Ma

KEY STAGE
3

TIER
4–6

2009

Mathematics test

Paper 2

Calculator allowed

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.

TOTAL MARKS	

Instructions

Answers

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

Calculators

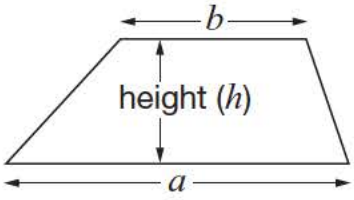
You **may** use a calculator to answer any question in this test.

Formulae

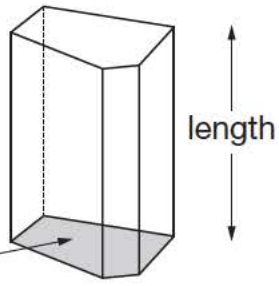
You might need to use these formulae

Trapezium

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



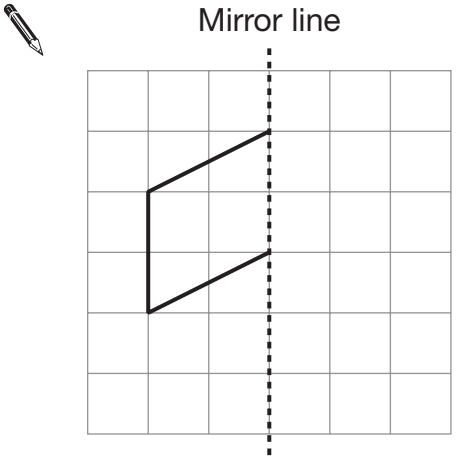
Prism



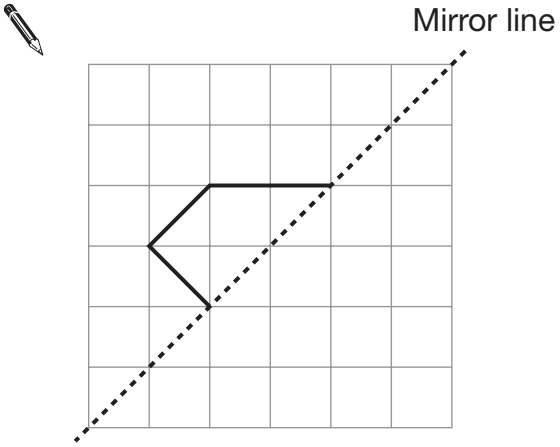
Volume = area of cross-section × length

1. The diagrams in this question are drawn on square grids.

Reflect the shapes in the mirror lines.



1 mark



1 mark

2. Pupils take a test that has three different papers.

Each pupil adds their marks from all three papers to find their total mark.

The table shows how to change the total mark to a grade.

Total mark	Grade
104 or more	A
From 79 to 103	B
From 53 to 78	C
From 34 to 52	D
33 or less	E

(a) Here are Simon's marks.

Paper 1	Paper 2	Paper 3
26 marks	33 marks	18 marks

What grade did Simon get on the test?

grade _____

1 mark

(b) Here are Jenna's marks from paper 1 and paper 2

Paper 1	Paper 2	Paper 3
48 marks	35 marks	?

Jenna's grade on the test was **grade A**.

Complete the sentence below.

Jenna must have scored **at least** _____ marks on paper 3

1 mark

3. (a) Write the missing numbers in the sentences below.

2735 rounded to the **nearest hundred** is _____

1 mark

2735 rounded to the **nearest thousand** is _____

1 mark

(b) Give an example of what the missing number could be in the sentence below.

_____ rounded to the **nearest ten** is **800**

1 mark

4. The table shows the cost of tickets for visiting a castle.

Tickets	
Family	**£17.00**
Adult	**£6.50**
Child	**£4.50**

Two adults and two children visit the castle.

They buy a **family** ticket.

How much **more** would it have cost to buy **two adult** tickets and **two child** tickets?

£

2 marks

5. Here is some information about a baby.

> He was born on 2nd March 2005.
>
> He smiled for the first time on 30th March 2005.
>
> His first tooth appeared on 2nd December 2005.

(a) **How many weeks** old was the baby when he smiled for the first time?

_____ weeks

1 mark

(b) **How many months** old was the baby when his first tooth appeared?

_____ months

1 mark

6. (a) I count on in **equal steps**.

My fourth number is 42, my fifth number is 47

?			42	47

What is my first number?

1 mark

(b) I count on in **equal steps**.

