

Ma

KEY STAGE

3

TIER

4–6

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.

2009

TOTAL MARKS	
-------------	--

Instructions

Answers



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

Calculators



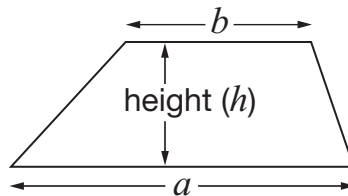
You **may** use a calculator to answer any question in this test.

Formulae

You might need to use these formulae

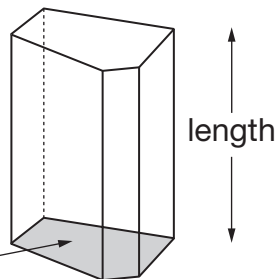
Trapezium

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



Prism

area of cross-section

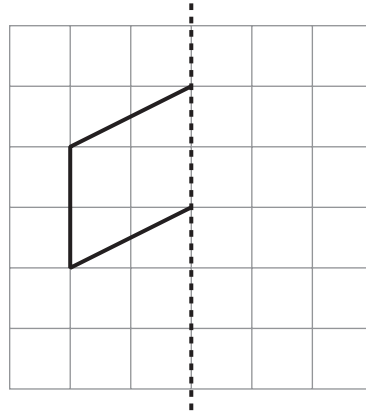


$$\text{Volume} = \text{area of cross-section} \times \text{length}$$

1. The diagrams in this question are drawn on square grids.
Reflect the shapes in the mirror lines.



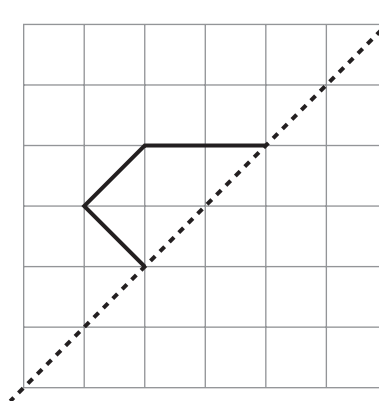
Mirror line



1 mark



Mirror line



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?

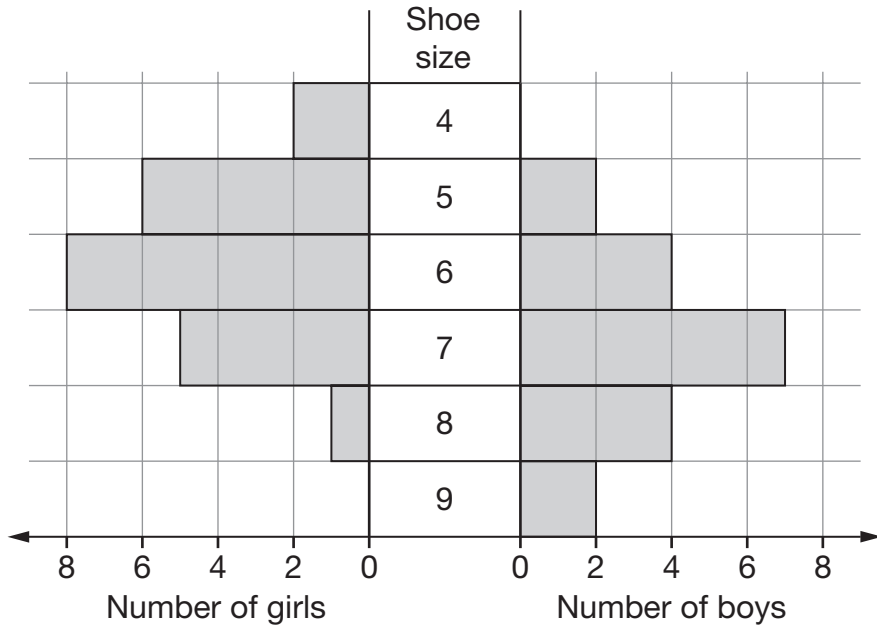


2 marks

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

$$694 + 396 + x = 1742$$



$x = \underline{\hspace{2cm}}$

1 mark

$$y \div 13 = 34$$



$y = \underline{\hspace{2cm}}$

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.

