Mathematics test

Paper 2

Calculator allowed

Please read this page, but do not open the booklet until your teacher tells you to start. Write your name and the name of your school in the spaces below. If you have been given a pupil number, write that also.

First name _____

Last name _____

School _____

Pupil number | | | | | | |

Remember

- The test is 1 hour long.
- You may use a calculator in this test.
- You will need: pen, pencil, rubber, ruler, a pair of compasses, an angle measurer or protractor and a scientific or graphic calculator.
- Some formulae you might need are on page 3.
- 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.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marker's use only		
	Total marks	
	Borderline check	

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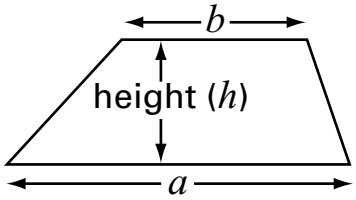
Answers

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

Calculators

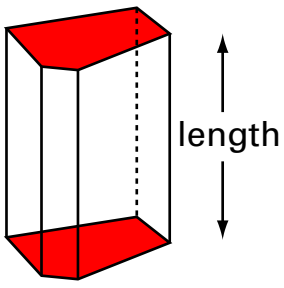
You **may** use a calculator to answer any question in this test.

Trapezium



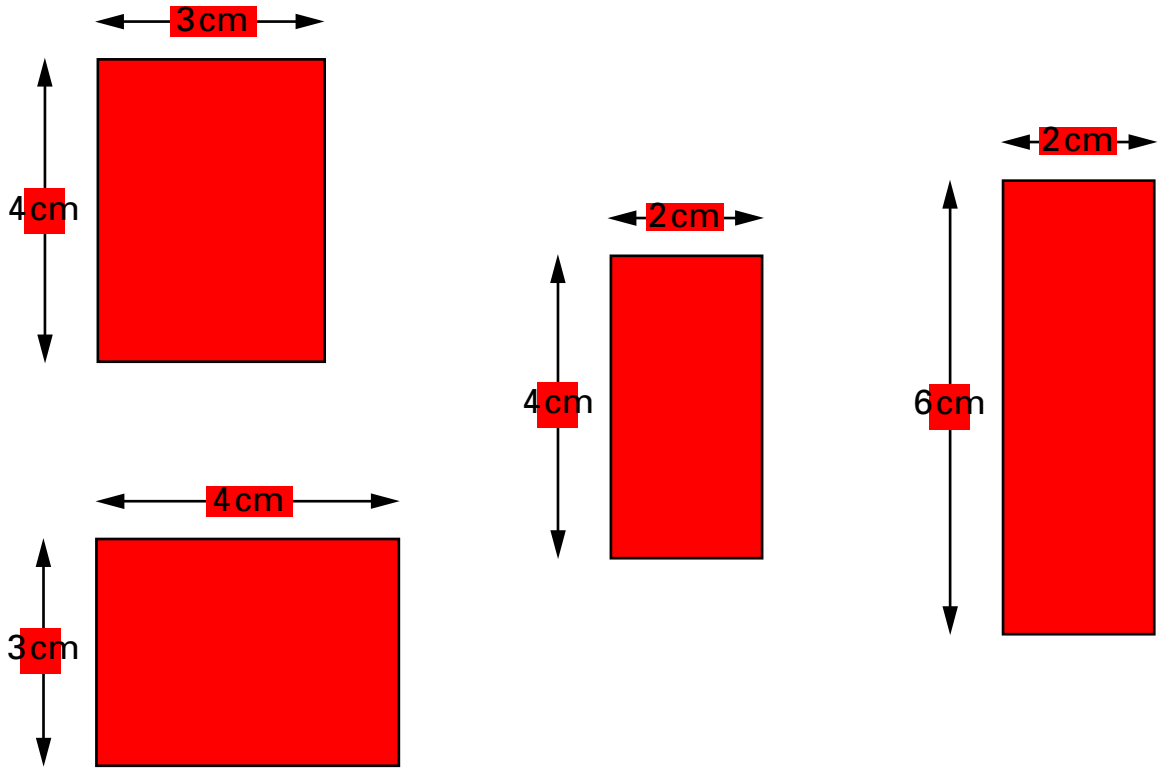
$$\text{Area} = \frac{(a + b)}{2} \times h$$

Prism



Volume = area of cross-section × length

1. (a) Tick (✓) any rectangles below that have an **area** of **12** cm^2



. . . .
1 mark

(b) A **square** has an area of **100** cm^2

What is its **perimeter**?