My first number is –3, my fifth number is 5

–3		?		5

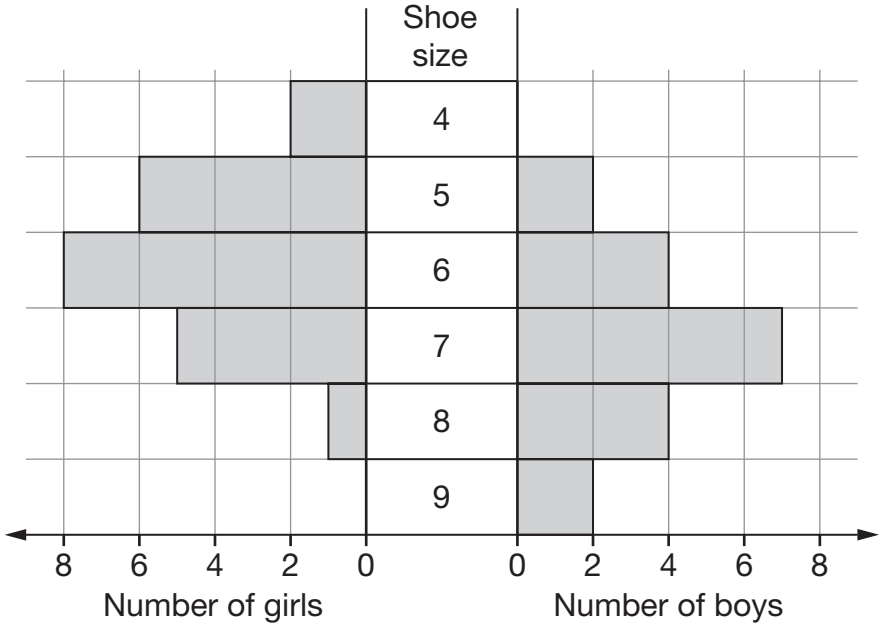
What is my third number?

2 marks

7. Kim asked some pupils:

> To the nearest whole number, what is your shoe size?

The chart shows her results.



(a) How many pupils had **size 6** shoes?

_____

1 mark

(b) Kim asked **more girls** than boys.

How many more?

_____

1 mark

(c) Who had the bigger **range** of shoe sizes?

☐ Girls ☐ Boys ☐ Both the same

Explain your answer.

1 mark

8. Find the values of x and y

$694 + 396 + x = 1742$

$x =$ _____

1 mark

$y \div 13 = 34$

$y =$ _____

1 mark

9. Dan says:

'All **factors of 70** are even numbers.'

Is he correct?

☐ Yes ☐ No

Explain your answer.

1 mark

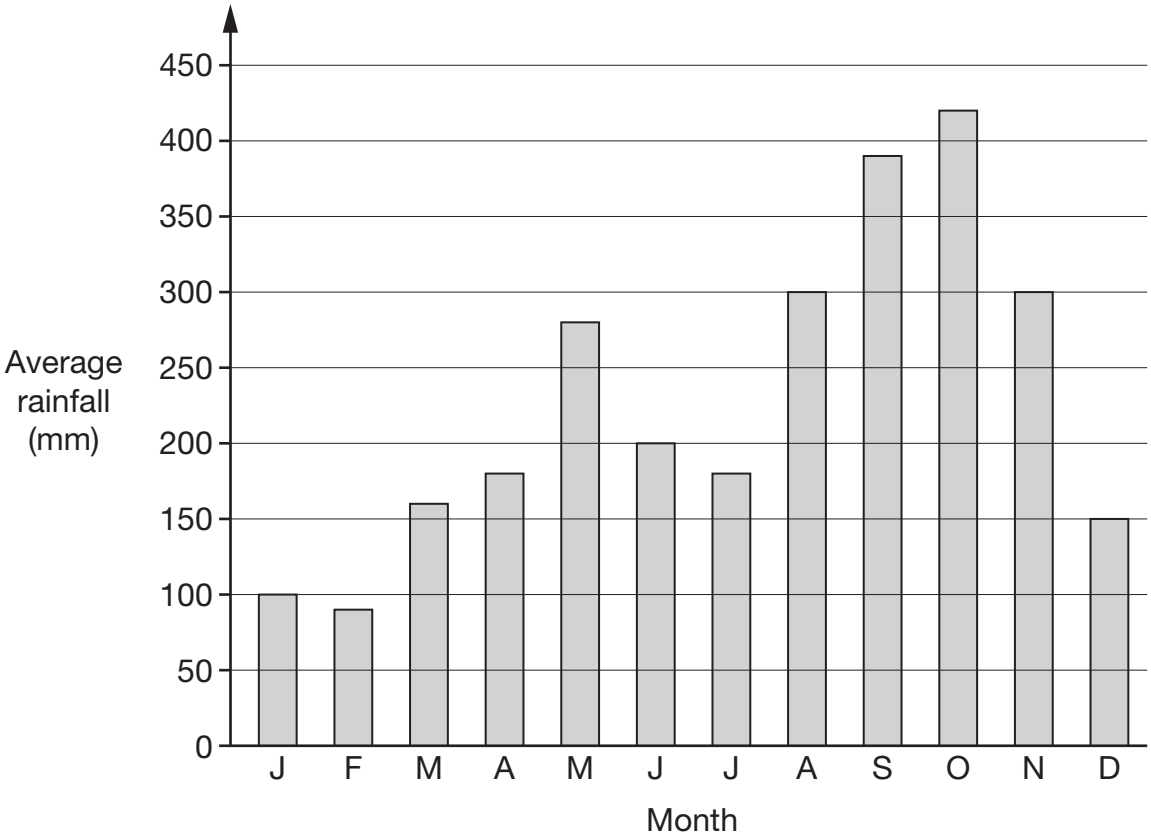
10. Complete the table to show what the units measure.

