GCSE 3310U40-1

MATHEMATICS – NUMERACY
UNIT 2: CALCULATOR – ALLOWED
INTERMEDIATE TIER

THURSDAY, 9 MAY 2019 – MORNING

1 hour 45 minutes (plus your additional time allowance)

A CALCULATOR WILL BE REQUIRED FOR THIS PAPER

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	11	
2.	8	
3.	4	
4.	5	
5.	6	
6.	10	
7.	8	
8.	11	
9.	9	
10.	8	
Total	80	

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

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.

A spare Diagram Booklet.

Models for Question 7 (a) (i) and Question 7 (b).

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 continuation pages at the back of the booklet. Question numbers must be given for all work written on the continuation page(s).

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 2 (a), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

1. Ian owns two shops. One is in Ffordd Owain and the other is in Arthur Avenue.

   For each shop, Ian has been presented with the sunglasses sales for last week.

   Look at the diagrams for Question 1 in the separate Diagram Booklet.

   Diagram 1 is a pie chart showing the daily sunglasses sales in the Ffordd Owain shop.

   Diagram 2 is a pictogram showing the daily sunglasses sales in the Arthur Avenue shop.

continued on the next page . . .

Question 1 continued

1. (a) For each shop, what fraction of the sunglasses sold last week was sold on Friday? Express your answers as fractions in their simplest terms.

(i) Ffordd Owain:

Fraction, in its simplest terms

[2 marks]

Question 1 (a) continued

1. (a) (ii) **Arthur Avenue:**

Fraction, in its simplest terms

_____ [2 marks]

continued on the next page . . .

Question 1 continued

1. (b) At the Arthur Avenue shop, what percentage of the sunglasses sold last week was sold on Tuesday?

9

[2 marks]

continued on the next page . . .

Question 1 continued

1. (c) On Saturday, how many more sunglasses were sold in the Ffordd Owain shop than in the Arthur Avenue shop?

11

[5 marks]

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

Edmund needs carrots to make soup.
His two local supermarkets are SuperM and FairMart.

450 g of carrots cost 27p in SuperM.

The same variety of carrots cost 57p per kg in FairMart.

continued on the next page . . .

Question 2 (a) continued

Edmund wants to buy carrots that are the best value for money.

Should he buy carrots from SuperM or from FairMart?

Give a reason for your answer.

You must show all your working.

(Turn over)

[3 marks + 2 marks OCW]

continued on the next page . . .

Question 2 continued

2. (b) Edmund plans to use the recipe shown below to make soup.

CARROT SOUP,
SERVES 4 PEOPLE

450 grams carrots

0•8 litres stock

4 tablespoons of cream

2 onions

continued on the next page . . .

Question 2 continued

He starts to write the recipe for serving 25 people.

CARROT SOUP TO SERVE 25 PEOPLE

_____ grams carrots

_____ litres stock

_____ tablespoons of cream

_____ WHOLE onions

Edmund does not want part of an onion left over. Complete the recipe for Edmund.

(Turn over)

[3 marks]

3. Rhys lives in St Asaph.

He wants to video call friends in Montreal, New Delhi and Sydney.

(a) Look at the table for Question 3 (a) in the separate Diagram Booklet.

The table shows times around the world when it is 12:30 in St Asaph.

continued on the next page . . .

Question 3 (a) continued

3. (a) (i) When it is 23:30 on Saturday in St Asaph, what time and day is it in Montreal?

Circle your answer.

04:30 Sunday	**07:30 Saturday**	**18:30 Saturday**
02:30 Saturday	**12:30 Saturday**	

[1 mark]

Question 3 (a) continued

3. (a) (ii) When it is 01:00 on Sunday in Sydney, what time and day is it in St Asaph?

Circle your answer.

16:00 Sunday	16:00 Saturday	10:00 Sunday
10:00 Saturday	06:00 Monday	

[1 mark]

Question 3 continued

3. (b) 1 Australian dollar (AUD) is worth £0.61

How much is £320 worth in Australian dollars?

Give your answer to the nearest Australian dollar.

£320 = _____ AUD

[2 marks]

4.

ICE SKATE HIRE CHARGES

Hire any pair of ice skates for £3.25
PLUS
£2.40 for every hour or part of an hour hired*

***any minute or more into the next hour is charged as 1 hour**

(a) Bryn returns his hired ice skates after 3 hours 38 minutes.

How much will the total charge be for hiring these ice skates?

_____

_____

_____

[2 marks]

continued on the next page . . .

Question 4 continued

4. (b) Beth pays £8.05 to hire ice skates.

What is the minimum whole number of minutes that she could have hired the ice skates for before returning them?

_____ minutes

[3 marks]

5. (a) A survey was carried out to find out how often people used the swimming pool in a sports centre.

The following two questions were asked in a questionnaire.

Q1. How far away from the sports centre do you live?
Q2. How often do you go swimming?

(i) Give ONE reason why question 1 is a useful question to ask.

[1 mark]

5. (a) (ii) Explain why the answers to question 2 might be difficult to analyse.

[1 mark]

continued on the next page . . .

Question 5 (a) continued

5. (a) (iii) A person answers that they go swimming.

Write a question that could be used to find out how long this person spends in the pool, on average, each time they go swimming.

You must give groups for collecting the data.

Question: _____

[2 marks]

(Turn over)

Question 5 continued

5. (b) Look at the diagram for Question 5 (b) in the separate Diagram Booklet.

The diagram is a graph.

Jamil works at the HAFAN PARC swimming pool.

He records the temperature of the water in the pool from 8 a.m. to 11:30 a.m.

Jamil draws the graph shown.

continued on the next page . . .

Question 5 (b) continued

Use the graph to answer the following questions about the temperature of the water between 8 a.m. and 11:30 a.m.

5. (b) (i) What is the range of the temperature of the water?

_____

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 5 continued

5. (b) (ii) For swimming, the most suitable temperature of the water in the pool is between 27°C and 28°C inclusive.

Find the length of time that the water in the pool was most suitable for swimming. Give your answer in minutes.

The water was most suitable for

_____ minutes

[1 mark]

6. (a) Look at the diagram for Question 6 (a) in the separate Diagram Booklet.

The diagram is a Venn diagram.

Rhian carried out a survey before an international rugby match between Wales and Ireland.
She asked a number of Wales supporters how they travelled to the match.

Rhian displayed her results in a Venn diagram, as shown.

continued on the next page . . .

Question 6 (a) continued

6. (a) (i) How many of these supporters' journeys included travel by both train and taxi?

Circle your answer.

1	3	7	8	10

[1 mark]

continued on the next page . . .

Question 6 (a) continued

6. (a) (ii) How many of these supporters' journeys included travel by car? Circle your answer.

19	78	102	180	195

[1 mark]

continued on the next page . . .

Question 6 (a) continued

6. (a) (iii) Calculate the percentage of the number of supporters in the survey whose journeys did NOT include any travel by car, bus, train, or taxi.

Give your answer correct to 1 decimal place.

[4 marks]

continued on the next page . . .

Question 6 continued

6. (b) There were 71 532 supporters in the stadium watching the match. A newspaper headline writes this number of supporters correct to 2 significant figures. Which of the following numbers should appear in this headline? Circle your answer.

72	71 000	71 400	71 500	72 000

[1 mark]

continued on the next page . . .

Question 6 continued

6. (c) Look at the diagram for Question 6 (c) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The rugby pitch at the stadium is measured. On the diagram, each measurement is given CORRECT TO THE NEAREST 10 CENTIMETRES.

The diagram has been labelled *ABCD*.

In the diagram, *AD* = 70 m.

continued on the next page . . .

Question 6 (c) continued

What is the least possible length of *AB*?

Give your answer in metres.

You must show all your working.

[3 marks]

7. (a) Ask for the model for Question 7 (a). The model is NOT made to scale.

The model represents a tin of baked beans.

(i) The internal measurements of the tin of baked beans are:

- radius 3·6 cm,
- height 9·3 cm.

Calculate the internal volume of the tin.

[2 marks]

continued on the next page . . .

Question 7 (a) continued

7. (a) (ii) Every 1 cm^3 of baked beans in a tin has a mass of 1 gram.

A portion of baked beans is $\frac{1}{2}$ a tin.

What is the mass of a portion of baked beans?

