Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

3310U20-1

Z22-3310U20-1

TUESDAY, 7 JUNE 2022 – MORNING

MATHEMATICS – NUMERACY
UNIT 2: CALCULATOR-ALLOWED
FOUNDATION TIER

1 hour 25 minutes

ADDITIONAL MATERIALS

A calculator will be required for this paper.

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

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

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

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

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.

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**	

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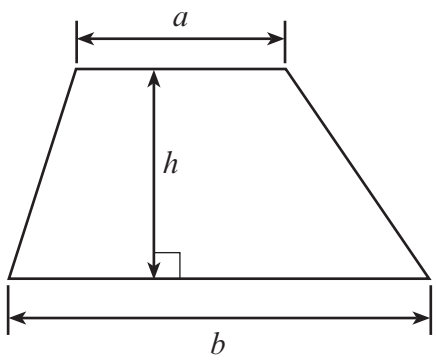
Formula List – Foundation Tier

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



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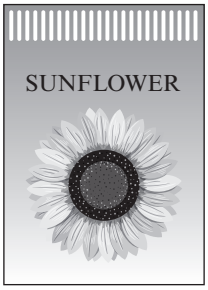
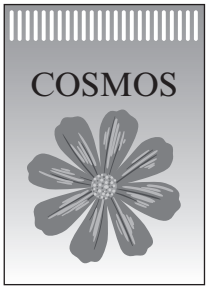
1. Simran buys 5 packets of sunflower seeds and 2 packets of cosmos seeds.
The sunflower seeds cost a total of £9.30.
The total cost of all the packets of seeds that Simran buys is £13.80.





(a) How much does it cost for one packet of sunflower seeds? [2]

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(b) How much does it cost for one packet of cosmos seeds? [2]

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

Different freezers have different 'freezer star ratings'.

The table below 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.

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

(a) What is the difference in temperature between a freezer with a 2-star rating and a freezer with a 4-star rating? [1]

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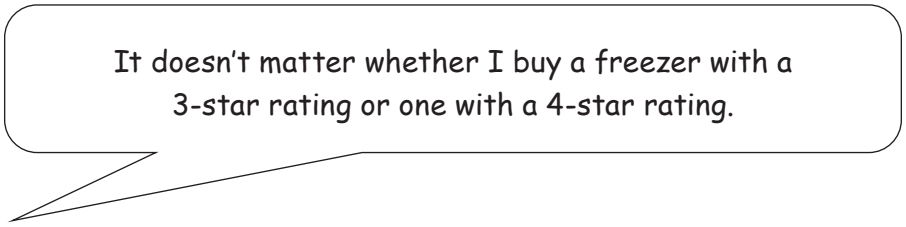
(b) What star rating should a freezer have if it is to be used to store food for 16 weeks? Circle your answer. [1]

1-star 2-star 3-star 4-star

.....

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

She says:



Do you agree?
Give a reason for your answer. [1]

Yes ☐ No ☐

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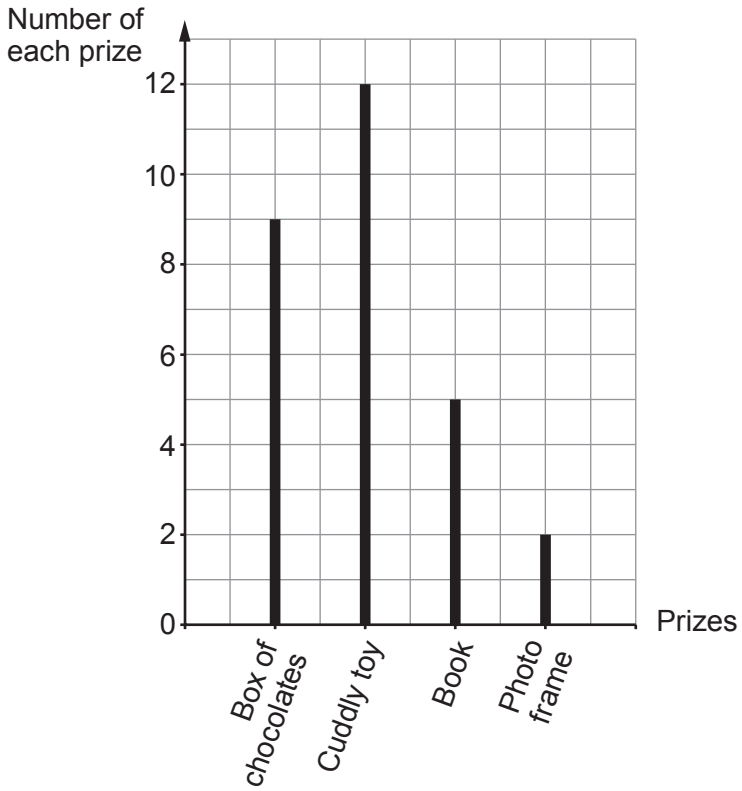
3. Glyn is running a game stall at a village fête.
Each player who wins a game at the stall receives a prize.
These prizes are selected at random from those available.