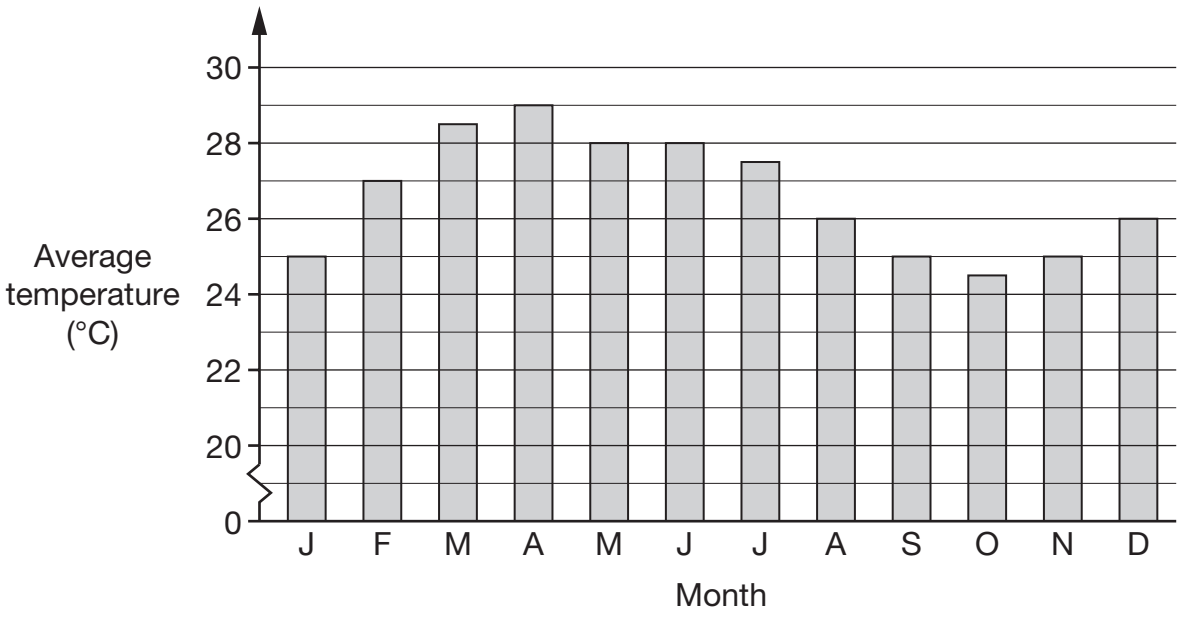
The first row is done for you.

	Length	Area	Volume	Mass
Centimetres	✓			
Litres				
Miles				
Grams				
Square metres				
Ounces				

2 marks

11. The charts show information about a rainforest.





Use the charts to answer these questions.

(a) In the month that has the **lowest** average **rainfall**, what is the average **temperature**?

_____ °C

1 mark

(b) In the month that has the **highest** average **temperature**, what is the average **rainfall**?

_____ mm

1 mark

(c) Sanjay has decided to visit the rainforest.

He does **not** like high temperatures and does **not** like high rainfall.

In which month do you think Sanjay should visit?

Put a ring round the correct month below.

January March April

October December

1 mark

12. Here are the prices of doughnuts at two different shops.

Shop A	Shop B
3 doughnuts for £2	5 doughnuts for £3.50

I want to buy **15** doughnuts.