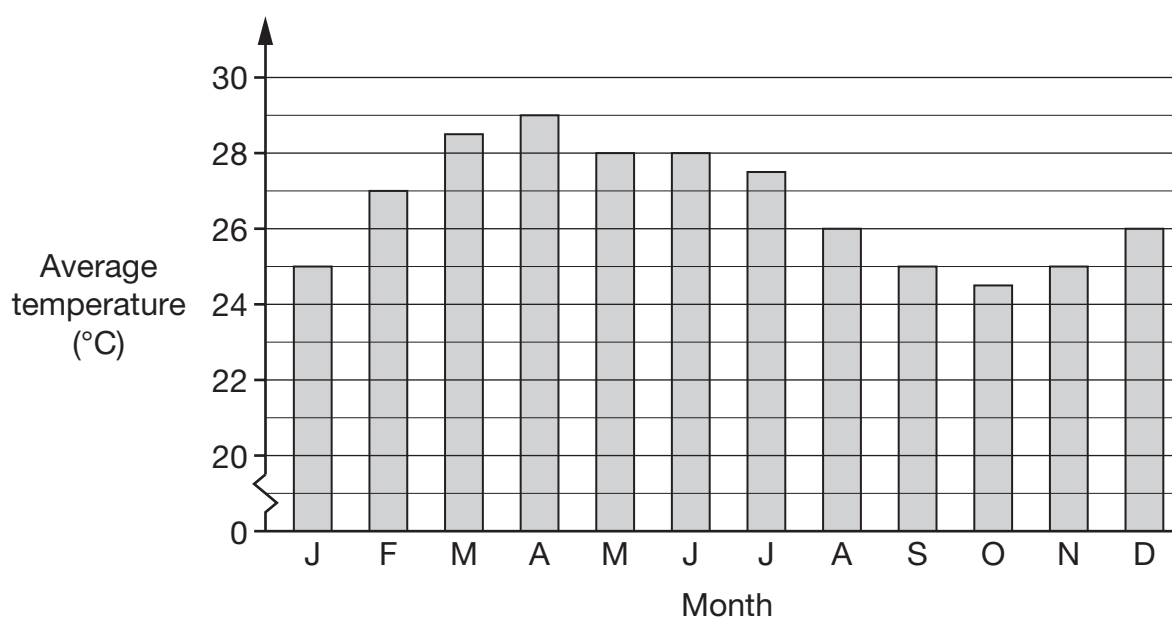
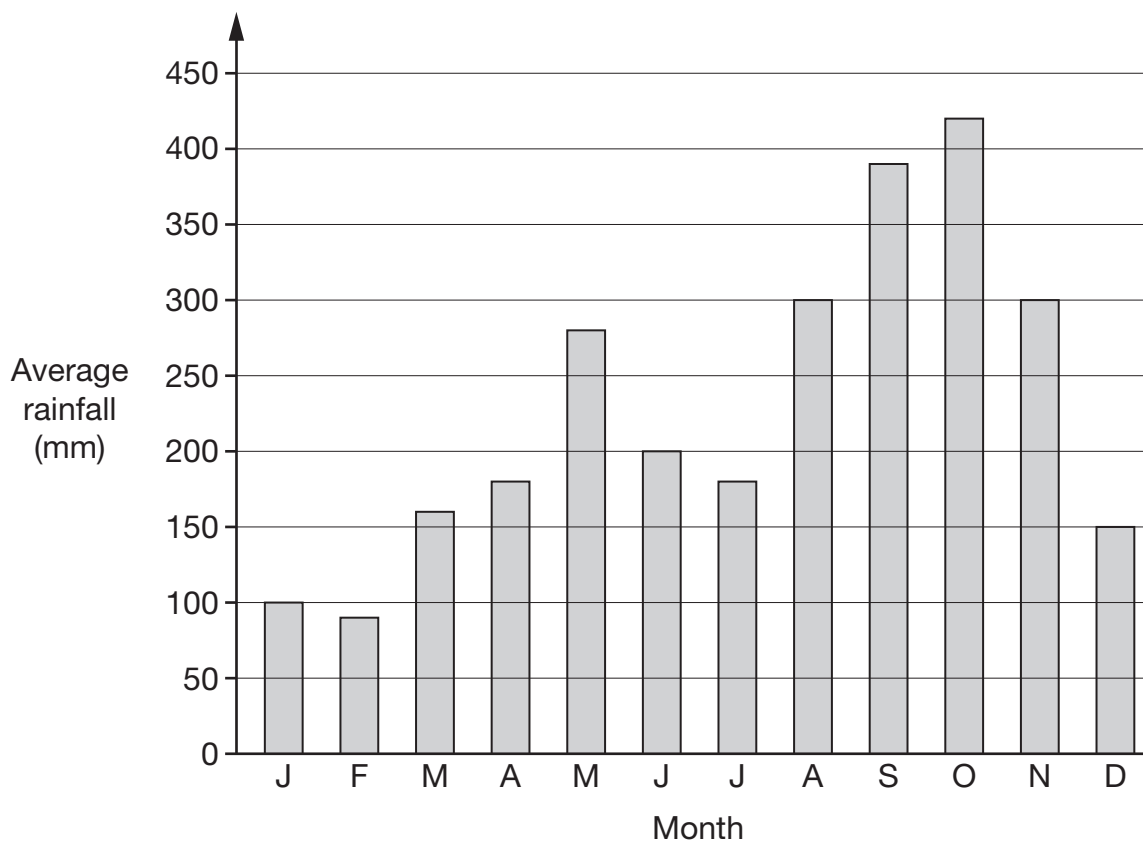