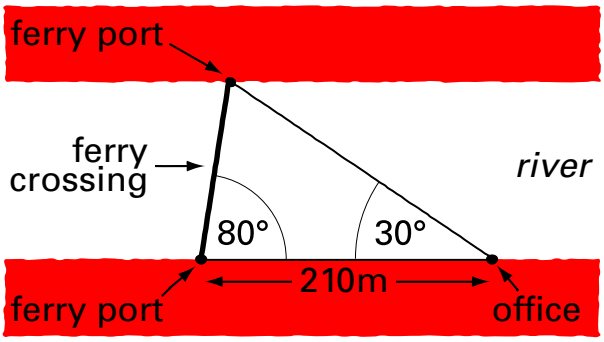
Show your working.

. . . .

. . . . . cm

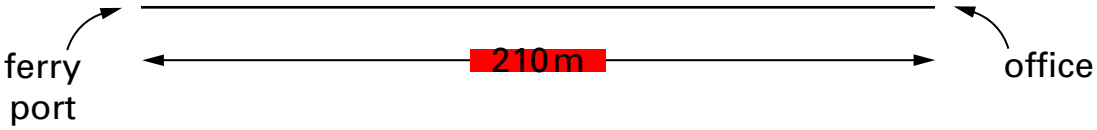
. . . .
2 marks

2. Here is a plan of a ferry crossing.



Not drawn accurately

(a) Complete the accurate scale drawing of the ferry crossing below.



. . . . .

. . . . .

2 marks

(b) What is the length of the ferry crossing on **your** diagram?

cm

. . . . .

1 mark

(c) The scale is **1 cm** to **20 m**. Work out the length of the real ferry crossing.

Show your working, and **write the units with your answer**.

. . . . .

. . . . .

2 marks

3. (a) You pay **£2.40** each time you go swimming.

Complete the table.

Number of swims	0	10	20	30
Total cost (£)	0	24		

. . . .
1 mark

(b) Now show this information on the graph on the page opposite.
Join the points with a straight line.

. . . .

. . . .
2 marks

(c) A different way of paying is to pay a yearly fee of **£22**
Then you pay **£1.40** each time you go swimming.

Complete the table.

Number of swims	0	10	20	30
Total cost (£)	22	36		

. . . .
1 mark

(d) Now show this information on the same graph.
Join these points with a straight line.