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



(a) What is the modal prize available? [1]

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

There is an equal chance of winning a box of chocolates, a cuddly toy, a book or a photo frame.

Do you agree? [1]

Yes ☐ No ☐

Give a reason for your answer.

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(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 on the previous page.

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

Box of chocolates	£1.80
Cuddly toy	£2.30
Book	£3.20
Photo frame	£4.70

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

How much did Glyn pay for **all the prizes** at his stall?
You must show all your working. [6 + 2 OCW]

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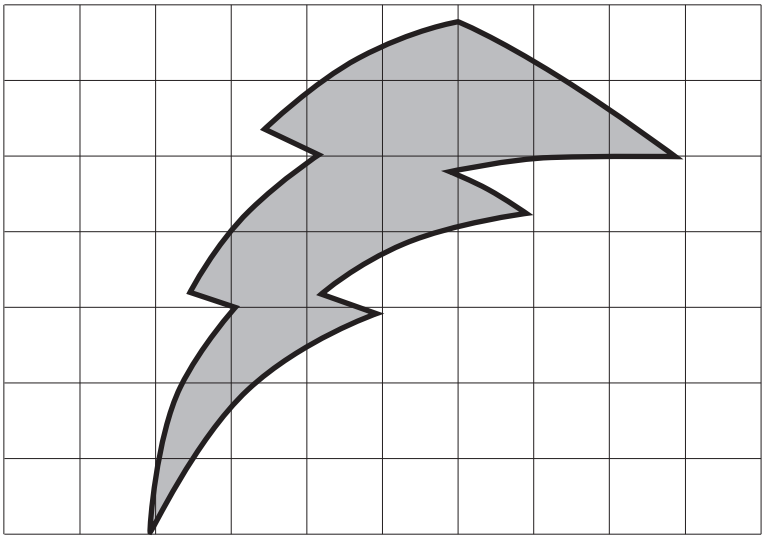
4. A business is having a large glass logo made.
The outline of the logo is drawn to scale on a grid.

Each square on the grid represents an area of $0{\cdot}5\,\text{m}^2$.



Scale: $1\,\text{cm}^2$ represents $0{\cdot}5\,\text{m}^2$

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. [5]

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Total cost of the glass for the logo = ...

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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	$\frac{1}{4}$

Complete the table below 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]

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	Ocean
Largest	Pacific
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	.....
Smallest	.....

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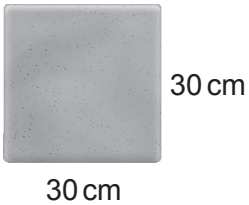
6. Ann is designing her kitchen.

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



Ann's design is shown below.
The tiles are to be laid with a 1 cm gap between them.