In which shop are the doughnuts **cheaper**?

You **must** show your working.

Tick (✓) your answer.

☐ Shop A ☐ Shop B

2 marks

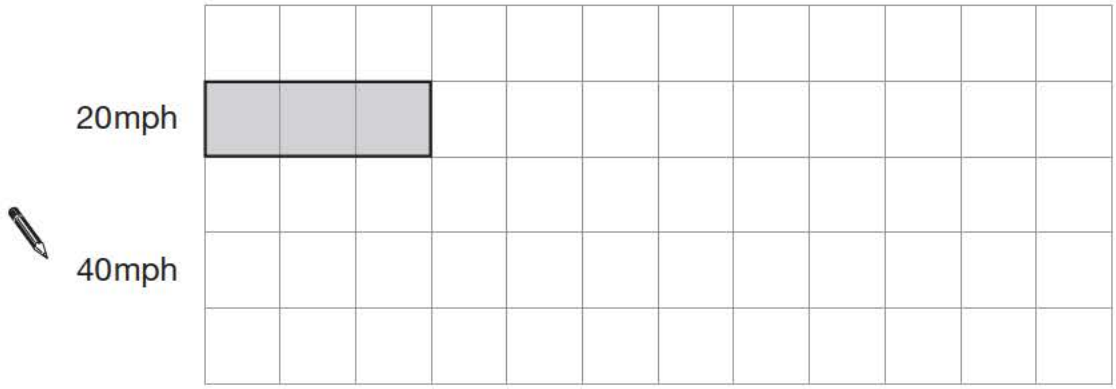
13. The table shows the stopping distances for a car at different speeds.

Speed	Stopping distance
20 mph	12 metres
40 mph	36 metres
60 mph	72 metres

(a) Look at the square grid below.

It shows the bar for the stopping distance at 20 mph.

Use the same scale to draw the bar for the stopping distance at **40 mph**.



1 mark

(b) The bar for the stopping distance at 60 mph will not fit on the grid.

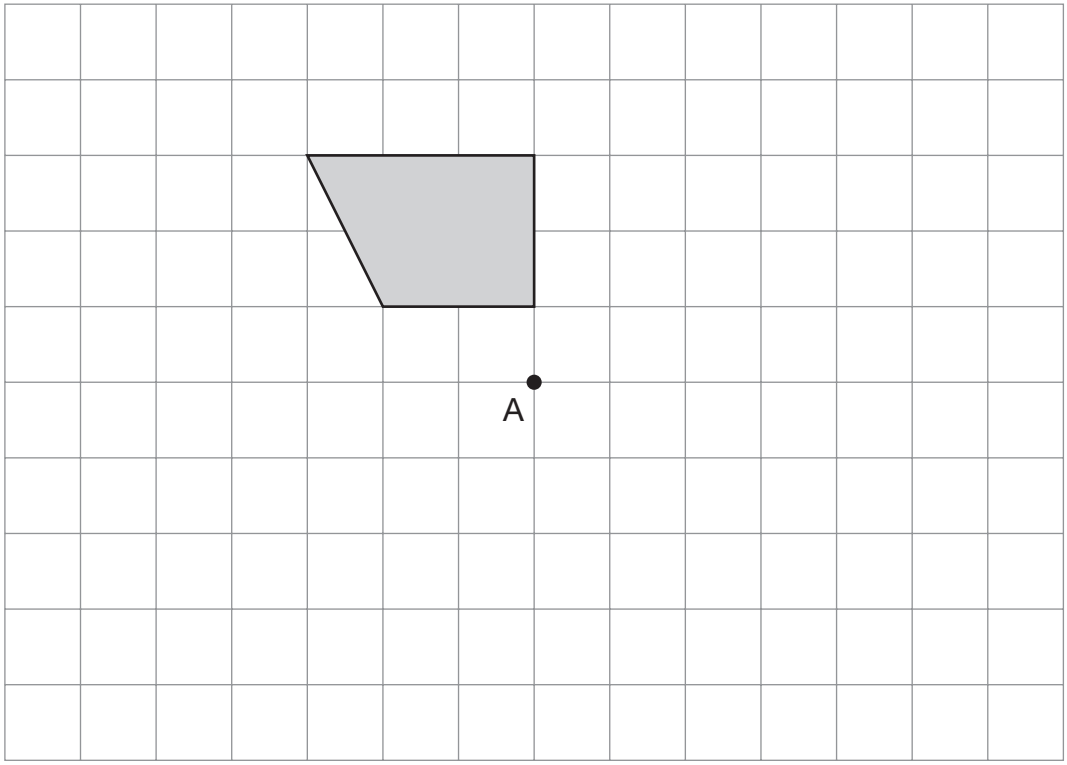
How many squares long should the bar be?