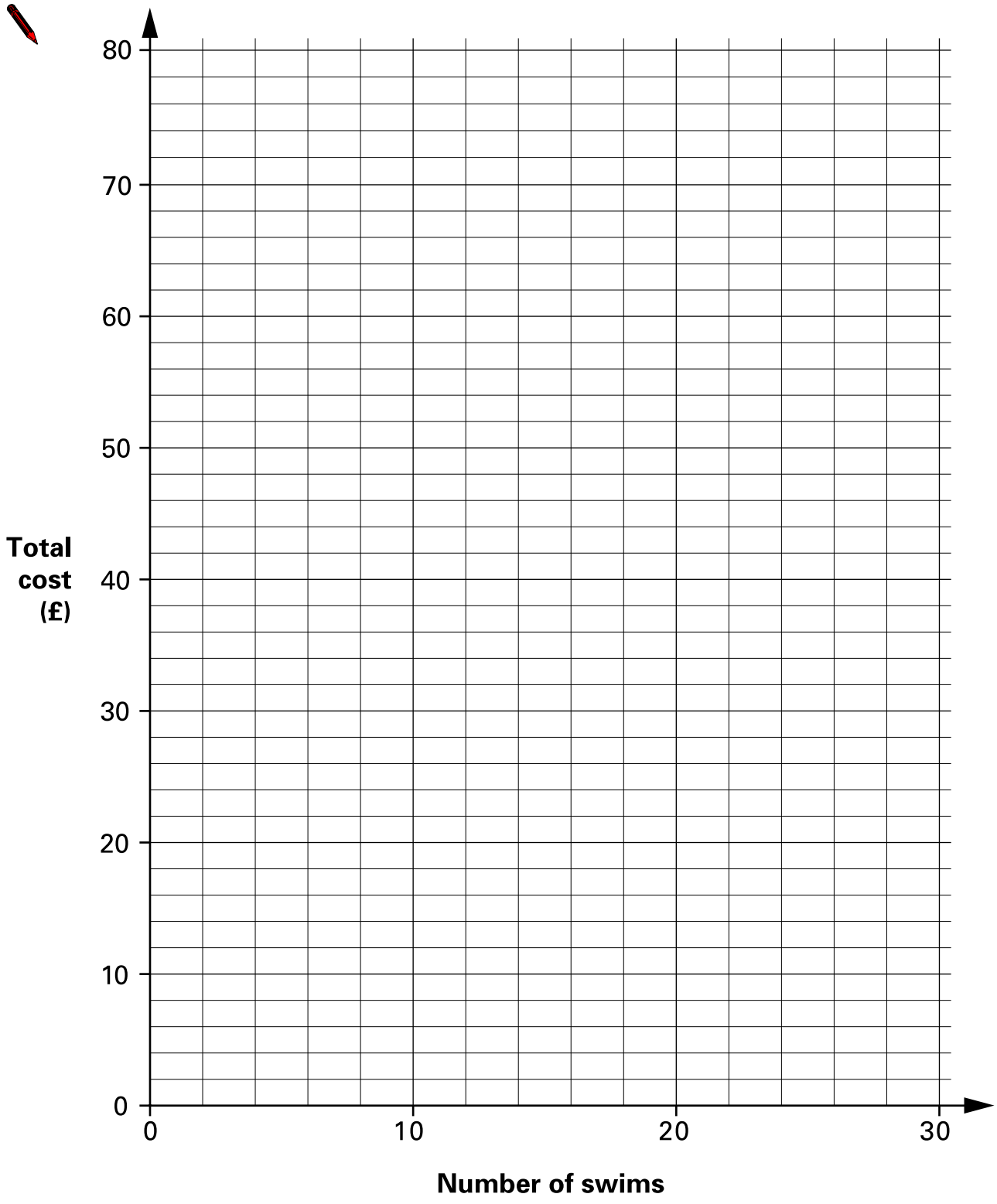
. . . .

. . . .
2 marks

(e) For **how many swims** does the graph show that the cost is the **same** for both ways of paying?

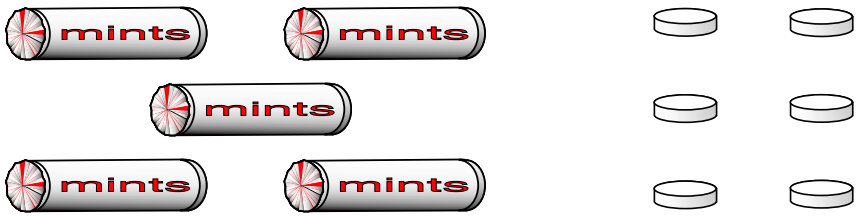
. . . . . .

. . . .
1 mark


80
70
60
50
40
30
20
10
0
Total cost (£)
0
10
20
30
Number of swims

4. A teacher has **5 full packets** of mints and **6 single** mints.

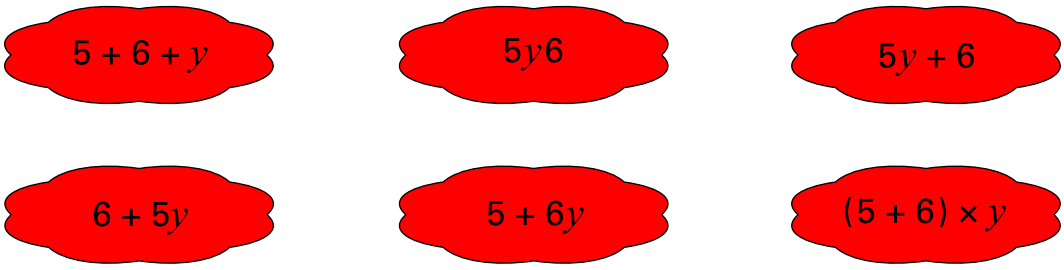
The number of mints inside each packet is the same.



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

5. A drink from a machine costs **55p**

The table shows the coins that were put into the machine one day.

Coins	Number of coins
50p	31
20p	22
10p	41
5p	59

How many cans of drink were sold that day?

Show your working.

. . . . .

. . . . .

. . . . . cans

. . . . .

3 marks

6. You can work out the cost of an advert in a newspaper by using this formula:

$$C = 15n + 75$$

C is the cost in pounds
n is the number of words in the advert

(a) An advert has **18 words**.

