GCSE

3310U20-1

TUESDAY, 7 JUNE 2022 – MORNING

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

FOUNDATION TIER

1 hour 25 minutes plus your additional time allowance

A CALCULATOR WILL BE REQUIRED FOR THIS PAPER

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	4	
2.	3	
3.	10	
4.	5	
5.	3	
6.	7	
7.	3	
8.	4	
9.	7	
10.	9	
11.	5	
Total	60	

(Turn over)

ADDITIONAL MATERIALS

A ruler, a protractor and a pair of compasses may be required.

ITEMS INCLUDED WITH QUESTION PAPER

A separate Formula List.

A separate Diagram Booklet.

The Diagram Booklet MUST be handed in to the invigilators and sent for marking.

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball – point pen, black felt tip or your usual method.

Write your name, centre number and candidate number in the spaces on the front cover.

Answer ALL questions.

Write your answers in the spaces provided.

If you run out of space, use the additional page(s) at the back of the booklet. Question numbers must be given for the work written on the additional page(s).

Take π as 3·14 or use the π button on your calculator.

(Turn over)

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part – question.

In question 3 (c), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

(Turn over)

1. Simran buys 5 packets of sunflower seeds and 2 packets of cosmos seeds.

   The sunflower seeds cost a total of £9.30

   The total cost of all the packets of seeds that Simran buys is £13.80

   (a) How much does it cost for one packet of sunflower seeds?

[2 marks]

continued on the next page . . .

Question 1 continued

1. (b) How much does it cost for one packet of cosmos seeds?

[2 marks]

2. Most foods can be frozen and stored in a freezer.

Different freezers have different ‘freezer star ratings’.

Look at the table for Question 2 in the separate Diagram Booklet.

The table shows the temperatures of freezers with different star ratings. It also shows the maximum length of time that food should be stored in each type of freezer.

continued on the next page . . .

Question 2 continued

2. (a) What is the difference in temperature between a freezer with a 2 – star rating and a freezer with a 4 – star rating?

[1 mark]

continued on the next page . . .

Question 2 continued

2. (b) What star rating should a freezer have if it is to be used to store food for 16 weeks?

Circle your answer.

1 – star
2 – star
3 – star
4 – star

[1 mark]

continued on the next page . . .

Question 2 continued

2. (c) Eve usually freezes food in June to use in December.

She says:

> **It doesn't matter whether I buy a freezer with a 3 – star rating or one with a 4 – star rating.**

Do you agree?

Give a reason for your answer.

Yes ☐ **No** ☐

12

[1 mark]

3. Glyn is running a game stall at a village fête.

Each player who wins a game at the stall receives a prize.

These prizes are selected at random from those available.

Look at the diagram for Question 3 in the separate Diagram Booklet.
It is a vertical line diagram.

At the start of the fête, Glyn drew this vertical line diagram to show the number of each prize available.

continued on the next page . . .

Question 3 continued

3. (a) What is the modal prize available?

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 3 continued

3. (b) At the start of the fête, one player said:

> **There is an equal chance of winning a chocolate bar, a toy, a book or a photo frame.**

Do you agree?

Yes ☐ **No** ☐

Give a reason for your answer.

[1 mark]

continued on the next page . . .

Question 3 continued

3. (c) IN THIS PART OF THE QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.

Glyn bought all of the prizes for his stall from a shop. The number of each prize is shown in the vertical line diagram.

continued on the next page . . .

Question 3 (c) continued

The cost of buying ONE of each prize is shown in the table below.

Chocolate bar	£1.80
Toy	£2.30
Book	£3.20
Photo frame	£4.70

Glyn received a discount of 10% off the total cost of all the prizes.

continued on the next page . . .

Question 3 (c) continued

How much did Glyn pay for

ALL THE PRIZES at his stall?

You must show all your working.

(Turn over)

[6 marks + 2 marks OCW]

(Turn over)

4. Look at the diagram for Question 4 in the separate Diagram Booklet.

A business is having a large glass logo made. The diagram shows the outline of the logo drawn to scale on a grid.

Each square on the grid represents an area of 0•5 m^2

The cost of the glass for the logo is £290 per m^2

Calculate an estimate of the total cost of the glass for the logo.

Total cost of the glass for the

logo = _____

[5 marks]

(Turn over)

5. Shaun is working on a project about the surface area of the Earth's oceans.

He finds the following information about the proportion of the total surface area that is covered by each ocean.

OCEAN	PROPORTION
Pacific	47%
Indian	0·2
Southern	5%
Arctic	0·03
Atlantic	$\frac{1}{4}$

continued on the next page . . .

Question 5 continued

Complete the table provided for Question 5 in the separate Diagram Booklet to list the oceans in order of their surface area, starting with the largest.

The first line has been completed for you.

You must show how you decided on the order.

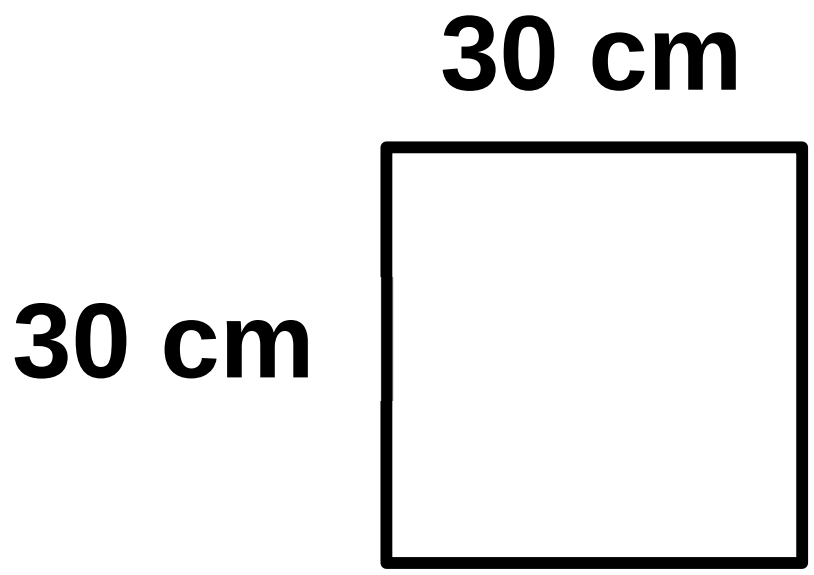
[3 marks]

6. Ann is designing her kitchen.

(a) Ann wants to place ceramic tiles on the floor in part of her kitchen.