1 mark

14. Here is a shaded shape drawn on a square grid.

Rotate the shape **180°** about point A.

Draw the shape in its new position on the grid.



2 marks

15. Use $a = 7$ and $b = 28$ to work out the value of these expressions.

The first one is done for you.

$a + b = 35$

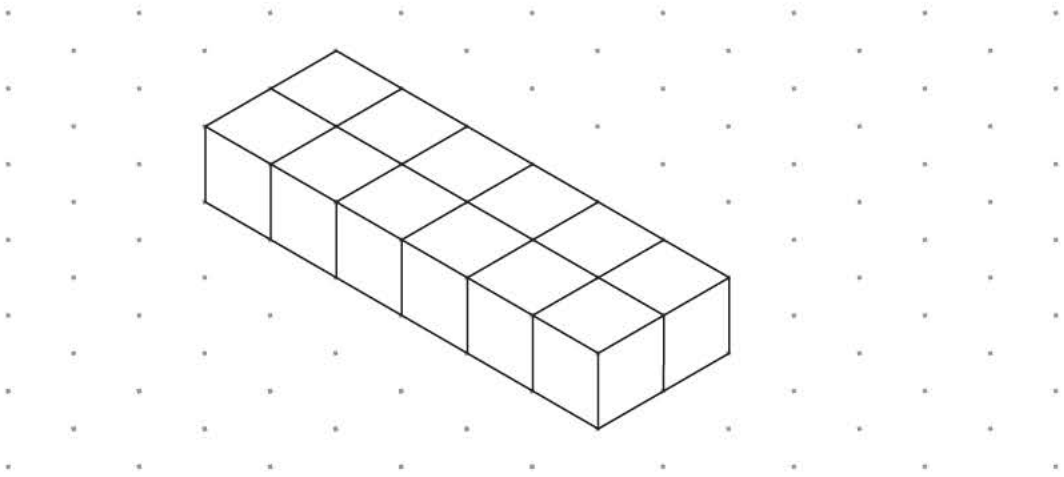
$ab =$ _____ 1 mark

$\frac{b}{a} =$ _____ 1 mark

$(a + b)^2 =$ _____ 1 mark

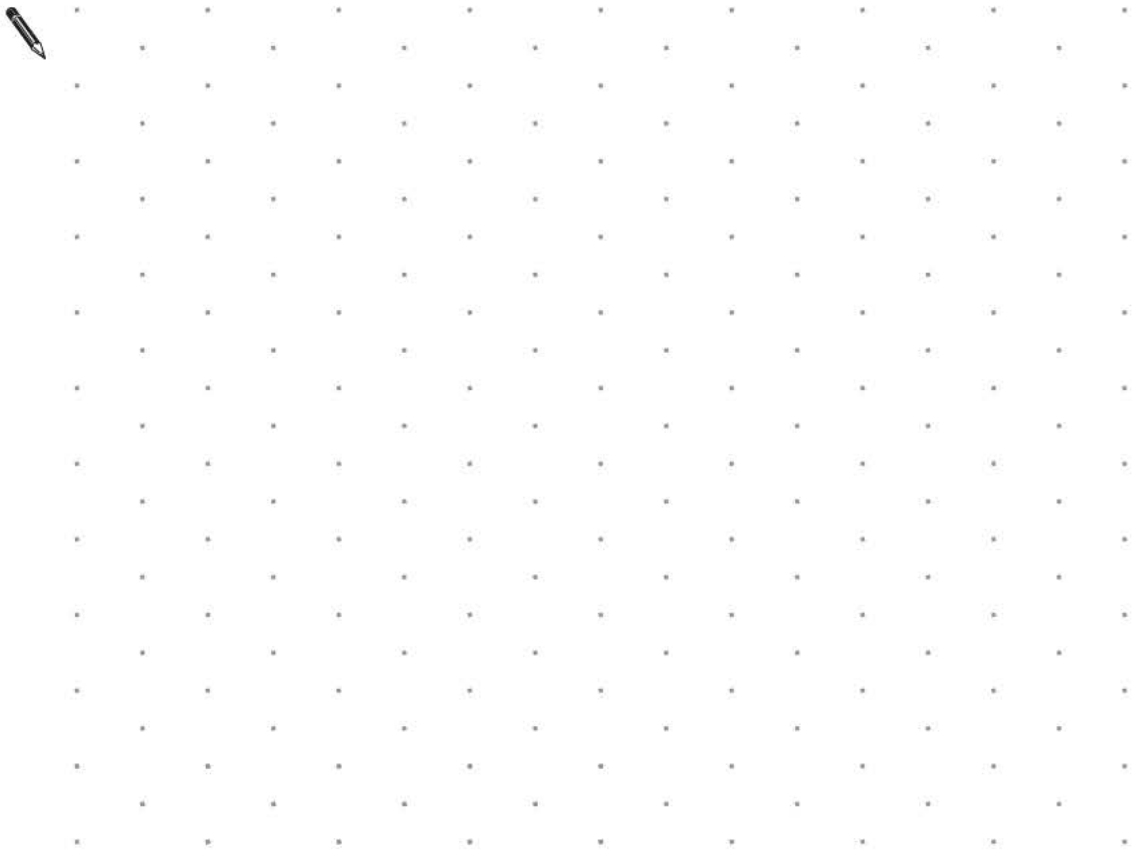
16. Look at the cuboid drawn on the grid.