Work out the cost of the advert.

Show your working.

£ . . . . .

. . . . .
2 marks

(b) The cost of an advert is **£615**

How many words are in the advert?

Show your working.

. . . . . words . . . . .
2 marks

7. (a) A coach travels **300 miles** at an average speed of **40 mph**.

For how many hours does the coach travel?

. . . . . hours

1 mark

(b) An aeroplane flies **1860 miles** in **4 hours**.

What is its average speed?

. . . . . mph

1 mark

(c) A bus travels for $\mathbf{2\frac{1}{2}}$ **hours** at an average speed of **24 mph**.

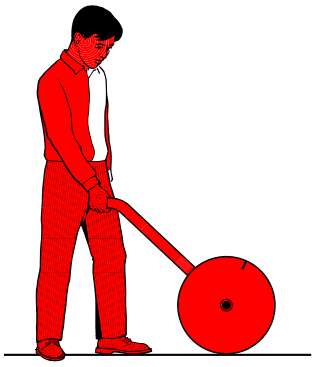
How far does the bus travel?

. . . . . miles

1 mark

8. A trundle wheel is used to measure distances.

Imran makes a trundle wheel, of **diameter 50 cm**.



(a) Calculate the **circumference** of Imran's trundle wheel.

Show your working.

. . . . .

. . . . . cm . . . . .

2 marks

(b) Imran uses his trundle wheel to measure the length of the school car park.

His trundle wheel rotates **87 times**.

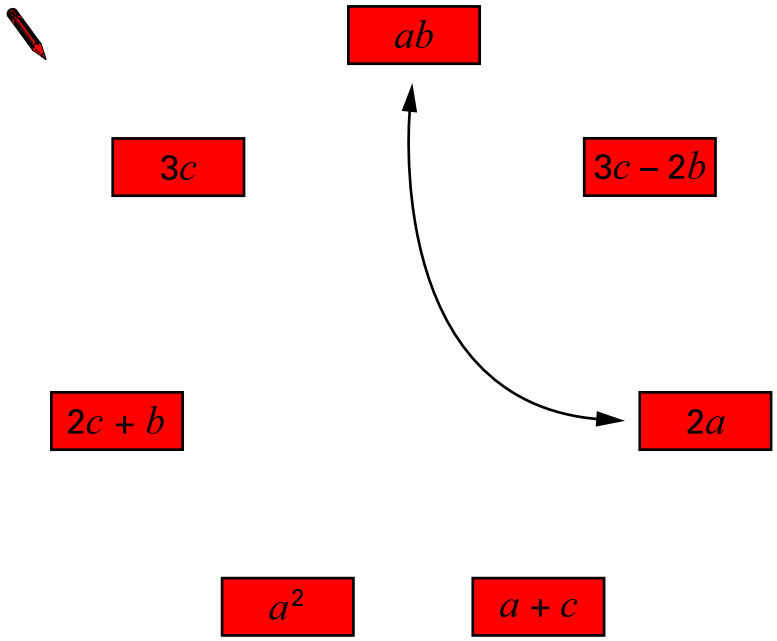
What is the **length** of the car park, to the **nearest metre**?

. . . . . m . . . . .

1 mark

9. (a) Join pairs of algebraic expressions that have the **same value** when $a = 3$, $b = 2$ and $c = 6$

One pair is joined for you.

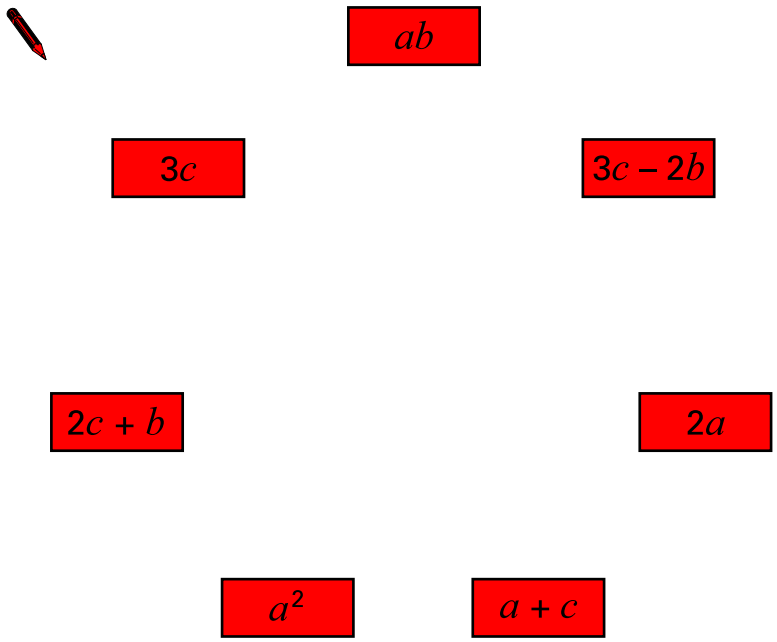


. . . .