A portion of baked beans has a mass of

_____ grams [1 mark]

Question 7 continued

7. (b) Ask for the two models for Question 7 (b). The models are NOT made to scale.

Both models represent tins of baked beans.

Model 1 has internal measurements of radius 3·6 cm and height 9·3 cm.

Model 2 has a radius of 4·2 cm and is mathematically similar to Model 1.

Calculate the height of the larger tin of beans.

[2 marks]

continued on the next page . . .

Question 7 continued

7. (c) In a portion of baked beans there is:

- **1·85 g of salt,**
- **11·7 g of sugar.**

For women, the recommended daily allowance of:

- **salt is 6 g**
- **sugar is 90 g**

Consider a portion of baked beans. Is it salt or sugar that provides the greater proportion of the recommended daily allowance for women?
You must show all your working.

(Turn over)

(Turn over)

[3 marks]

8. (a) On 1st June, Delyth budgets for her next electricity bill.

This bill will be for the months of June, July and August.

Her bill will have to be paid at the beginning of September.

She knows:

- the standing charge is £8 PER MONTH,
- her meter reading on 1st June is 20 150 kWh,
- her estimate for her meter reading on 31st August is 20 950 kWh,

continued on the next page . . .

Question 8 (a) continued

- her agreement states that electricity costs 23p per kWh,
- VAT at 5% is payable on the total of the standing charge and the cost of the electricity used.

Calculate how much she should budget each month so that she is able to pay her next electricity bill.

(Turn over)

(Turn over)

[7 marks]

continued on the next page . . .

Question 8 continued

8. (b) Delyth invested £500 in a saver bank account 20 years ago. She did not withdraw money or make any other payments into this account.

The bank paid 2•2% compound interest per annum during the first 5 years.

Compound interest at 1•6% per annum was paid for the remaining 15 years.

continued on the next page . . .

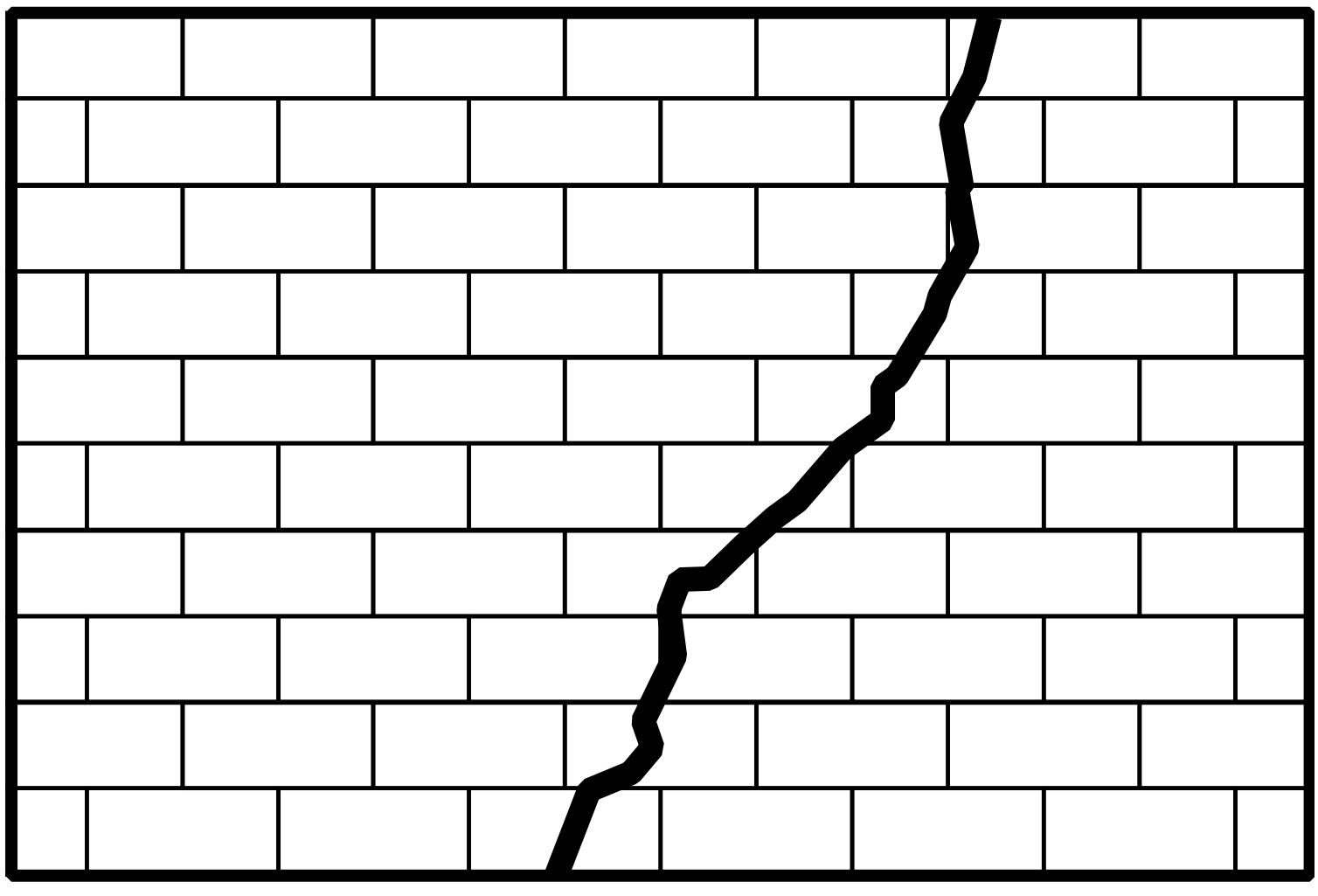
Question 8 (b) continued

Delyth closes the account after 20 years.

How much money should she receive?

[4 marks]

9. Mr Jakob notices a crack in a vertical wall which stands on horizontal ground.



continued on the next page . . .

Question 9 continued

9. (a) Look at the diagram for Question 9 (a) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

Mr Jakob fixes two temporary supports against the wall, as shown in the diagram.

continued on the next page . . .

Question 9 (a) continued

9. (a) (i) Look at the diagram for Question 9 (a) (i) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows part of Diagram 9 (a).

Calculate the length of Support 1

[3 marks]

continued on the next page . . .

Question 9 (a) continued

9. (a) (ii) Look at the diagram for Question 9 (a) (ii) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows part of Diagram 9 (a).

The length of Support 2 is 2•6 m.

Calculate the angle between the horizontal ground and Support 2

(Turn over)

[3 marks]

continued on the next page . . .

Question 9 continued

9. (b) Mr Jakob gets a quote of £516 for rebuilding his wall.

The quote includes:

- **8 hours' labour costs at £22.50 per hour,**
- **a 20% discount off the cost of the bricks.**

Calculate the cost of the bricks before the discount.

[3 marks]

(Turn over)

10. (a) KENWORTH ELECTRICAL specialises in wiring new houses.

The monthly wages of all KENWORTH ELECTRICAL employees are summarised in the frequency table below.

Monthly wage, £X	Frequency
$1800 \leq X < 2000$	64
$2000 \leq X < 2100$	50
$2100 \leq X < 2400$	2
$2400 \leq X < 5800$	0
$5800 \leq X < 7800$	4

continued on the next page . . .

Question 10 (a) continued

10. (a) (i) How many people does KENWORTH ELECTRICAL employ?

Circle your answer.

5	**6**	**50**	**100**	**120**

[1 mark]

continued on the next page . . .

Question 10 (a) continued

10. (a) (ii) In which group does the median monthly wage lie? Circle your answer.

$1800 \leq X < 2000$
$2000 \leq X < 2100$
$2100 \leq X < 2400$
$2400 \leq X < 5800$
$5800 \leq X < 7800$

[1 mark]

Question 10 (a) continued

10. (a) (iii) Alysia is an accountant working for KENWORTH ELECTRICAL.

She knows the exact wage of each employee.

Alysia says,

> **"It would be misleading to use the mean monthly wage as an average."**

Explain why Alysia has reached this conclusion.

_____

_____

[1 mark]

continued on the next page . . .

Question 10 continued

10. (b) MAESTEG ELECTRICAL also specialises in wiring new houses.

The monthly wages of all MAESTEG ELECTRICAL employees are summarised in the frequency table below.

Monthly wage, £X	Frequency
$1800 \leq X < 2000$	8
$2000 \leq X < 2200$	40
$2200 \leq X < 2400$	22
$2400 \leq X < 3000$	10

continued on the next page . . .