It is made from **12 cubes**.



Isometric grid

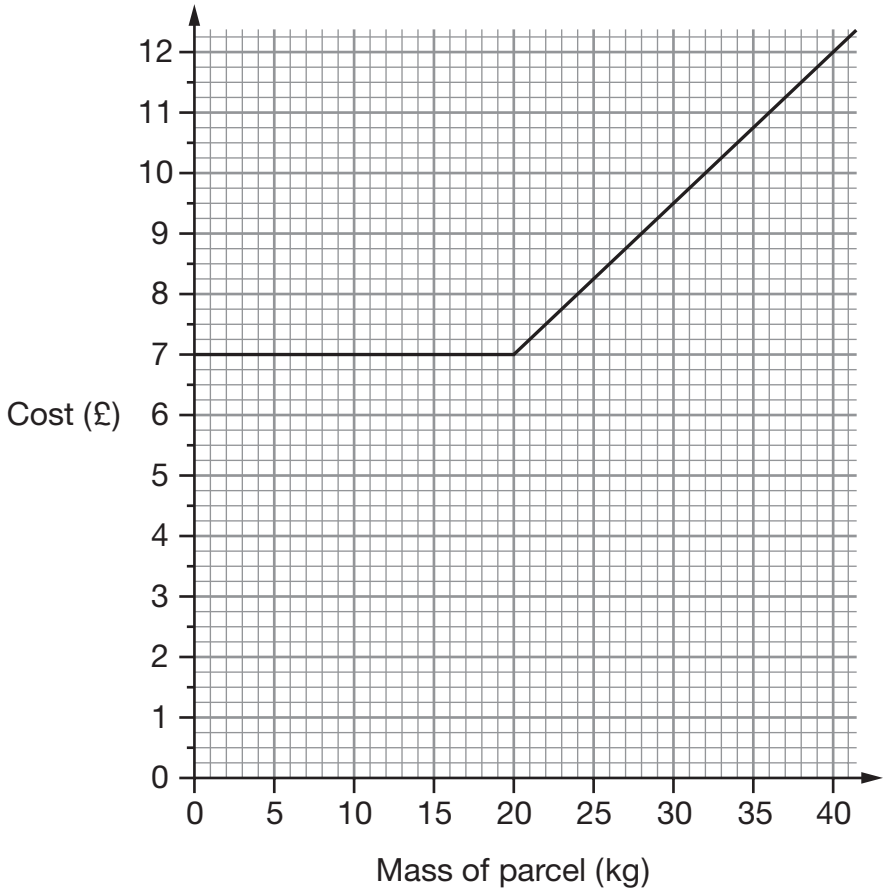
On the grid below, draw a **different** cuboid made from 12 cubes.



2 marks

Isometric grid

17. The graph shows how much a company charges to deliver parcels.



(a) Use the graph to complete the sentences below.

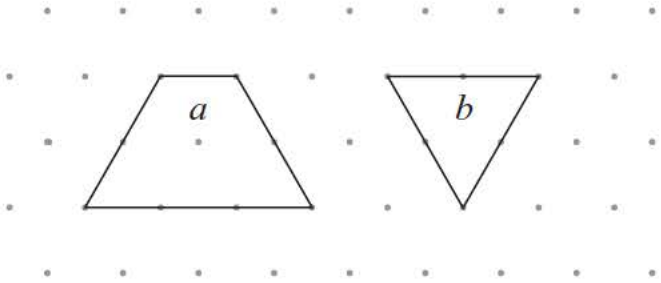
The company charges exactly £ _____ for parcels up to _____ kg. _____ 1 mark

Then for **each** extra kilogram the company charges another _____. _____ 1 mark

(b) Altogether, how much would the company charge to deliver two parcels, one of **15 kg** and one of **37 kg**?