. . . .

2 marks

(b) Draw lines to join any pairs that will always have the **same value** when $a = b = c$



. . . .

. . . .

. . . .

3 marks

10. A teacher asked two different classes:

'What type of book is your favourite?'

(a) Results from **class A** (total 20 pupils):

Type of book	Frequency
Crime	3
Non-fiction	13
Fantasy	4

Complete the pie chart to show this information.
Show your working and draw your angles accurately.

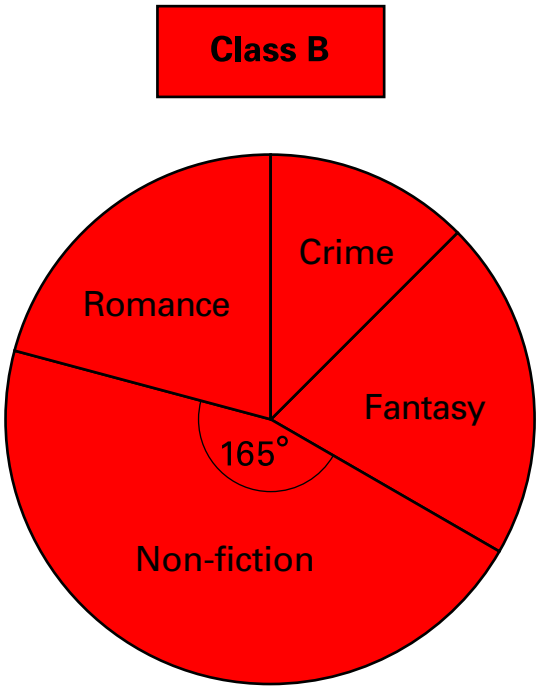
. . . .

. . . .

2 marks

(b) The pie chart below shows the results from all of **class B.**

Each pupil had only one vote.



The sector for **Non-fiction** represents **11 pupils**.

How many pupils are in class B?

Show your working.

. . . . .

. . . . . pupils

. . . . .

2 marks

11. (a) The label on yoghurt A shows this information.

Yoghurt A **125 g**	
Each 125 g provides	
Energy	430 kJ
Protein	4.5 g
Carbohydrate	11.1 g
Fat	4.5 g

How many grams of **protein** does **100 g** of yoghurt provide?

Show your working.

. . . . . g

. . . . .
2 marks

(b) The label on yoghurt B shows different information.

Yoghurt B **150 g**	
Each 150 g provides	
Energy	339 kJ
Protein	6.6 g
Carbohydrate	13.1 g
Fat	0.2 g

A boy eats the same amount of yoghurt A and yoghurt B.

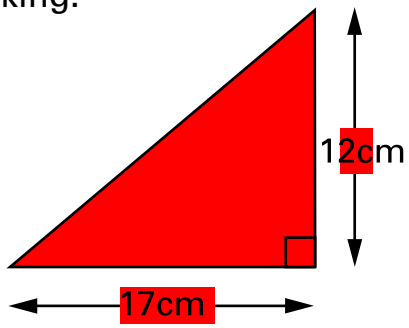
Which yoghurt provides him with more **carbohydrate**?

Show your working.

. . . . .

. . . . .
2 marks

12. (a) Calculate the length of the unknown side of this right-angled triangle.
Show your working.



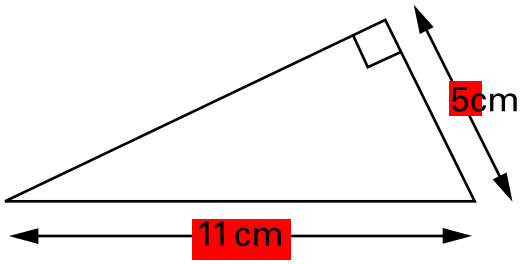
Not drawn accurately

. . . . .