	Length	Area	Volume	Mass
Centimetres	✓			
Litres				
Miles				
Grams				
Square metres				
Ounces				

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

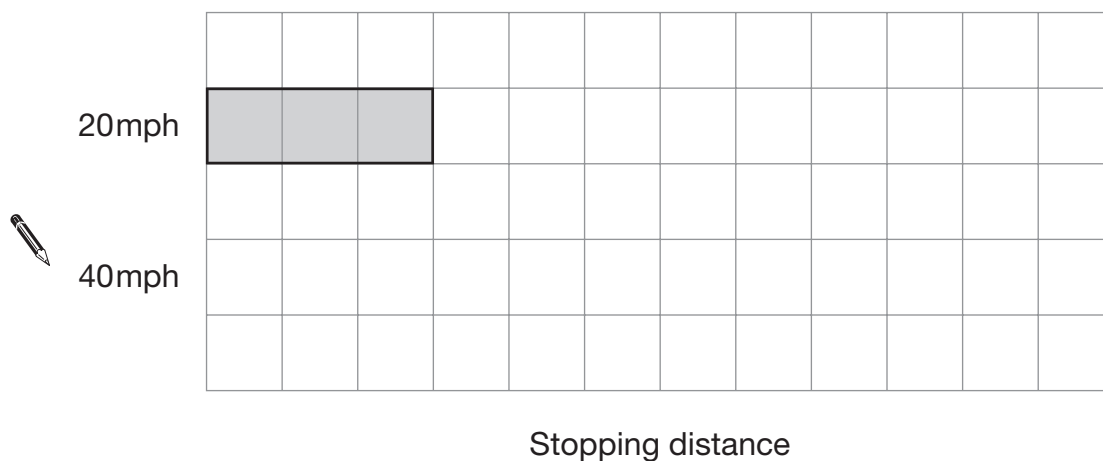
13. The table shows the stopping distances for a car at different speeds.

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

- (a) Look at the square grid below.

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

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



1 mark

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

How many squares long should the bar be?