She uses the tiles shown below.

The diagram is NOT drawn to scale.



continued on the next page . . .

Question 6 (a) continued

Look at Diagram 1 and Diagram 2 for Question 6 (a) in the separate Diagram Booklet.

The diagrams are NOT drawn to scale.

Ann's design is shown in Diagram 1.

The tiles are to be laid with a 1 cm gap between them.

Ann wants to place a thin metallic border along the edges of the tiles, as shown in Diagram 2.

continued on the next page . . .

Question 6 (a) continued

Calculate the total length of the metallic border.

Give your answer in metres.

[4 marks]

continued on the next page . . .

Question 6 continued

6. (b) Look at the diagram for Question 6 (b) in the separate Diagram Booklet. The diagram is NOT drawn to scale.

Ann wants a rectangular mat by her kitchen door.
The diagram shows a sketch of the mat that she wants.

What is the area of the mat?

State the units of your answer.

[3 marks]

7. Look at the diagram for Question 7 in the separate Diagram Booklet.
The diagram is a travel graph.

The travel graph shows a journey Luke made on Saturday along a straight road.

(a) How far away from home was Luke at 17:00?

_____

_____

_____

_____ km

[1 mark]

continued on the next page . . .

Question 7 continued

7. (b) For what length of time was Luke away from home on this journey?

Circle your answer.

$17\frac{1}{2}$ hours	$7\frac{1}{2}$ hours
$4\frac{1}{2}$ hours	$4\frac{3}{4}$ hours
$7\frac{1}{4}$ hours	

[1 mark]

Question 7 continued

7. (c) During his journey, Luke visited a friend's house.

He stopped for an hour and then continued his journey.

How far from Luke's home does his friend live?

_____ **km**

[1 mark]

8. (a) Lewis has been told by his doctor to eat 2400 calories per day.

He has been told to eat 35% of these calories at breakfast.

Lewis's breakfast on Tuesday had a total of 860 calories.

By how many calories did his breakfast on Tuesday exceed the amount he should have eaten?

You must show all your working.

(Turn over)

[3 marks]

continued on the next page . . .

Question 8 continued

8. (b) Look at the information for Question 8 (b) in the separate Diagram Booklet.

The information shown is stated on the packet of breakfast cereal.

Express, in its simplest terms, the ratio Carbohydrates : Protein.

[1 mark]

9. Look at the table for Question 9 in the separate Diagram Booklet.

After taking her meter reading, Alys always works out her electricity bill. She has created this table to fill in.

Complete Alys's table to calculate her electricity bill.

[7 marks]

10. (a) Look at the diagrams for Question 10 (a) in the separate Diagram Booklet. The diagrams are NOT drawn to scale.

Esme has a pond and a flowerbed in her garden.
The pond is circular and the flowerbed is in the shape of a quadrilateral, as shown.

The diameter of the pond is 140 cm.

The perimeter of the pond and the perimeter of the flowerbed are equal.

continued on the next page . . .

Question 10 (a) continued

Esme needs to know the lengths of all the sides of her flowerbed.

Complete the following statement for Esme.

“The lengths of the sides of the flowerbed are 176 cm, 128 cm, 60 cm and _____ cm.”

You must show all your working.

(Turn over)

[4 marks]

continued on the next page . . .

Question 10 continued

10. (b) Look at the diagram for Question 10 (b) in the separate Diagram Booklet. The diagram is NOT drawn to scale.

Bill has a vegetable plot in his garden. It is in the shape of a trapezium, labelled *ABCD*.

In the diagram:

***AB* = 4•3 m**

***AD* = 2•5 m**

***DC* = 5•6 m**

The angles inside the trapezium at *A* and *D* are right angles.

continued on the next page . . .

Question 10 (b) continued

Fertiliser is sold in small bags.
Each bag contains enough
fertiliser to treat an area
of 0·9 m^2

A bag of fertiliser costs £1.15

How much will it cost Bill to
buy enough bags of fertiliser
to treat his vegetable plot?
You must show all your working.

(Turn over)

[5 marks]

11. Look at the diagram for Question 11 in the separate Diagram Booklet.
The diagram is a scatter diagram.

An engine normally runs at 100°C
When the engine runs at 110°C or more, a warning light comes on.

A section of the temperature chart for the engine, from 12:00 to 16:00, is shown on the scatter diagram.

continued on the next page . . .

Question 11 continued

11. (a) How often was the temperature of the engine recorded?

Circle your answer.

Every 5 minutes
Every 12 minutes
Every 15 minutes
Every $2\frac{1}{2}$ minutes
Every 30 minutes

[1 mark]

Question 11 continued

11. (b) At what time was it first recorded that the warning light had come on?

[1 mark]

continued on the next page . . .

Question 11 continued

11. (c) What was the range of the recorded temperatures of the engine between 12:00 and 16:00?

[1 mark]

continued on the next page . . .

Question 11 continued

11. (d) (i) Use the graph paper provided for Question 11 (d) (i) in the separate Diagram Booklet to plot the recorded temperature of the engine at 12:00, 13:00, 14:00, 15:00 and 16:00 only.

[1 mark]

continued on the next page . . .

Question 11 (d) continued

11. (d) (ii) Why is the graph you have drawn misleading?

[1 mark]

END OF PAPER

TOTAL 60 MARKS

Question number	Additional pages, if required. Write the question number(s) in the left - hand margin.

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The Diagram Booklet MUST be handed in to the invigilators and sent for marking.