Question 10 (b) continued

10. (b) (i) Look at the diagram for Question 10 (b) (i) in the separate Diagram Booklet. It is an incomplete cumulative frequency diagram.

Use the frequency table to complete the cumulative frequency diagram to display the monthly wages of all MAESTEG ELECTRICAL employees.

[2 marks]

continued on the next page . . .

Question 10 (b) continued

Use the cumulative frequency diagram to answer each of the following questions.

10. (b) (ii) Which of the following is the best estimate for the median monthly wage of MAESTEG ELECTRICAL employees? Circle your answer.

£2100	£2160	£2200	£2360	£3000

[1 mark]

10. (b) (iii) Calculate an estimate of the percentage of MAESTEG ELECTRICAL employees who have a monthly wage of less than £2050
You must show all your working.

[2 marks]

END OF PAPER

TOTAL 80 MARKS

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

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GCSE

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MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

THURSDAY, 9 MAY 2019 – MORNING

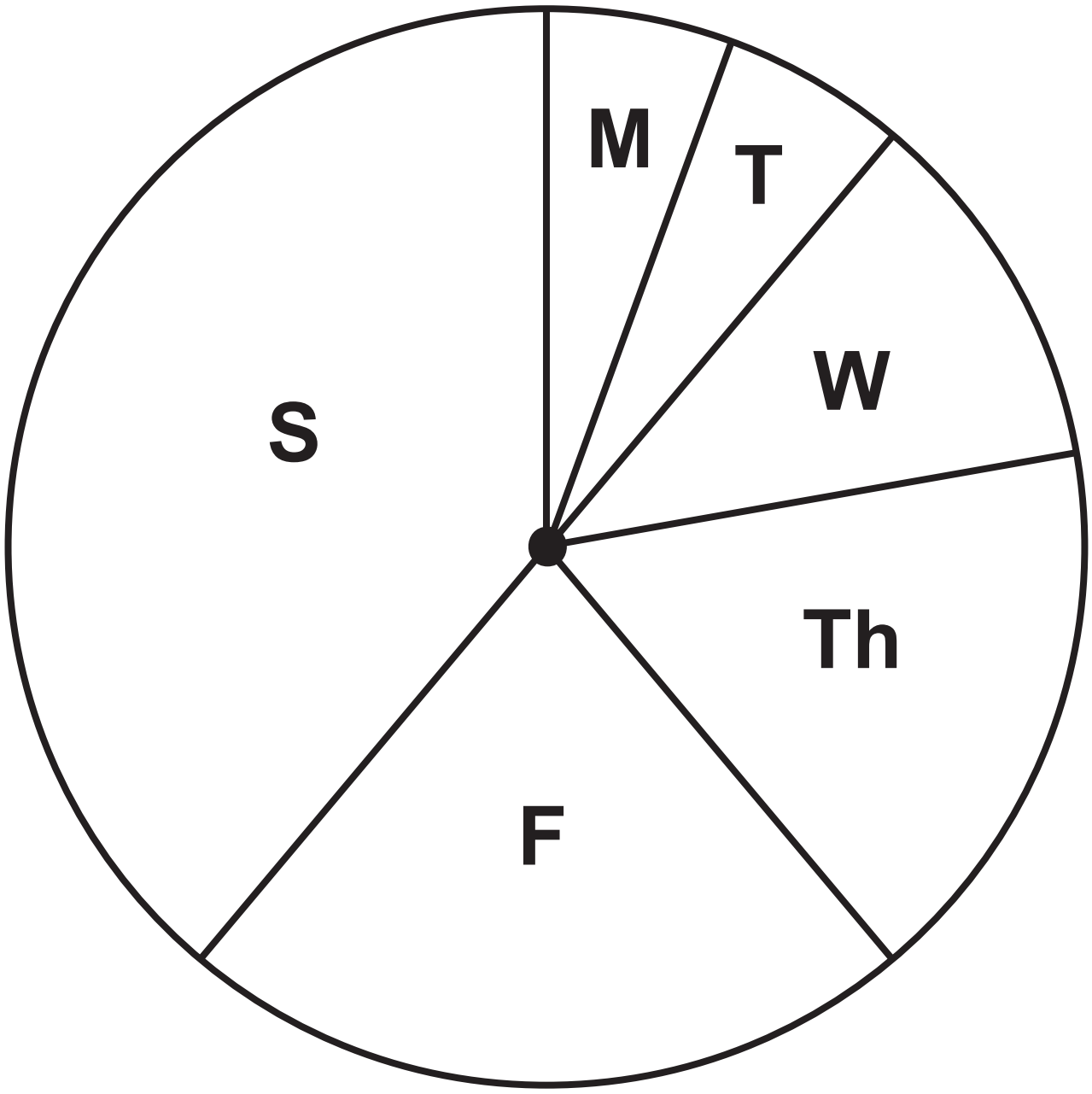
Diagram Booklet

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	**0**

Question 1

Diagram 1
FFORDD OWAIN DAILY SUNGLASSES SALES FOR LAST WEEK

In total, 90 pairs of sunglasses were sold.

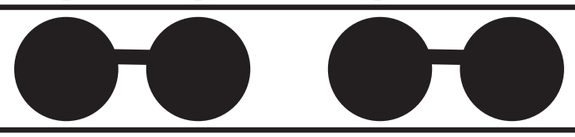
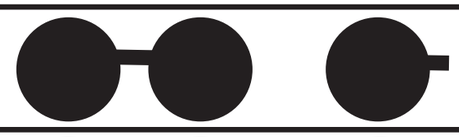
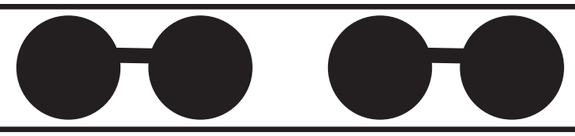
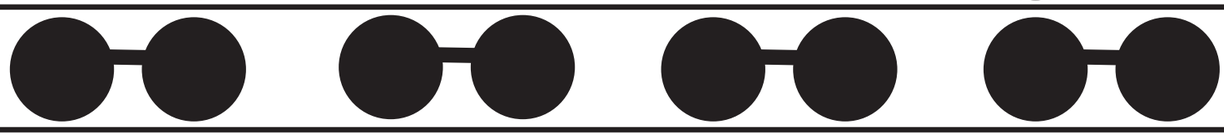