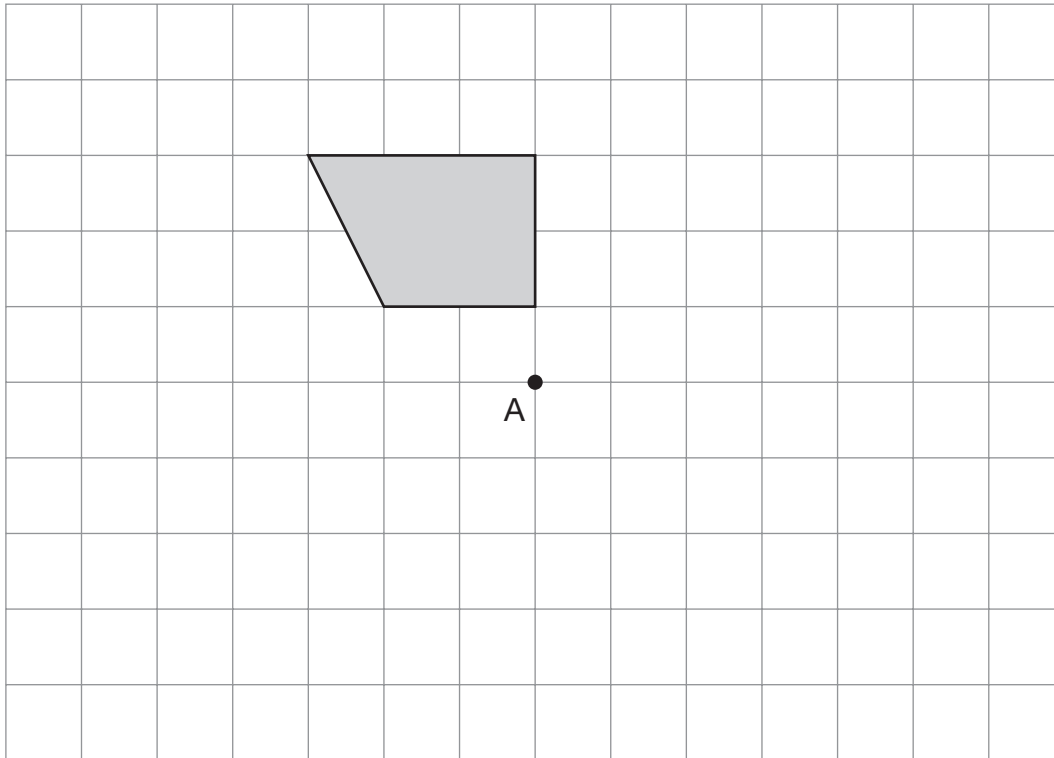
1 mark



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.

$$a + b = \underline{35}$$



$$ab = \underline{\hspace{2cm}}$$

1 mark



$$\frac{b}{a} = \underline{\hspace{2cm}}$$

1 mark



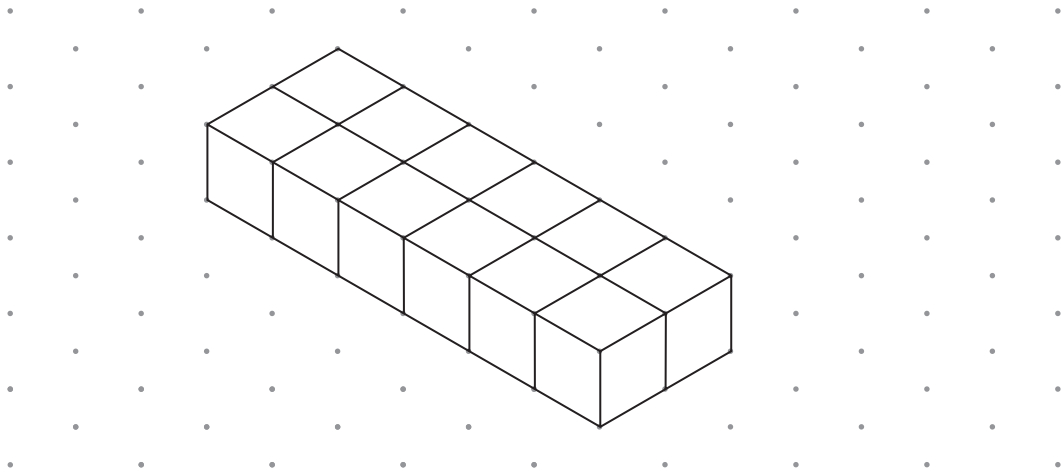
$$(a + b)^2 = \underline{\hspace{2cm}}$$