Diagram Booklet

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

Question 2

Table

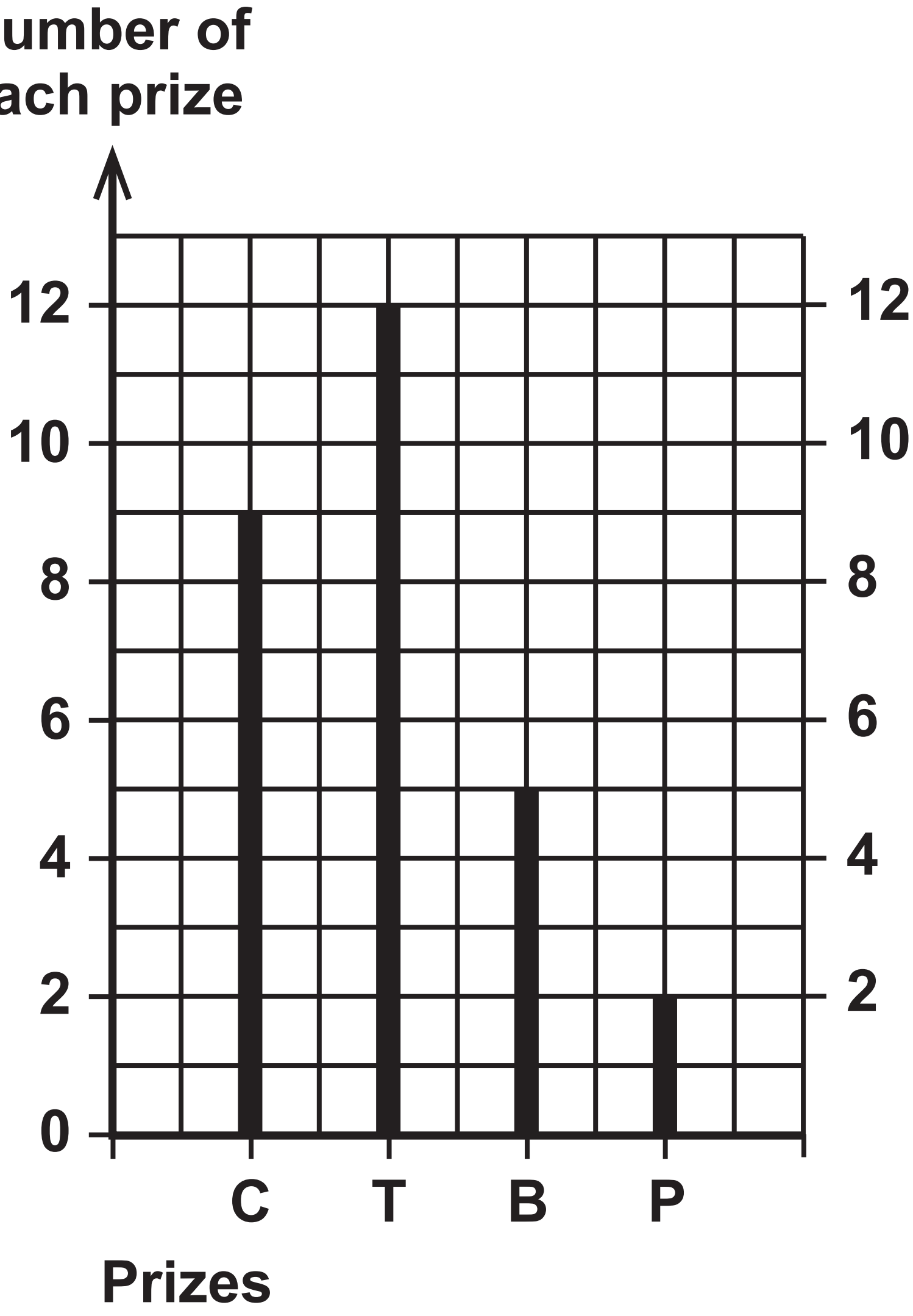
Freezer star rating	Freezer temperature	Maximum length of time food should be stored
****	–18°C	3 months or longer
***	–18°C	3 months
**	–12°C	1 month
*	–6°C	1 week

Question 3

Key:

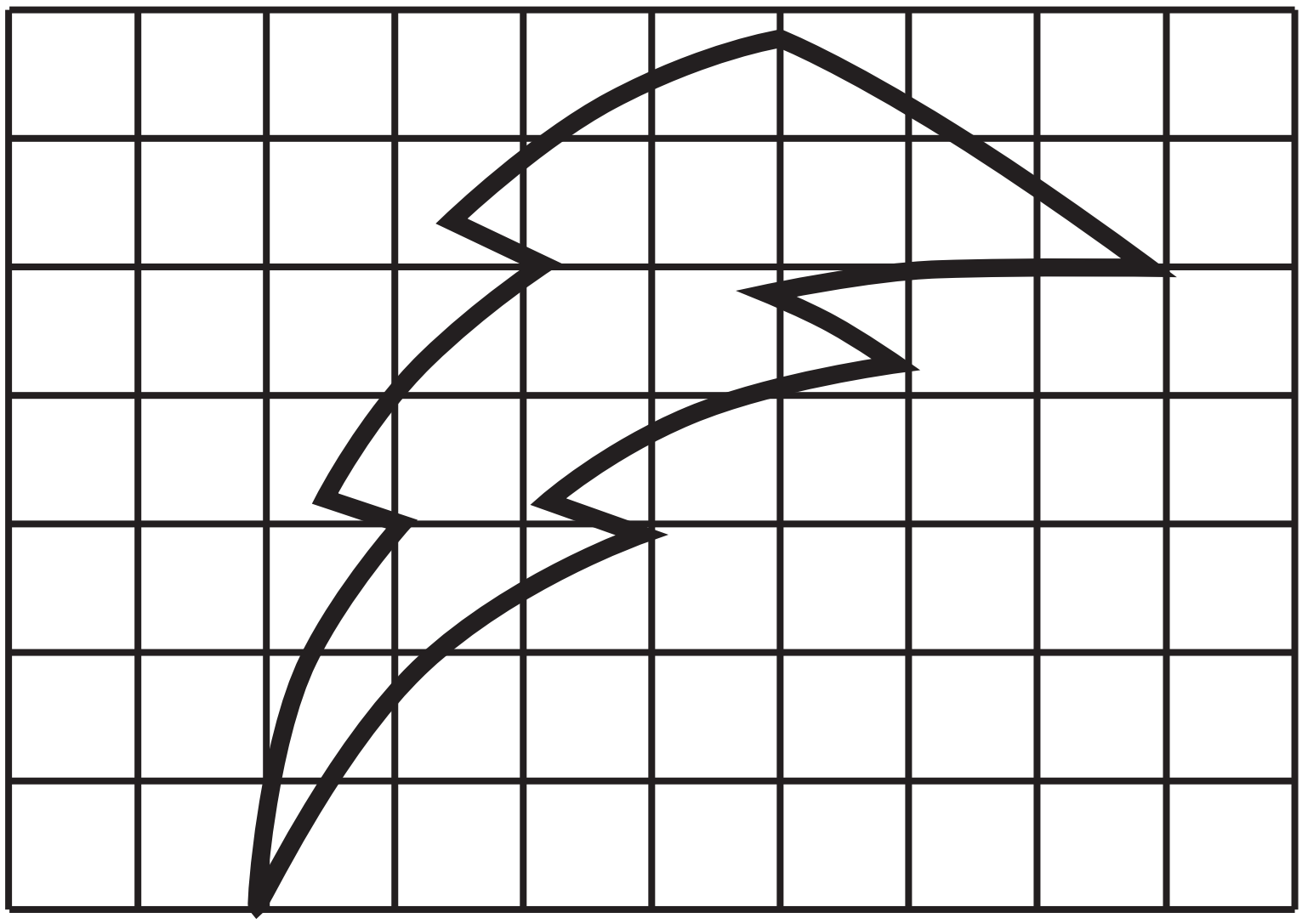
C = Chocolate bar **B = Book**

T = Toy **P = Photo frame**



Question 4

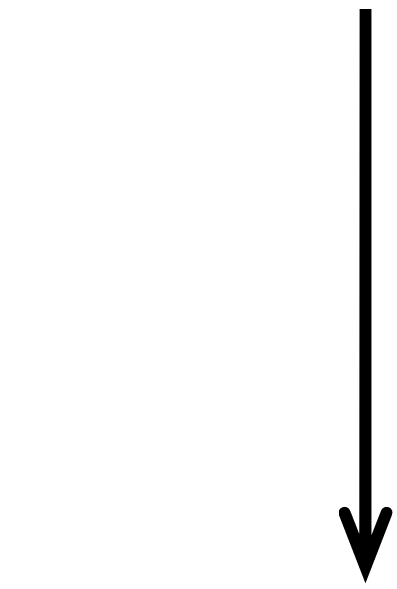
Each square on the grid represents an area of 0•5 m^2



Question 5

Table

LARGEST



SMALLEST

OCEAN
Pacific

Question 6 (a)