Key: M - Monday
T - Tuesday
W - Wednesday
Th - Thursday
F - Friday
S - Saturday

Question 1

Diagram 2
ARTHUR AVENUE DAILY SUNGLASSES SALES FOR LAST WEEK

Key:  **represents 4 pairs of sunglasses**

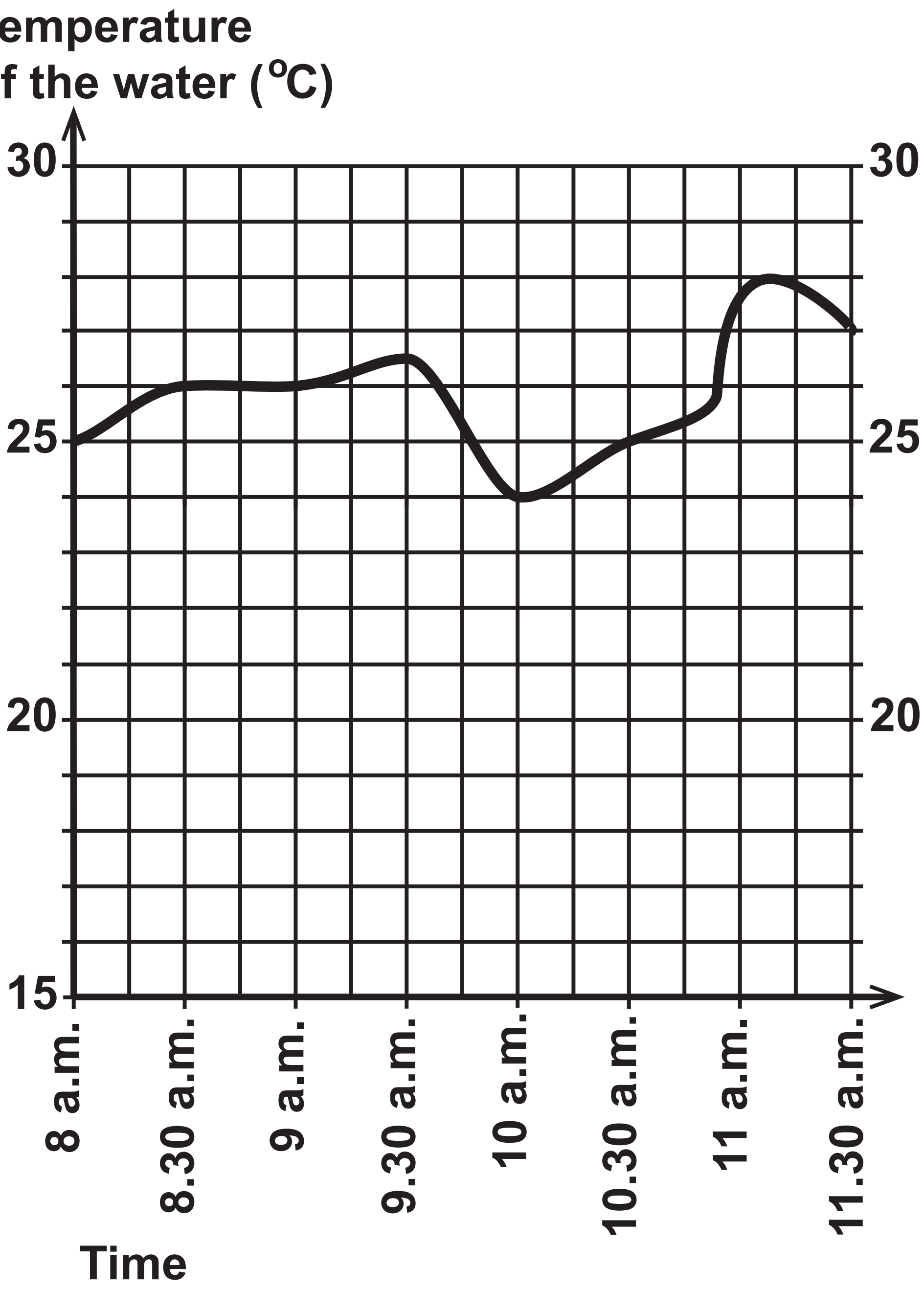
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

Question 3 (a)

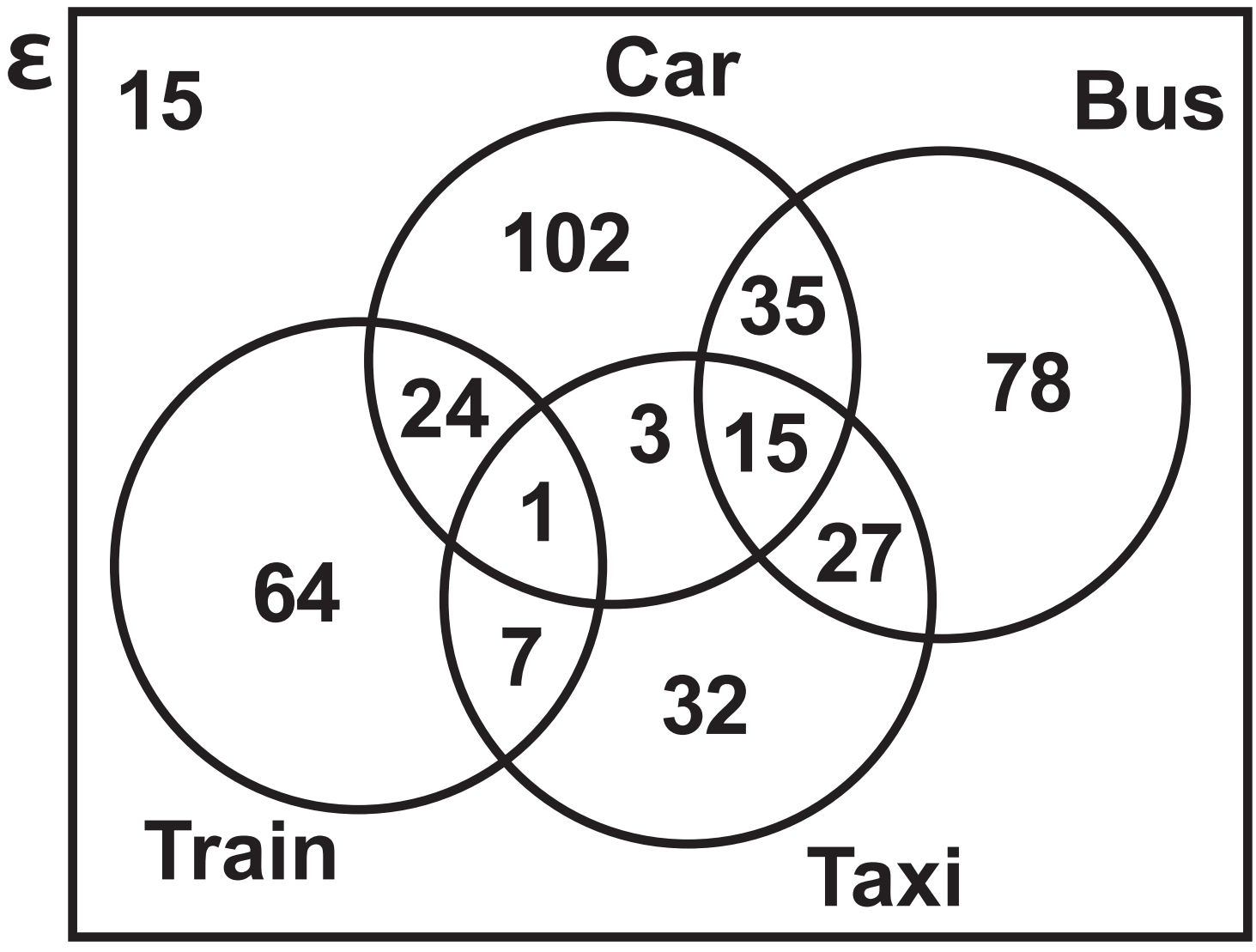
Table

CITY	TIME	DAY
St Asaph	12:30	Saturday
Montreal	07:30	Saturday
New Delhi	17:00	Saturday
Sydney	21:30	Saturday

Question 5 (b)