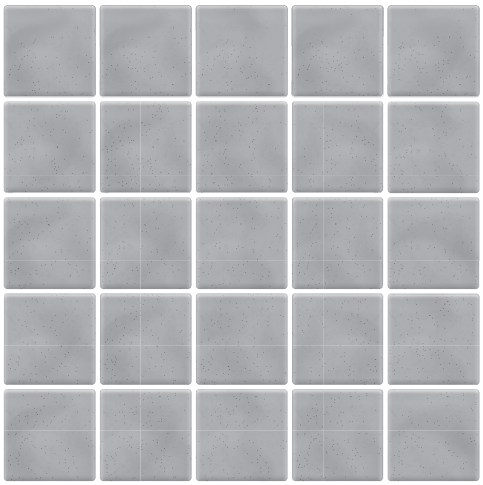


Diagram not drawn to scale

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

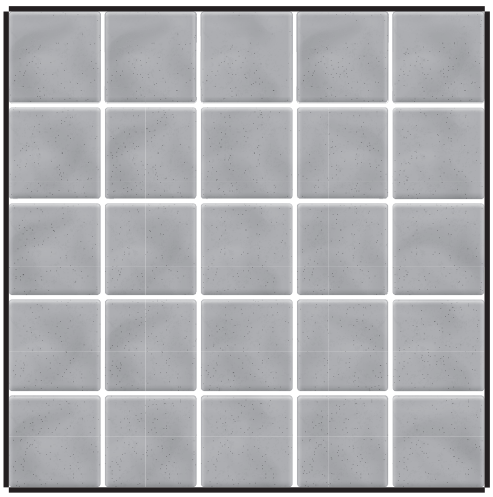


Diagram not drawn to scale

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Calculate the total length of the metallic border.
Give your answer in metres. [4]

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

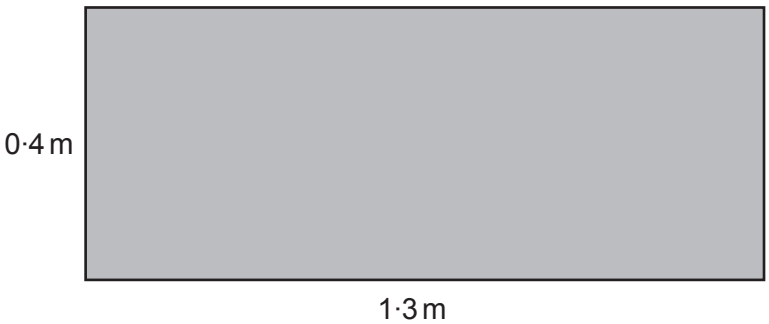

Diagram not drawn to scale

What is the area of the mat?
State the units of your answer. [3]

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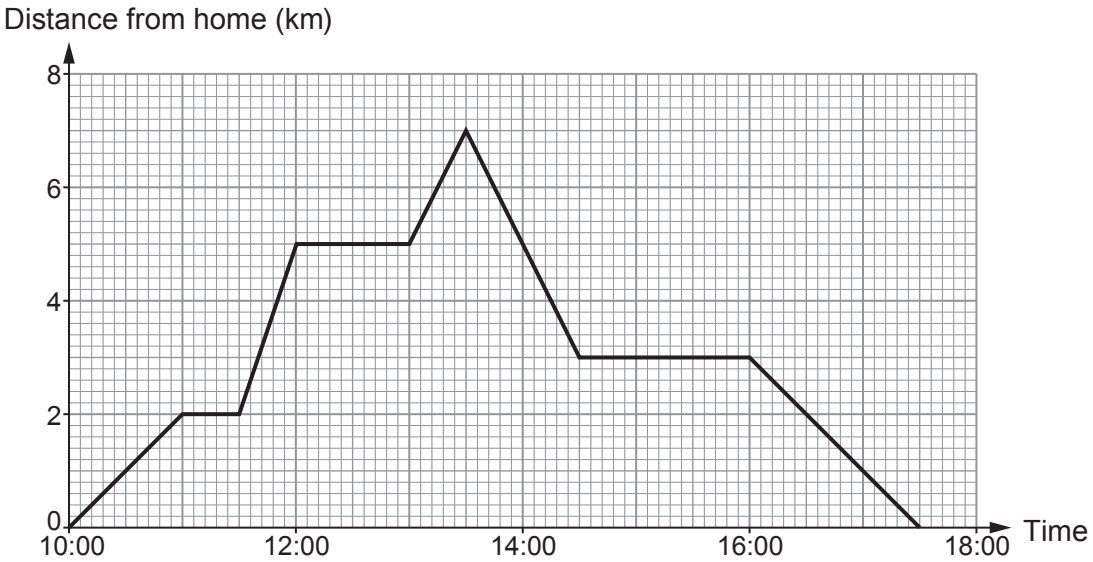
7. The travel graph below shows a journey Luke made on Saturday along a straight road.



(a) How far away from home was Luke at 17:00? [1]

..... km

(b) For what length of time was Luke away from home on this journey?
Circle your answer. [1]

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

(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? [1]

..... km

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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. [3]

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(b) The following information is stated on the packet of breakfast cereal.