Diagrams NOT drawn to scale

Diagram 1

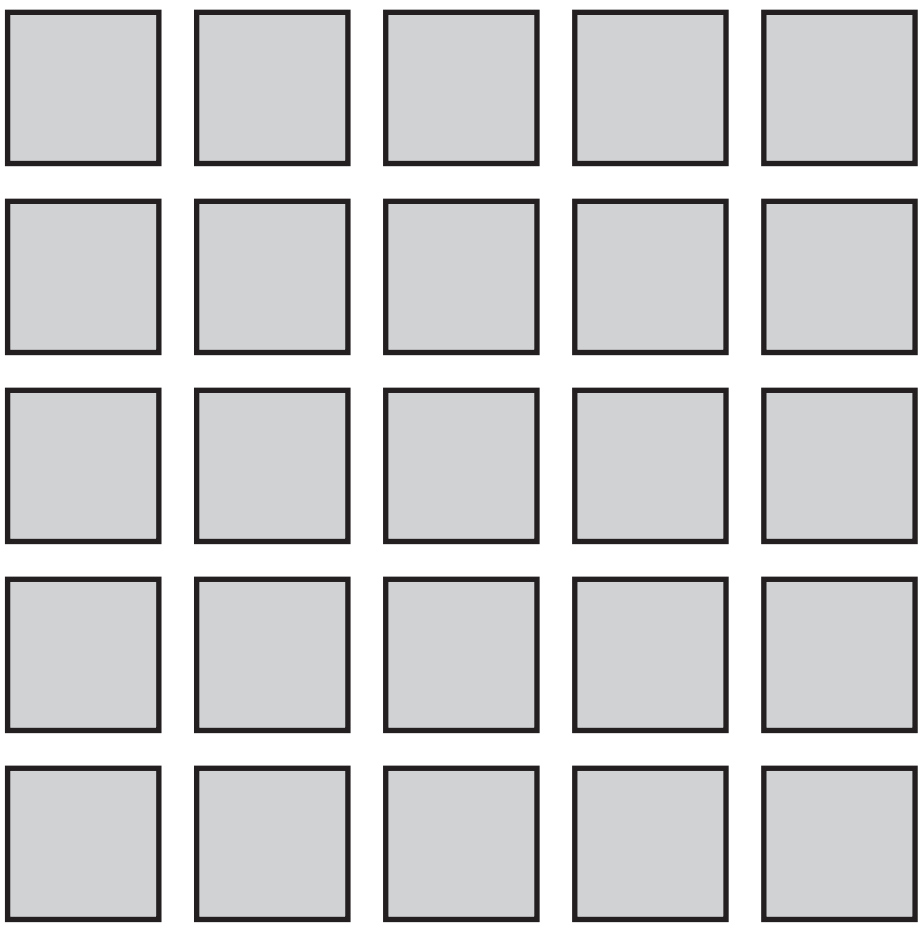
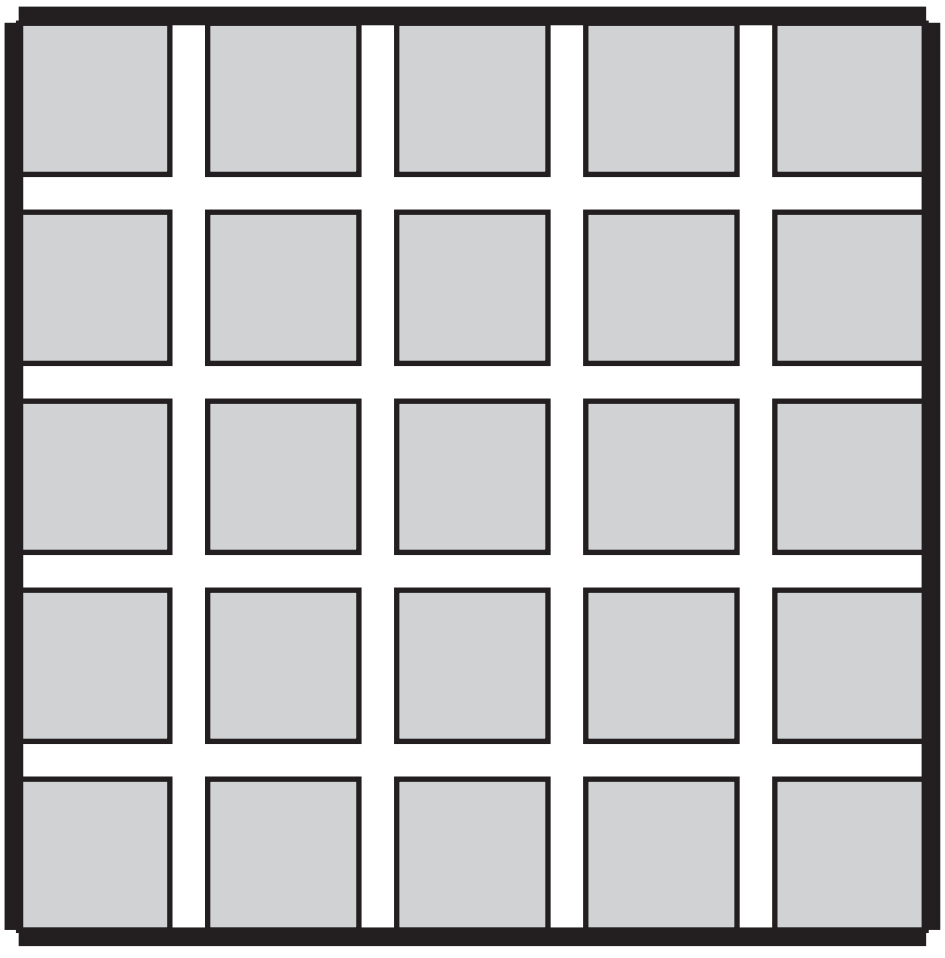
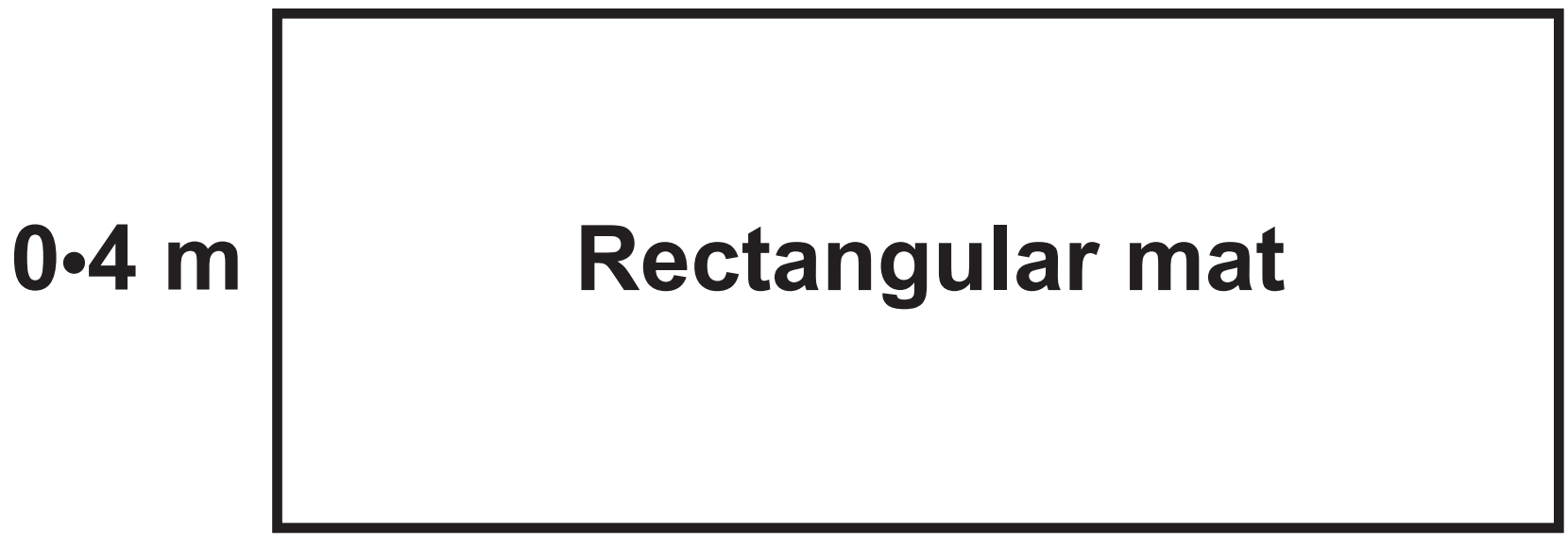