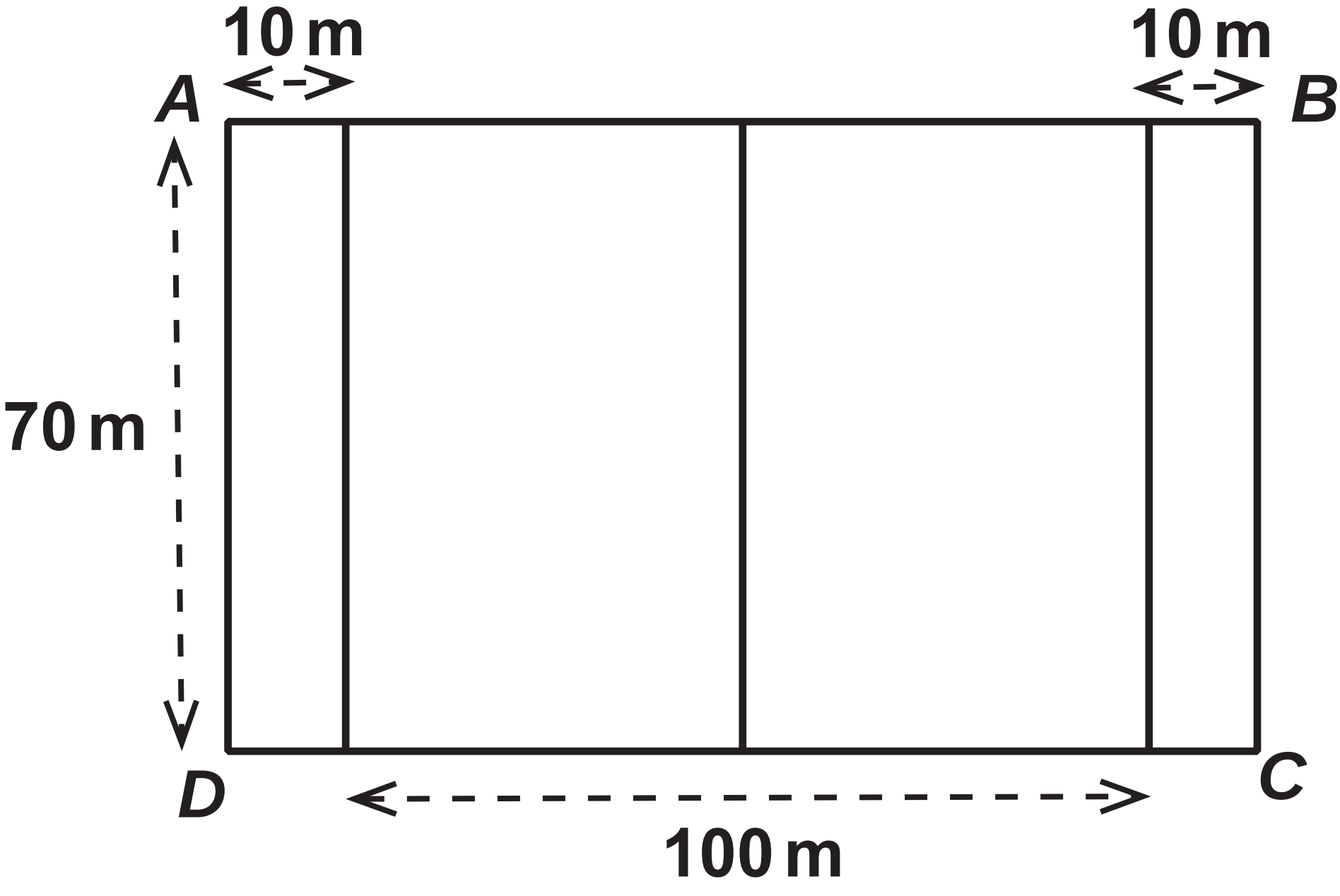

Temperature of the water (°C)
30
25
20
15
30
25
20
8 a.m.
8.30 a.m.
9 a.m.
9.30 a.m.
10 a.m.
10.30 a.m.
11 a.m.
11.30 a.m.
Time

Question 6 (a)



Question 6 (c)

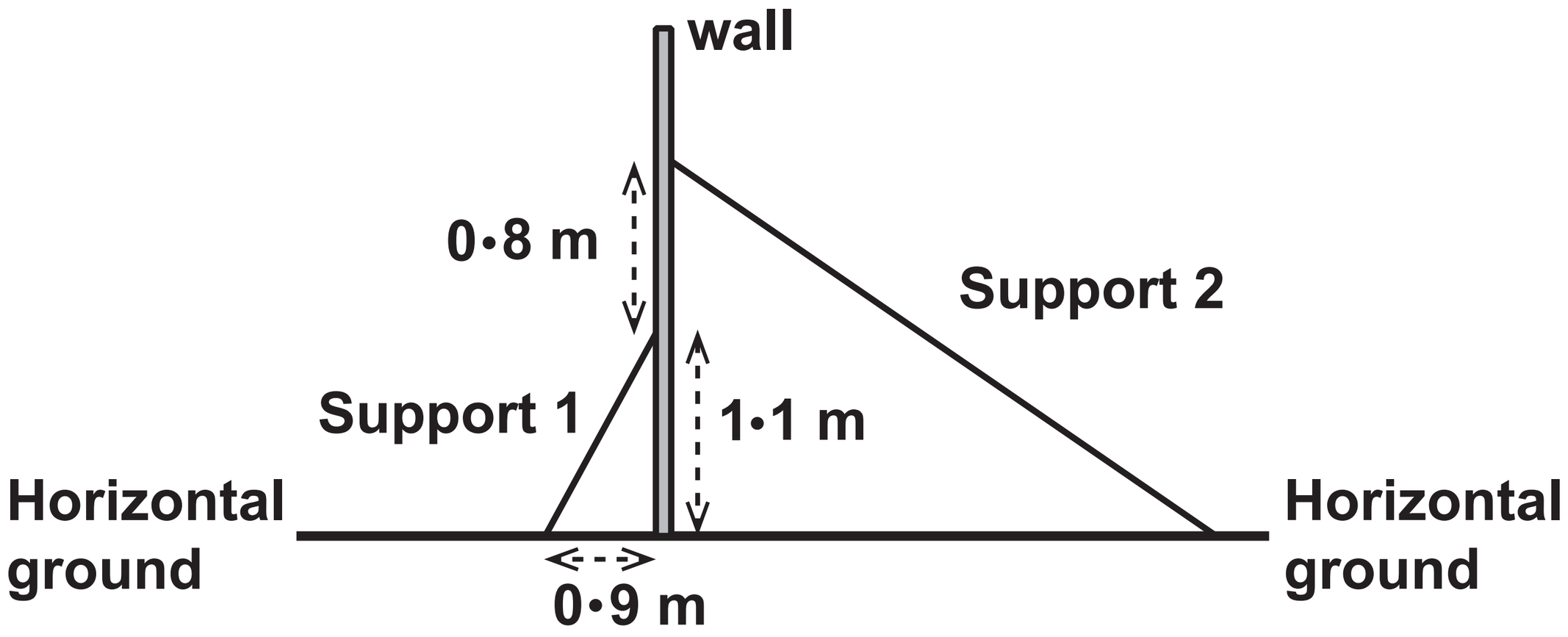
Diagram NOT drawn to scale



Question 9 (a)

Diagram 9 (a)

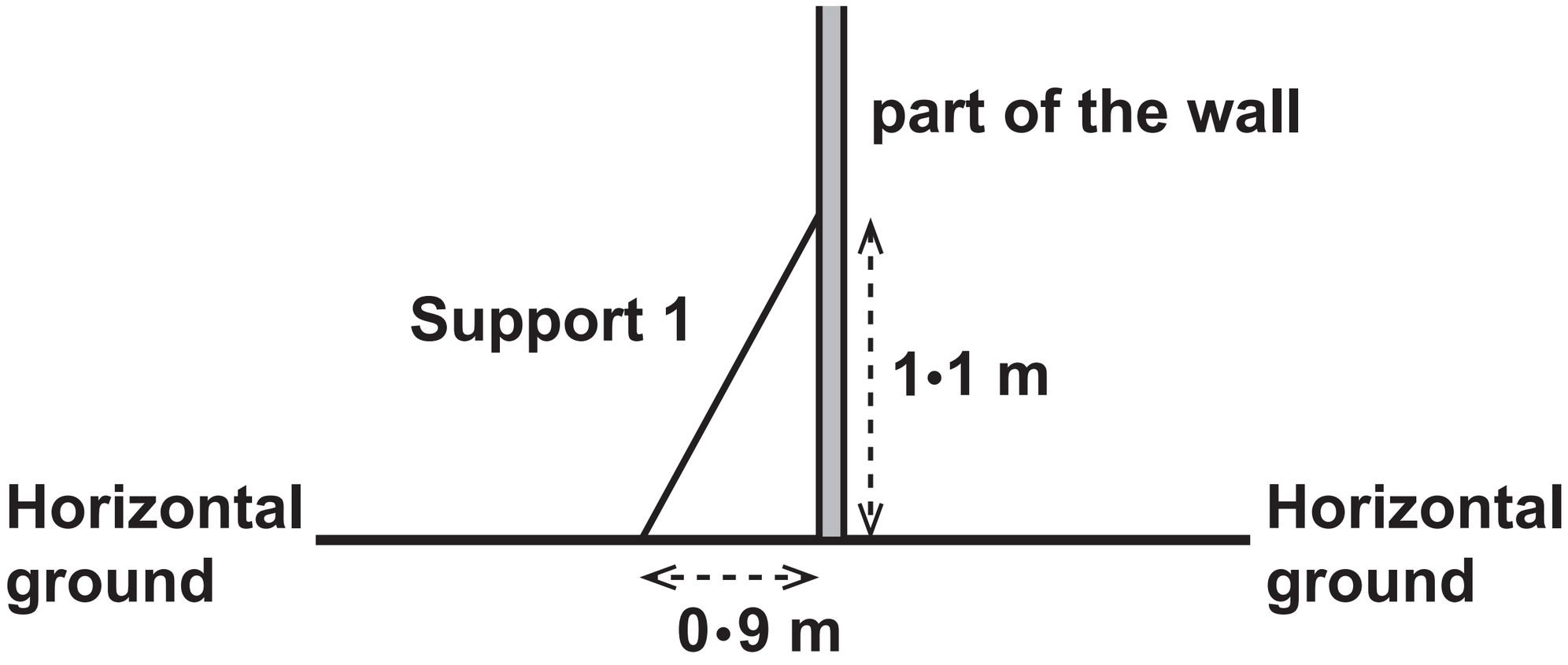
Diagram NOT drawn to scale



Question 9 (a) (i)