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

Express, in its simplest terms, the ratio Carbohydrates : Protein. [1]

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9. After taking her meter reading, Alys always works out her electricity bill.
She has created a table to fill in, as shown below.

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 £ .....

Complete Alys's table to calculate her electricity bill. [7]

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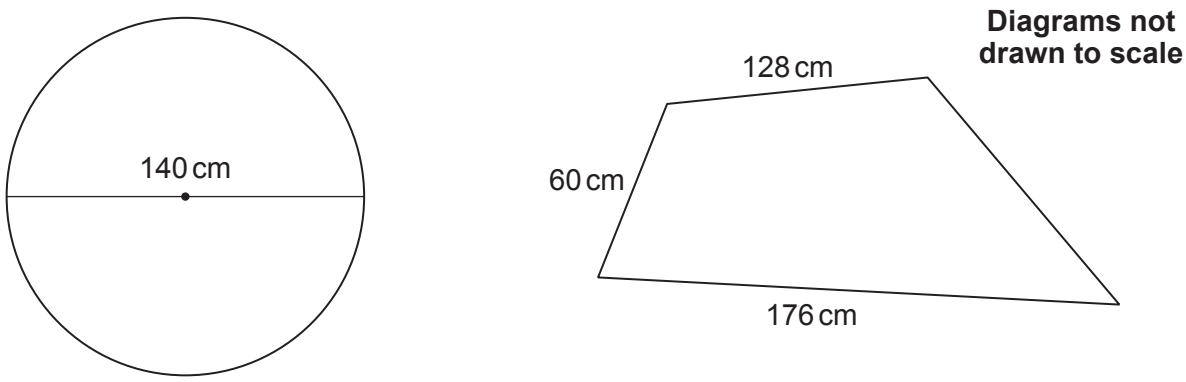
10. (a) Esme has a pond and a flowerbed in her garden.
The pond is circular and the flowerbed is in the shape of a quadrilateral, as shown below.



The diameter of the pond is 140 cm.
The perimeter of the pond and the perimeter of the flowerbed are equal.

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. [4]

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(b) Bill has a vegetable plot in his garden.
It is in the shape of a trapezium, as shown below.

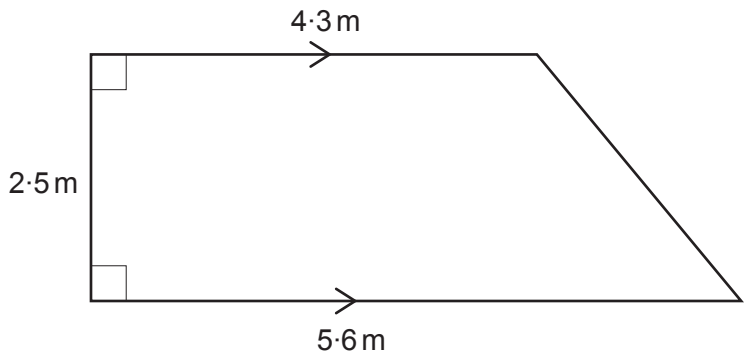

Diagram not drawn to scale

Fertiliser is sold in small bags.
Each bag contains enough fertiliser to treat an area of $0{\cdot}9\,m^2$.
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. [5]