£ _____ 1 mark

18. The diagram below shows a trapezium and an equilateral triangle.



Isometric grid

The **trapezium** has area a

The **triangle** has area b

(a) On the grid below, draw a shape with area $a + 2b$

1 mark

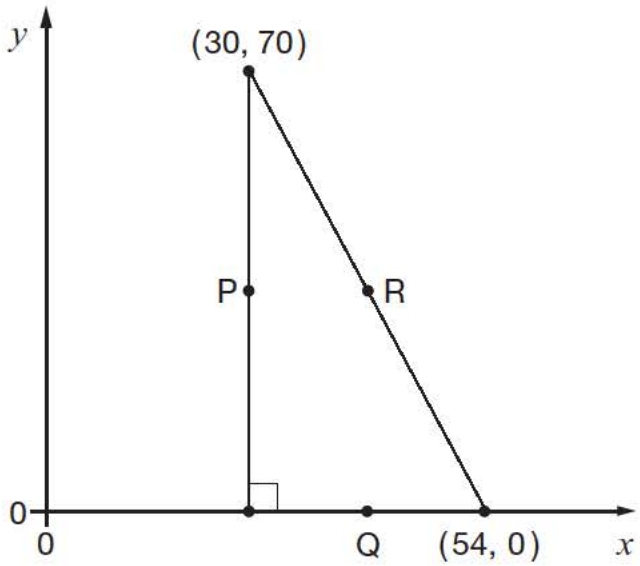
Isometric grid

(b) On the grid below, draw a shape with area $a - b$

1 mark

Isometric grid

19. The diagram shows a right-angled triangle.



Not drawn accurately

P, Q and R are the **midpoints** of the sides of the triangle.

Work out the coordinates of P, Q and R.

P is (_____ , _____) 1 mark

Q is (_____ , _____) 1 mark

R is (_____ , _____) 1 mark

20. The table shows information about the rainfall in two places in South America.

Place	Season	Mean rainfall	Number of months	Months
A	Dry	10 cm per month	8	Jan to Aug
	Wet	20 cm per month	4	Sept to Dec
B	Dry	5 cm per month	10	July to Apr
	Wet	50 cm per month	2	May to June

Which of the places has **more rainfall** on average over the whole year?

Show working to explain your answer.

Tick (✓) your answer.

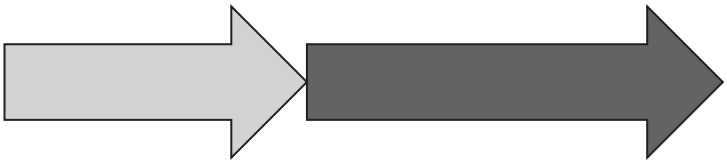
☐ A ☐ B

2 marks

21. The distance needed for a car to stop depends on how fast the car is travelling.

This distance can be calculated by adding the thinking distance and the braking distance.

For example: at **30 miles per hour**



30 feet	+	45 feet	=	75 feet
thinking distance		**braking distance**		**total stopping distance**

Here are the formulae to work out the thinking distance and the braking distance for a car travelling at V miles per hour.

Thinking distance = V feet Braking distance = $\frac{V^2}{20}$ feet

(a) A car is travelling at **70 miles per hour**.

What is the **total stopping distance** for this car?

_____ feet

2 marks

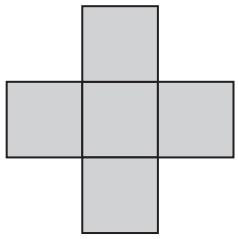
(b) A different car is travelling so that its **braking distance** is **125 feet**.

How fast is the car travelling?

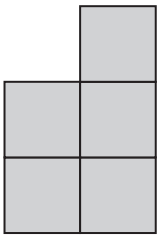
_____ miles per hour

1 mark

22. Shape A and shape B are each made from five identical squares.



A



B

Not drawn accurately

The **perimeter** of shape A is **72cm**.

Work out the **perimeter** of shape B.

_____ cm

2 marks

23. In one year, **2 million tonnes** of glass bottles and jars were thrown away in the UK.

38% of these bottles and jars were recycled.