. . . . . cm

. . . . .
2 marks

(b) Calculate the length of the unknown side of the right-angled triangle below.
Show your working.



Not drawn accurately

. . . . .

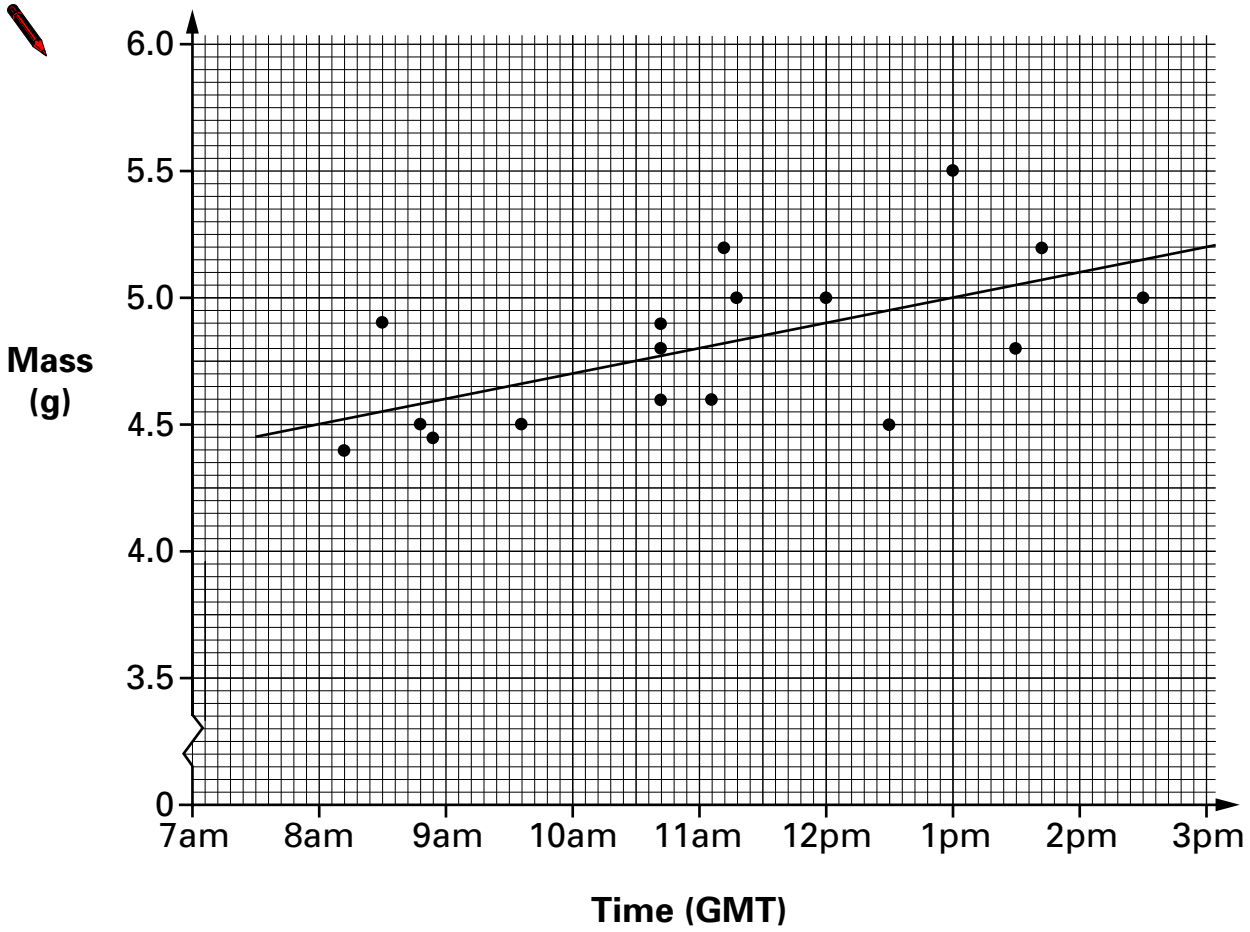
. . . . . cm

. . . . .
2 marks

13. The goldcrest is Britain's smallest species of bird.

On winter days, a goldcrest must eat enough food to keep it warm at night. During the day, the mass of the bird increases.

The scatter diagram shows the mass of goldcrests at different times during winter days. It also shows the line of best fit.



(a) Estimate the mass of a goldcrest at **11 : 30 am**.