1 mark



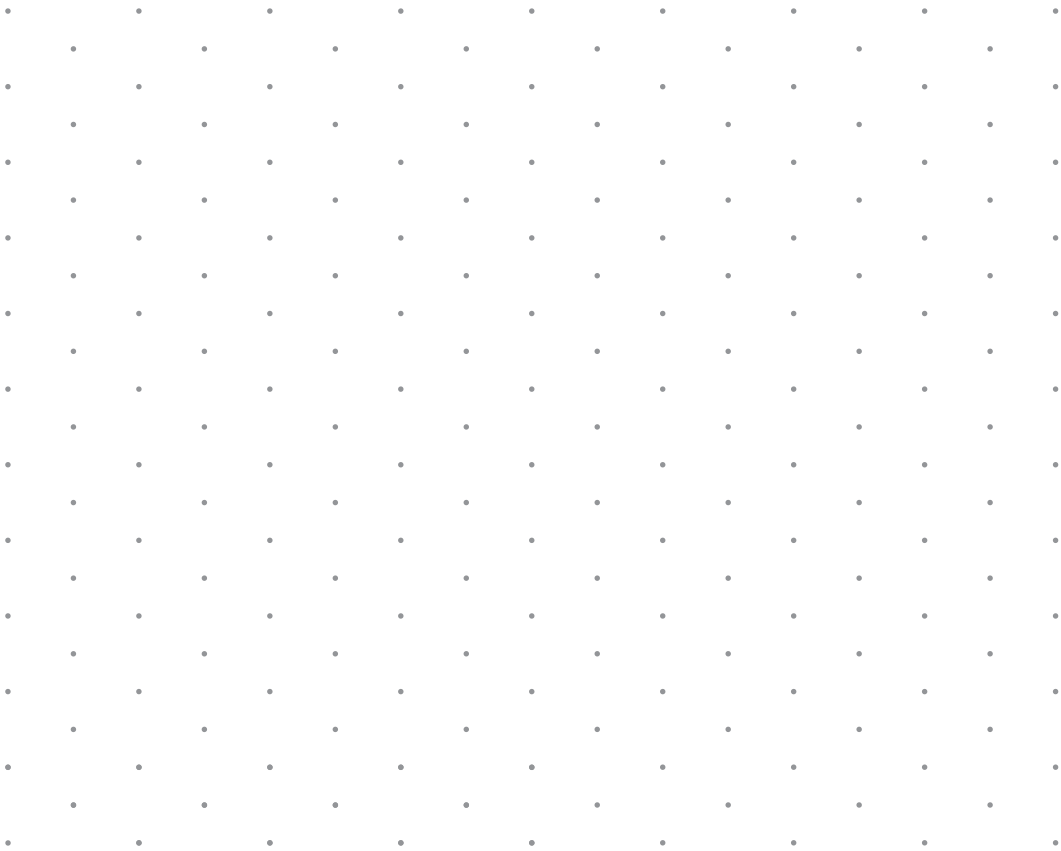
16. Look at the cuboid drawn on the grid.

It is made from **12 cubes**.



Isometric grid

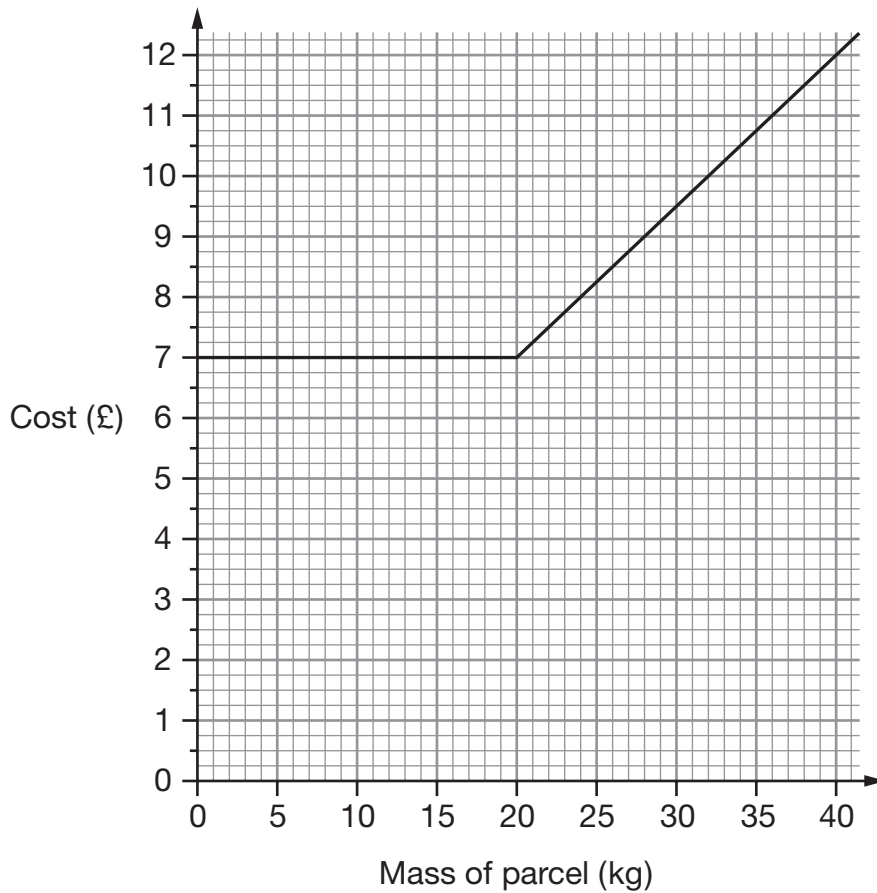
On the grid below, draw a **different** cuboid made from 12 cubes.