Diagram 9 (a) (i)

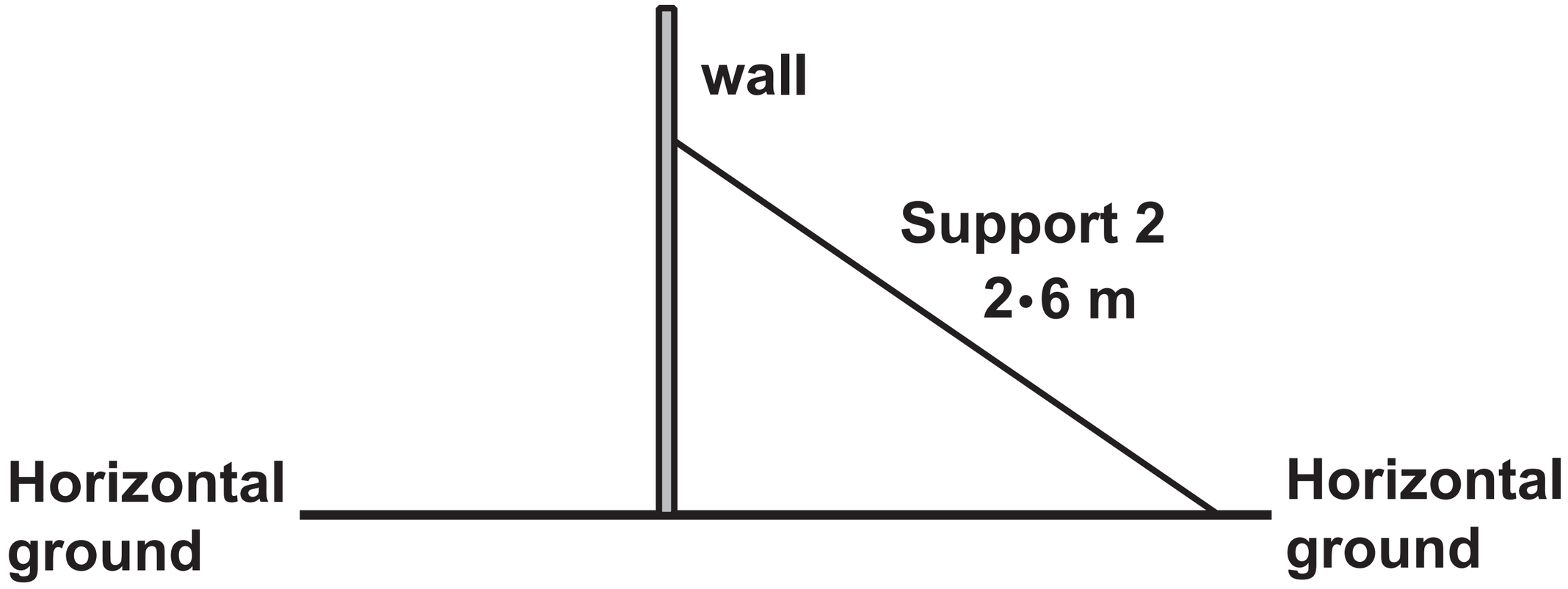
Diagram NOT drawn to scale



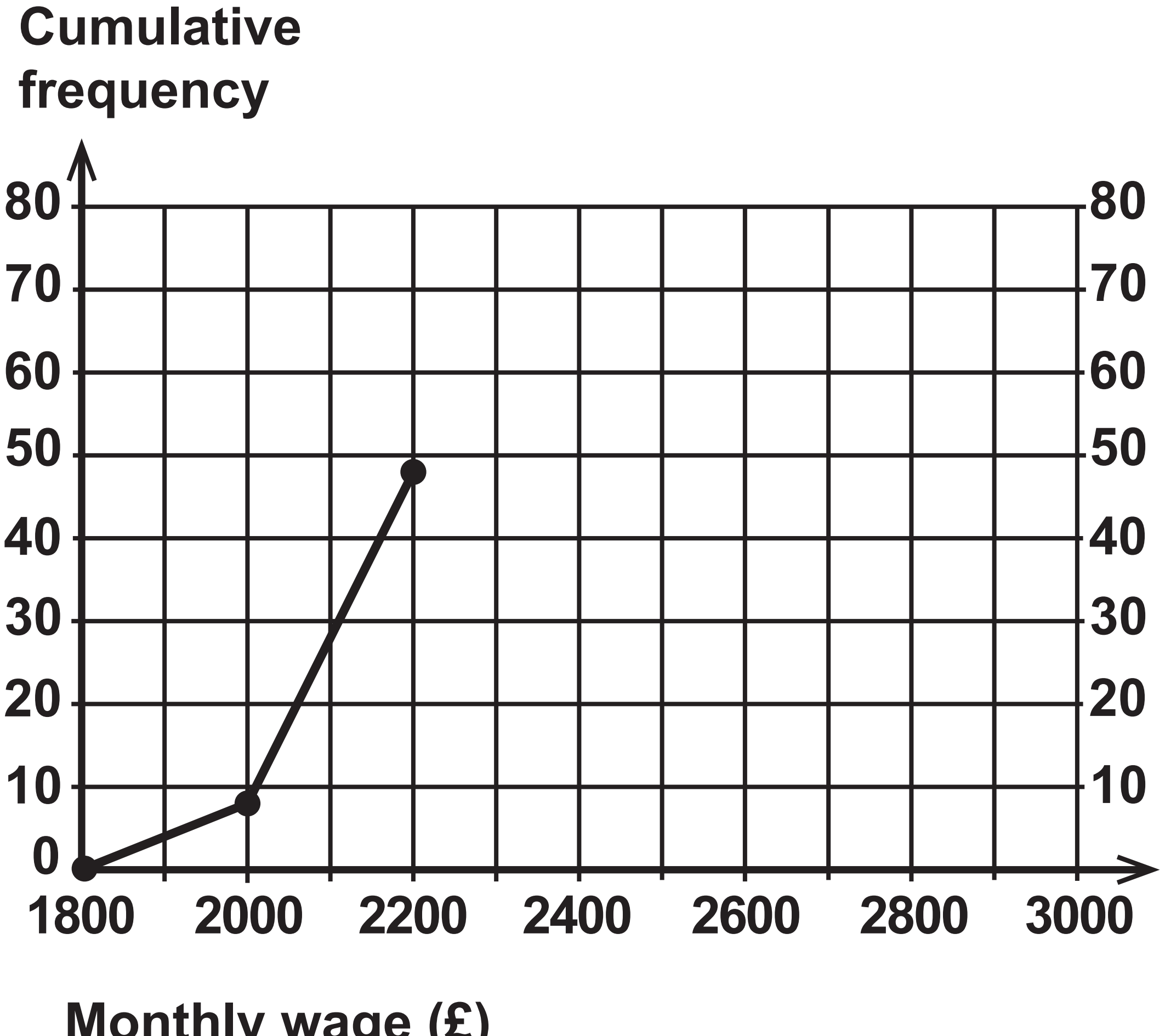
Question 9 (a) (ii)

Diagram 9 (a) (ii)

Diagram NOT drawn to scale



Question 10 (b) (i)



GCSE

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MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