Diagram 2

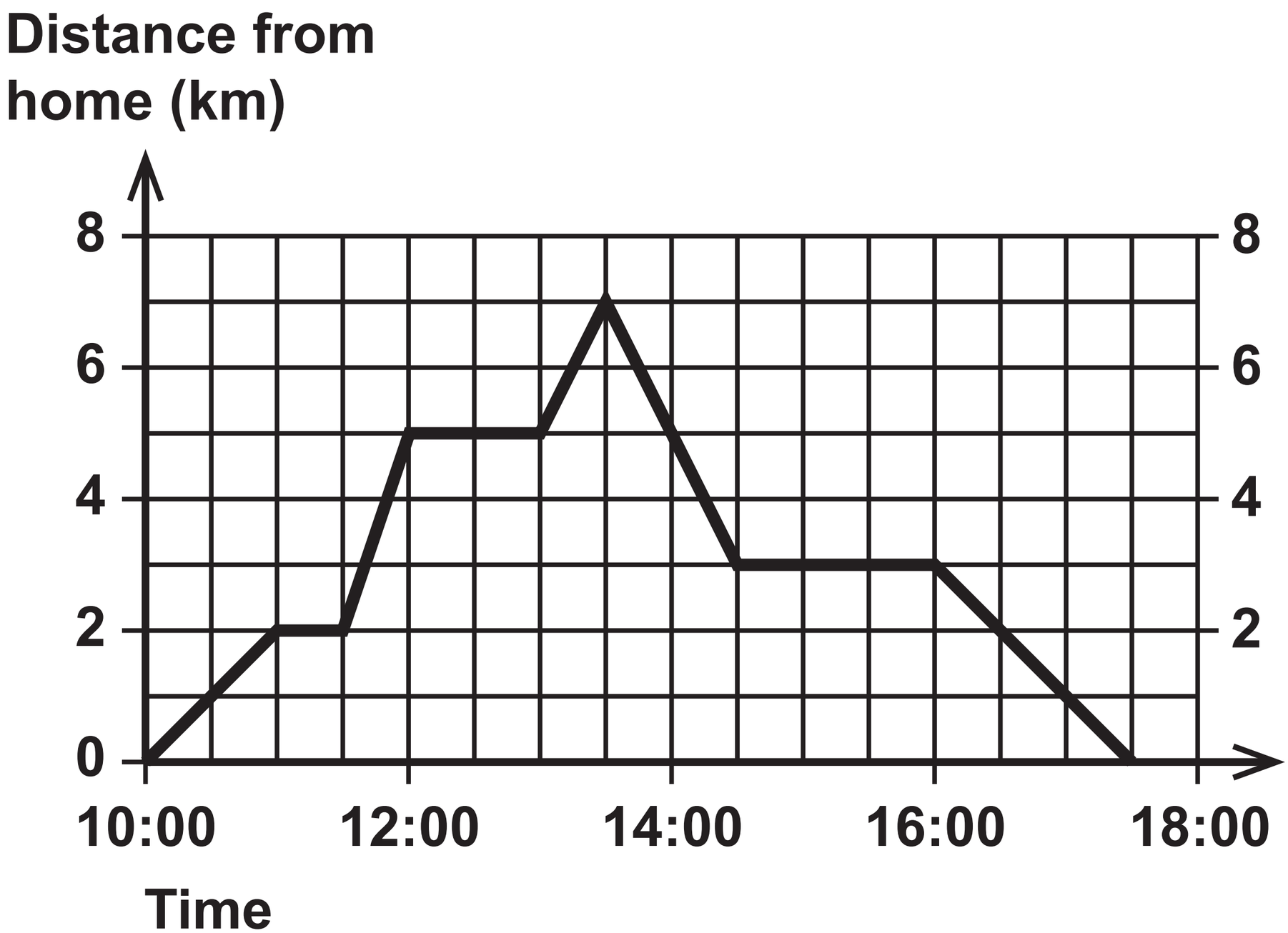


Question 6 (b)

Diagram NOT drawn to scale



Question 7



Question 8 (b)

Information

Values for 100 g of cereal	
Energy	358 calories
Fat	3·7 g
Carbohydrates	69 g
Protein	15 g
Fibre	12 g
Salt	0·3 g

Question 9
Table

Period	Previous meter reading	Present meter reading	Number of units of electricity used
January, February and March 2022	4380	4900	_____

CHARGE FOR ELECTRICITY: _____ units at 21p PER UNIT	£ _____
STANDING CHARGE: 3 months at £7.00 PER MONTH	£ _____
Total charges:	£ _____

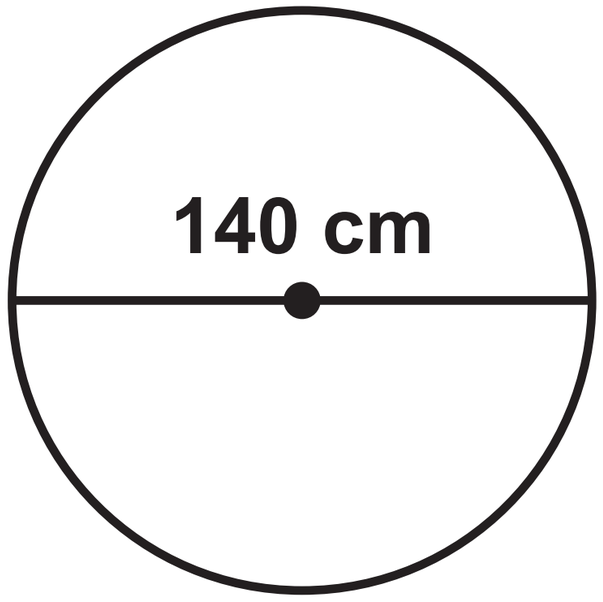
VAT AT 5%:	£ _____

AMOUNT TO PAY £ _____

Question 10 (a)

