
1 mark

19. Calculate  $\frac{5}{6} \times \frac{3}{5}$

Show your working.

Write your answer as a fraction in its **simplest form**.



.....  
.....  
2 marks



20. Rearrange the equations.



$$b + 4 = a$$

$$b = \dots\dots\dots$$

.....  
1 mark

$$4d = c$$

$$d = \dots\dots\dots$$

.....  
1 mark

$$m - 3 = 4k$$

$$m = \dots\dots\dots$$

.....  
1 mark

**END OF TEST**