Isometric grid

2 marks

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 **15kg** and one of **37kg**?

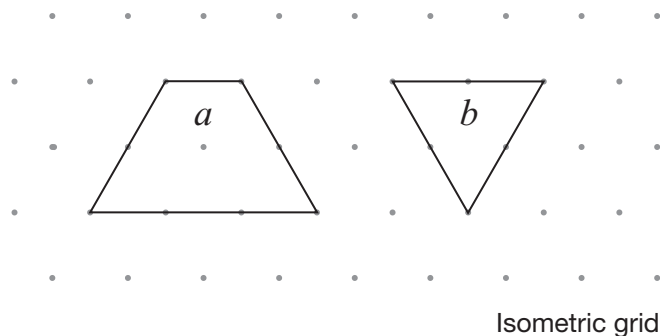


£

_____ 1 mark



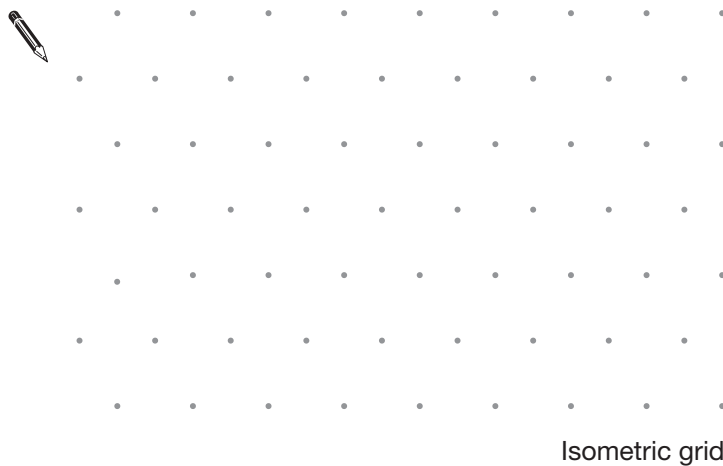
18. The diagram below shows a trapezium and an equilateral triangle.