THURSDAY, 9 MAY 2019 – MORNING

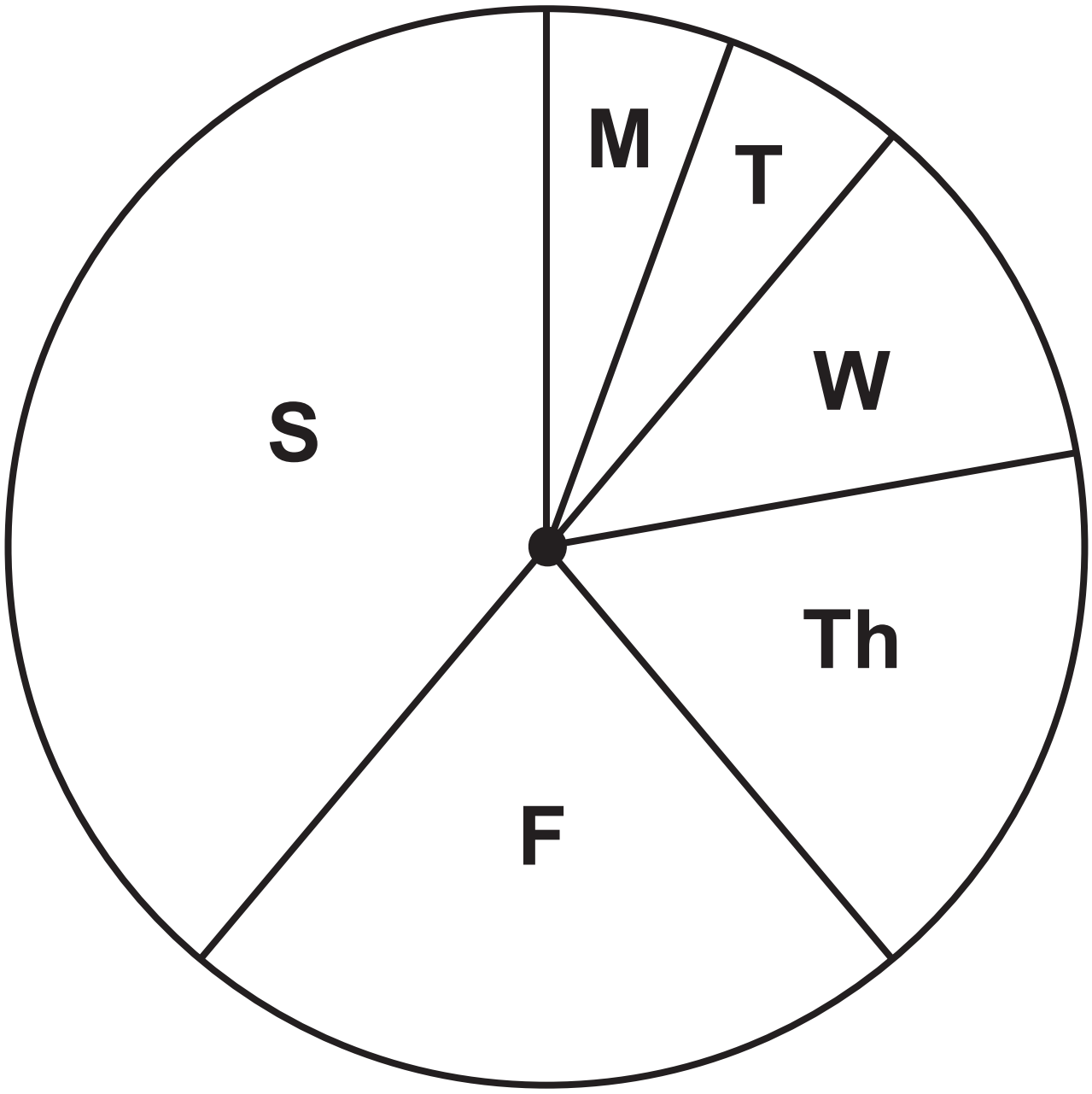
Spare Diagram Booklet

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	**0**

Question 1

Diagram 1
FFORDD OWAIN DAILY SUNGLASSES SALES FOR LAST WEEK

In total, 90 pairs of sunglasses were sold.



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Question 1

Diagram 2
ARTHUR AVENUE DAILY SUNGLASSES SALES FOR LAST WEEK

Key:  **represents 4 pairs of sunglasses**

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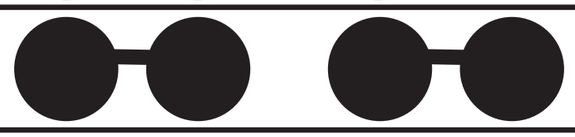
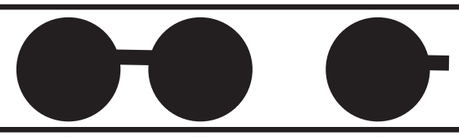
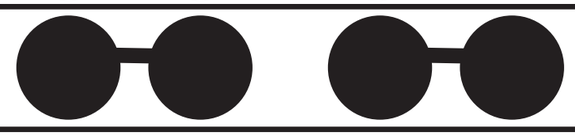
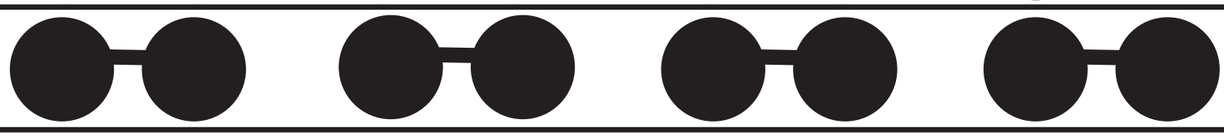
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

Question 3 (a)