Diagrams NOT drawn to scale

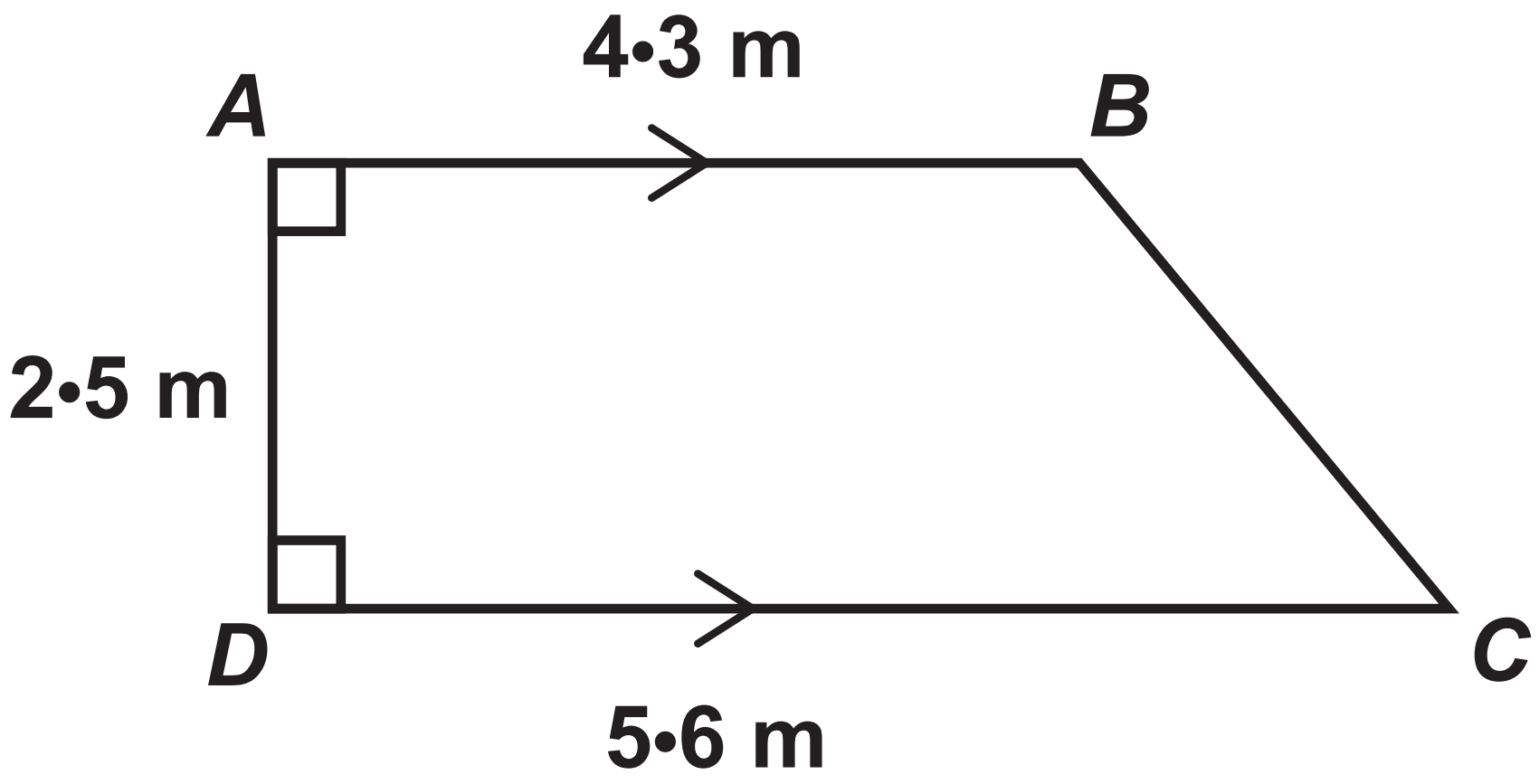
Pond



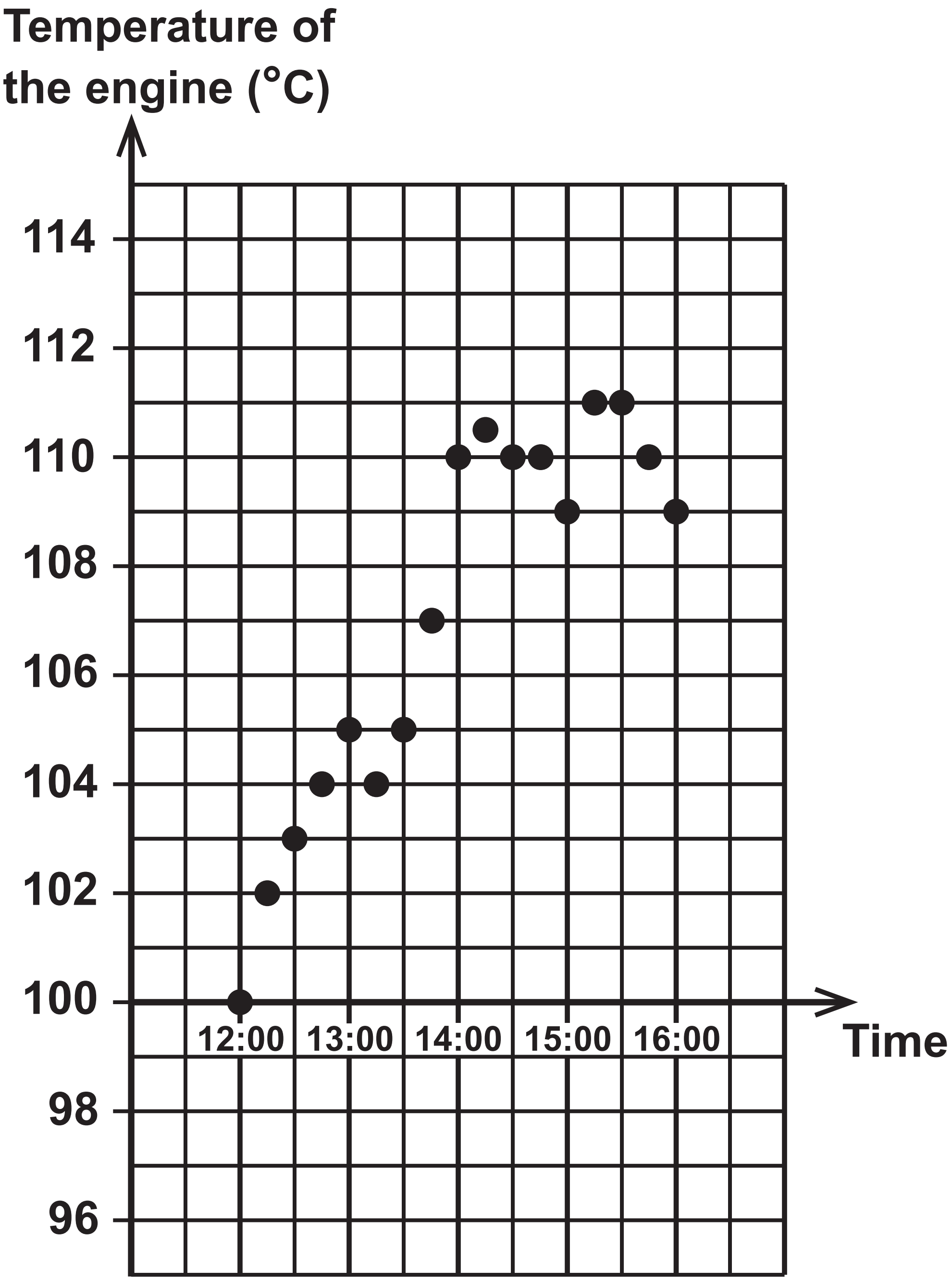
Flowerbed

Question 10 (b)

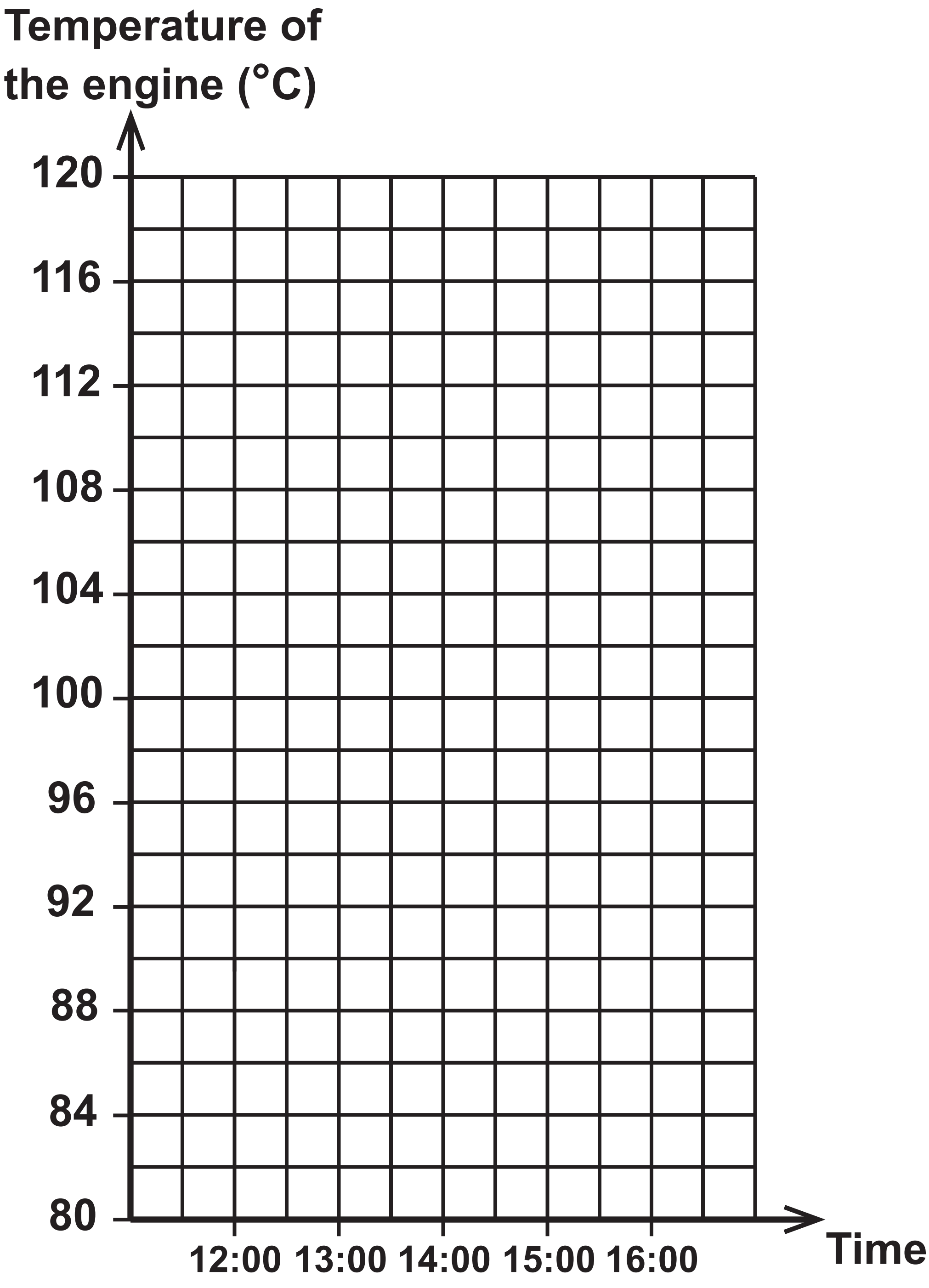
Diagram NOT drawn to scale



Question 11


Temperature of the engine (°C)
114
112
110
108
106
104
102
100
98
96
12:00
13:00
14:00
15:00
16:00
Time

Question 11 (d) (i)



GCSE
MATHEMATICS
and
NUMERACY

FORMULA LIST
FOUNDATION TIER
GCSE

You must not write on these formula pages.

Anything you write on these formula pages will gain NO credit.

Formula List – Foundation Tier

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