The **trapezium** has area a

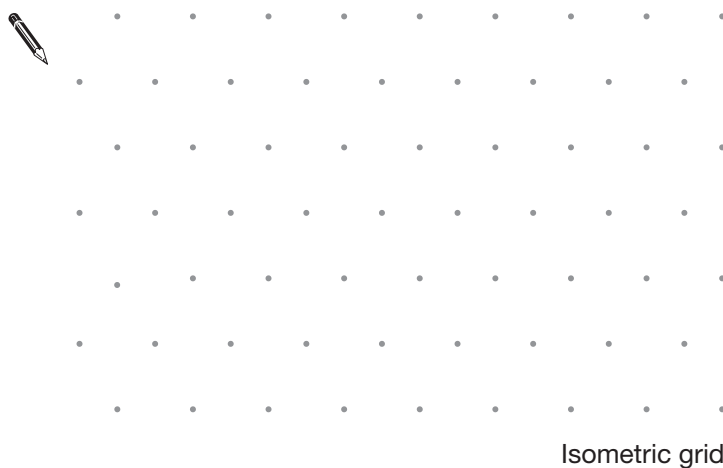
The **triangle** has area b

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



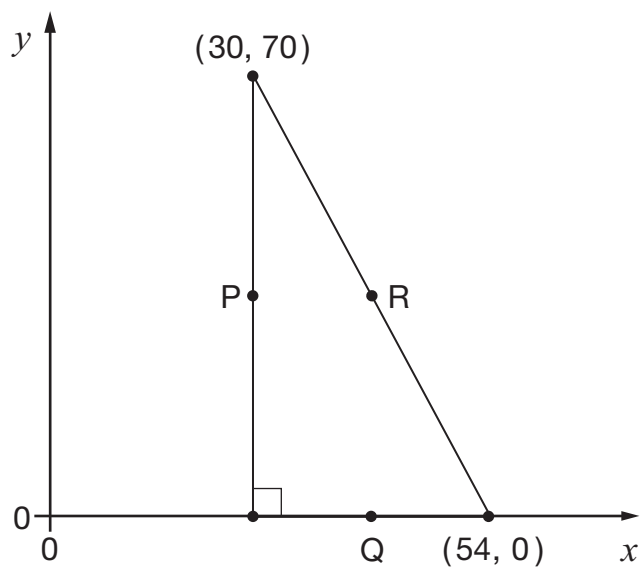
1 mark

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



1 mark

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	10cm per month	8	Jan to Aug
	Wet	20cm per month	4	Sept to Dec
B	Dry	5cm per month	10	July to Apr
	Wet	50cm 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.



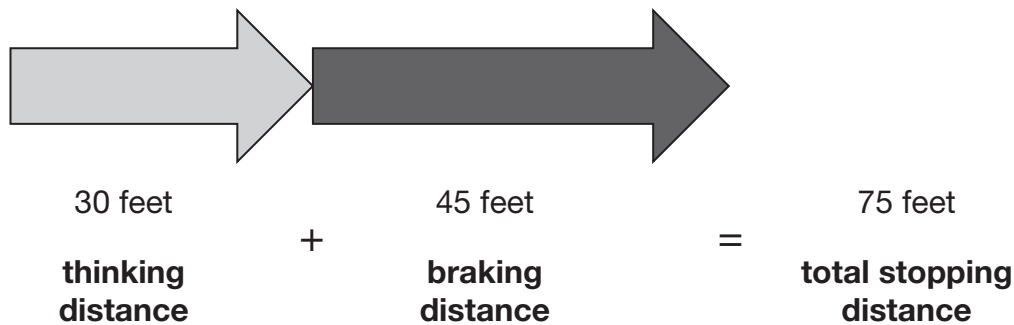
Tick (✓) your answer.

 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**



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

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

- (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?

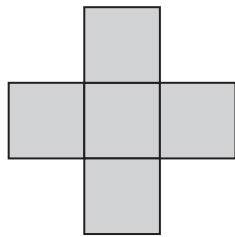


_____ miles per hour

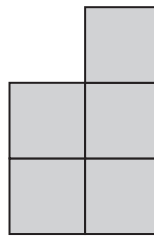
1 mark



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?



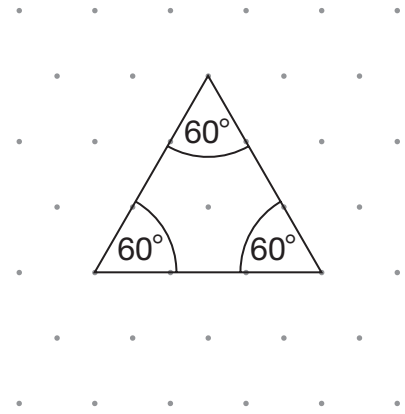
_____ tonnes

 2 marks

24. (a) Look at the equilateral triangle.

Each angle in an equilateral triangle is 60°

Explain why.

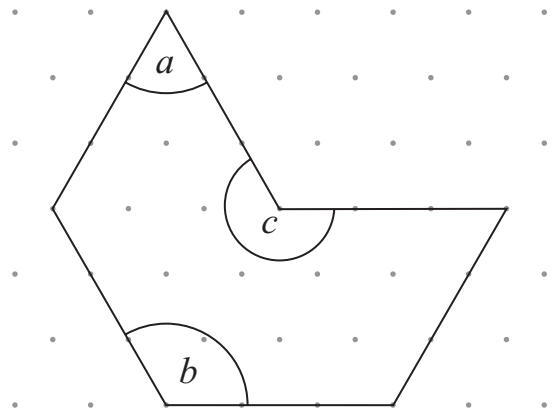


Isometric grid

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.

Bag	Probability of taking a blue counter
A	$\frac{1}{4}$
B	$\frac{1}{3}$
C	$\frac{1}{2}$
D	$\frac{5}{11}$
E	$\frac{2}{5}$



A line connects Bag A to the probability $\frac{1}{2}$.

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