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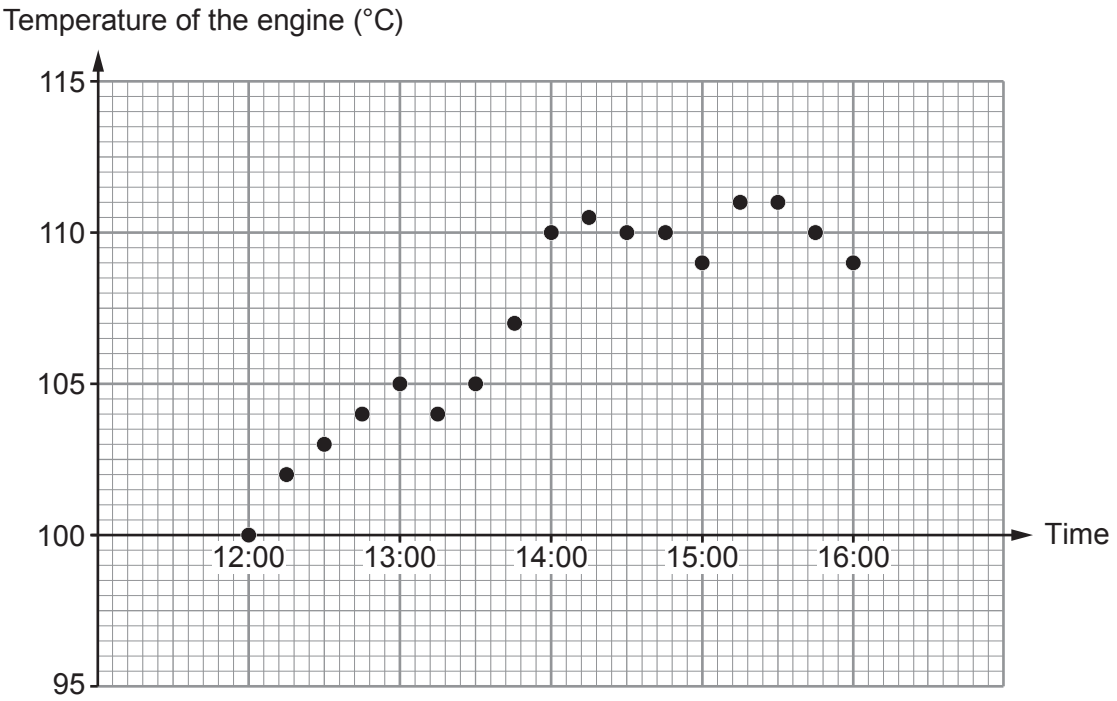
11. An engine normally runs at 100°C.
When the engine runs at 110°C or more, a warning light comes on.

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



(a) How often was the temperature of the engine recorded?
Circle your answer. [1]

Every 5 minutes Every 12 minutes Every 15 minutes

Every $2\frac{1}{2}$ minutes Every 30 minutes

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(b) At what time was it first recorded that the warning light had come on? [1]

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(c) What was the range of the recorded temperatures of the engine between 12:00 and 16:00? [1]

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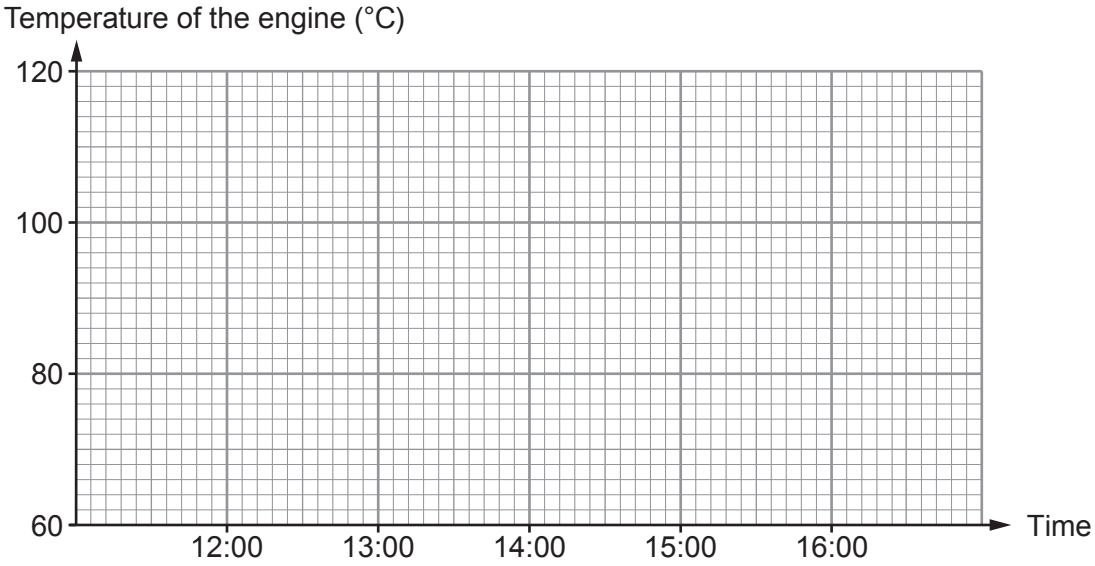
(d) (i) Use the graph paper below to plot the recorded temperature of the engine at 12:00, 13:00, 14:00, 15:00 and 16:00 only. [1]



(ii) Why is the graph you have drawn misleading? [1]

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END OF PAPER

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

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