. . . . . g

1 mark

(b) Estimate how many grams, on average, the mass of a goldcrest **increases** during **one hour**.

. . . . . g

. . . .
1 mark

(c) Which goldcrest represented on the scatter diagram is **least likely** to survive the night if it is cold?

Show your answer by circling the correct point on the scatter diagram, then explain why you chose that point.

. . . .
1 mark

14. (a) On the cm^2 grid below, draw a **right-angled triangle** with an area of **12 cm^2**
Use line AB as one side of the triangle.

1 mark

(b) Now draw an **isosceles triangle** with an area of **12 cm^2**
Use line AB as one side of the triangle.

1 mark

15. A gardener wants to plant a tree.

She wants it to be **more than 8 m** away from the **vegetable plot**.

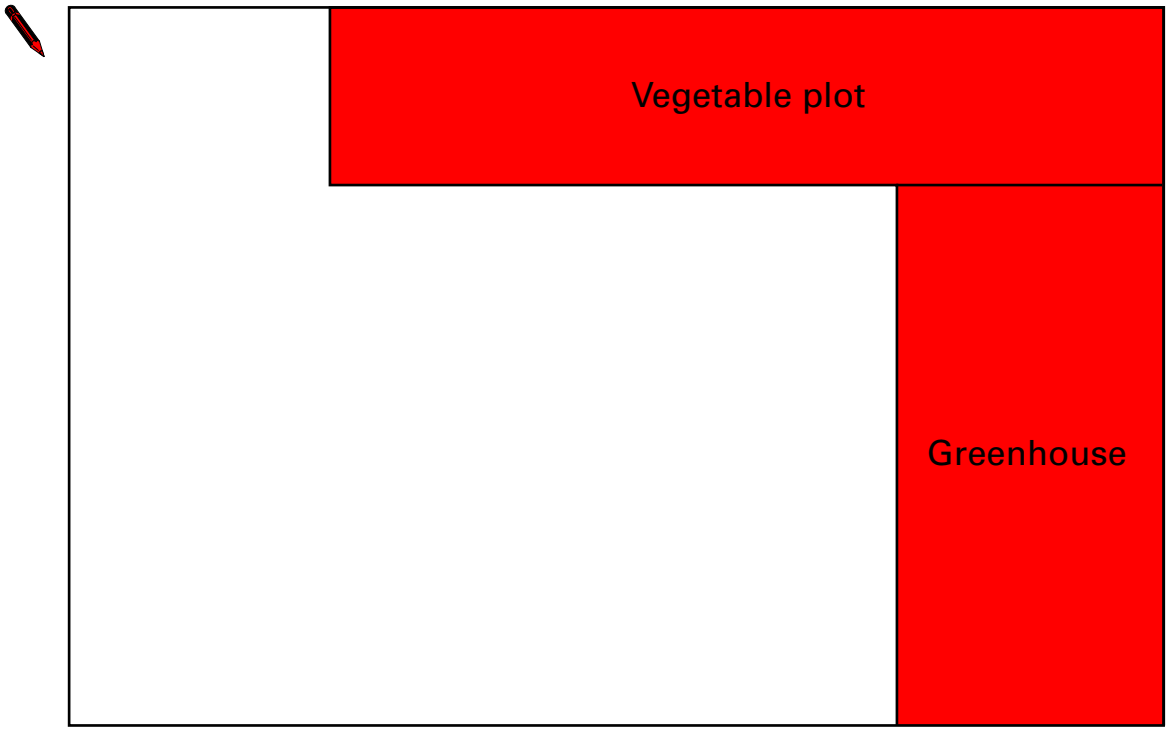
She wants it to be **more than 18 m** away from the **greenhouse**.

The plan below shows part of the garden.

The scale is **1 cm** to **4 m**.

Show **accurately** on the plan the region of the garden where she can plant the tree.

Label this region **R**.



. . . .

. . . .

. . . .

3 marks

16. The table shows the average weekly earnings for men and women in 1956 and 1998.

	1956	1998
Men	£11.89	£420.30
Women	£6.16	£303.70

(a) For **1956**, calculate the average weekly earnings for women as a percentage of the average weekly earnings for men.

Show your working and give your answer to 1 decimal place.

. . . . .

. . . . . %

. . . . .

2 marks

(b) For **1998**, show that the average weekly earnings for women were a **greater proportion** of the average weekly earnings for men than they were in 1956.

. . . . .

. . . . .

2 marks

END OF TEST

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