How many tonnes of the bottles and jars were recycled?

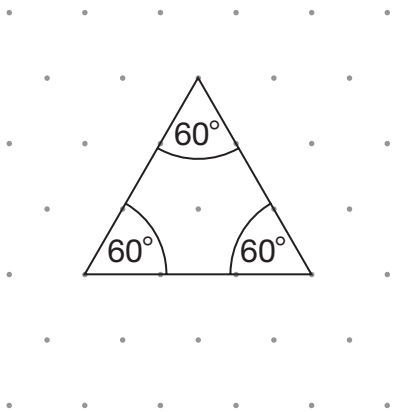
_____ tonnes

2 marks

24. (a) Look at the equilateral triangle.

Each angle in an equilateral triangle is 60°

Explain why.

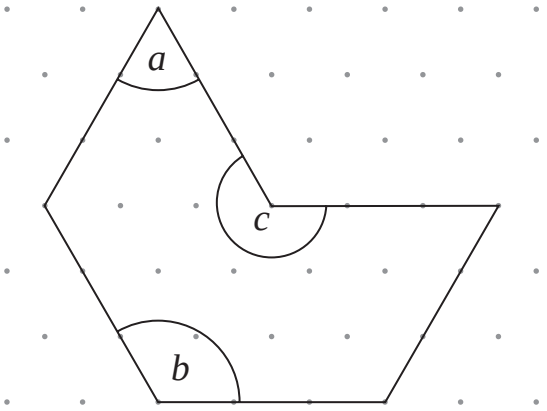


Isometric grid

1 mark

(b) Now look at this shape.

Work out the sizes of angles a, b and c



Isometric grid

a = _____ ° b = _____ ° c = _____ °

2 marks

25. A teacher has five bags containing only red and blue counters.

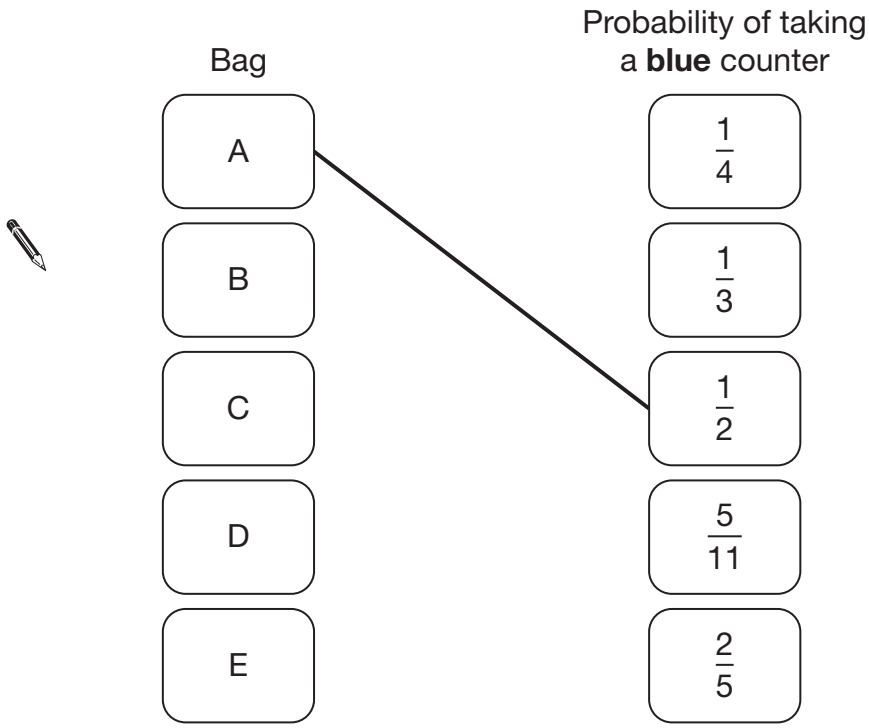
The table shows how many red and blue counters are in each bag.

	Bag				
	A	B	C	D	E
Red counters	6	6	6	6	6
Blue counters	6	5	4	3	2

The teacher is going to take a counter at random from each bag.

Match each bag with the correct probability of taking a **blue** counter below.

The first one is done for you.



2 marks

26. In a survey, pupils were asked if they owned a bicycle.

Results:

$\frac{3}{8}$ of the pupils said '**Yes**'.

$\frac{5}{8}$ of the pupils said '**No**'.

46 more pupils said 'No' than said 'Yes'.

Altogether, how many pupils were in the survey?

2 marks

END OF TEST

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