Table

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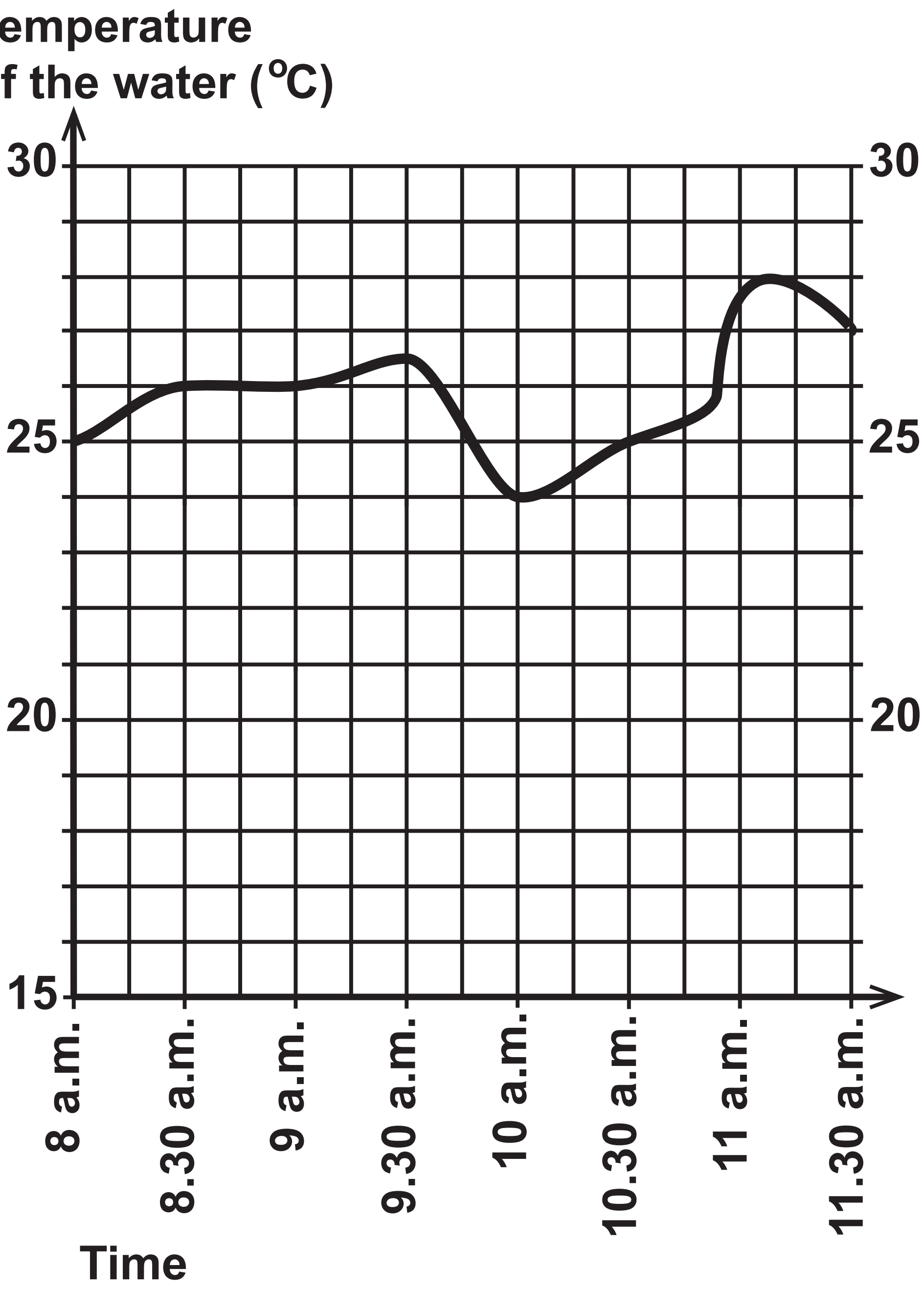
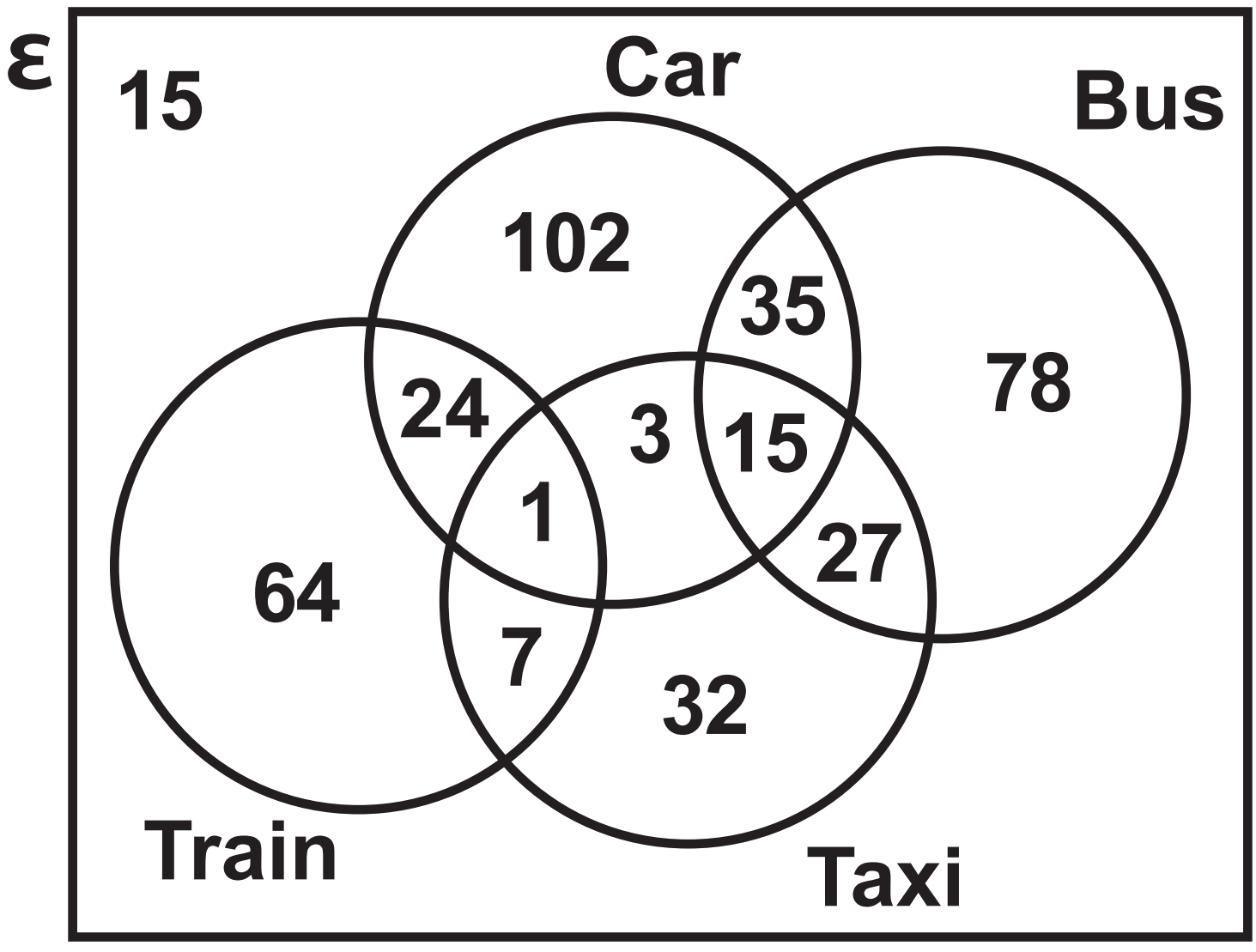
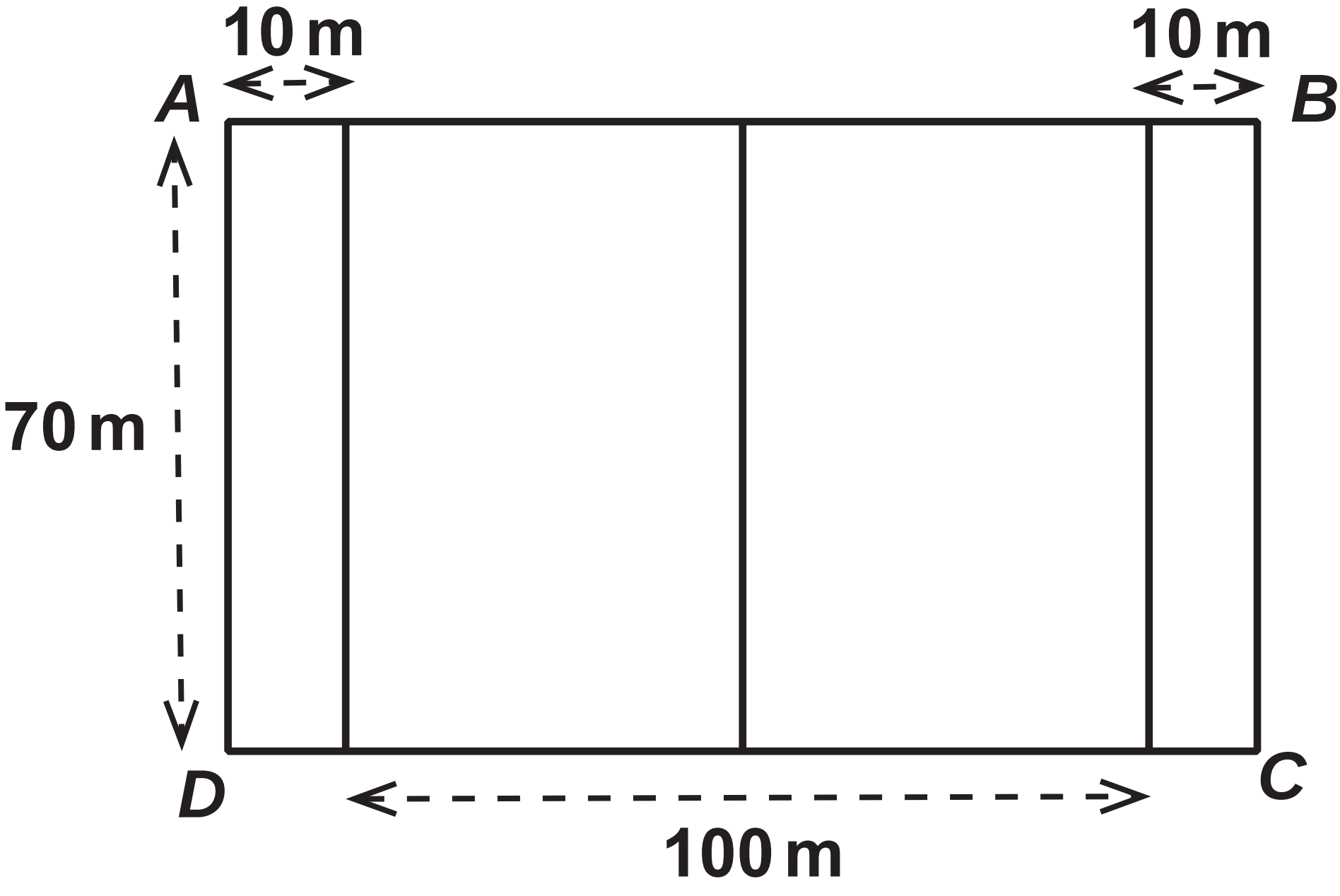

Temperature of the water (°C)
30
25
20
15
30
25
20
8 a.m.
8.30 a.m.
9 a.m.
9.30 a.m.
10 a.m.
10.30 a.m.
11 a.m.
11.30 a.m.
Time

Question 6 (a)



Question 6 (c)

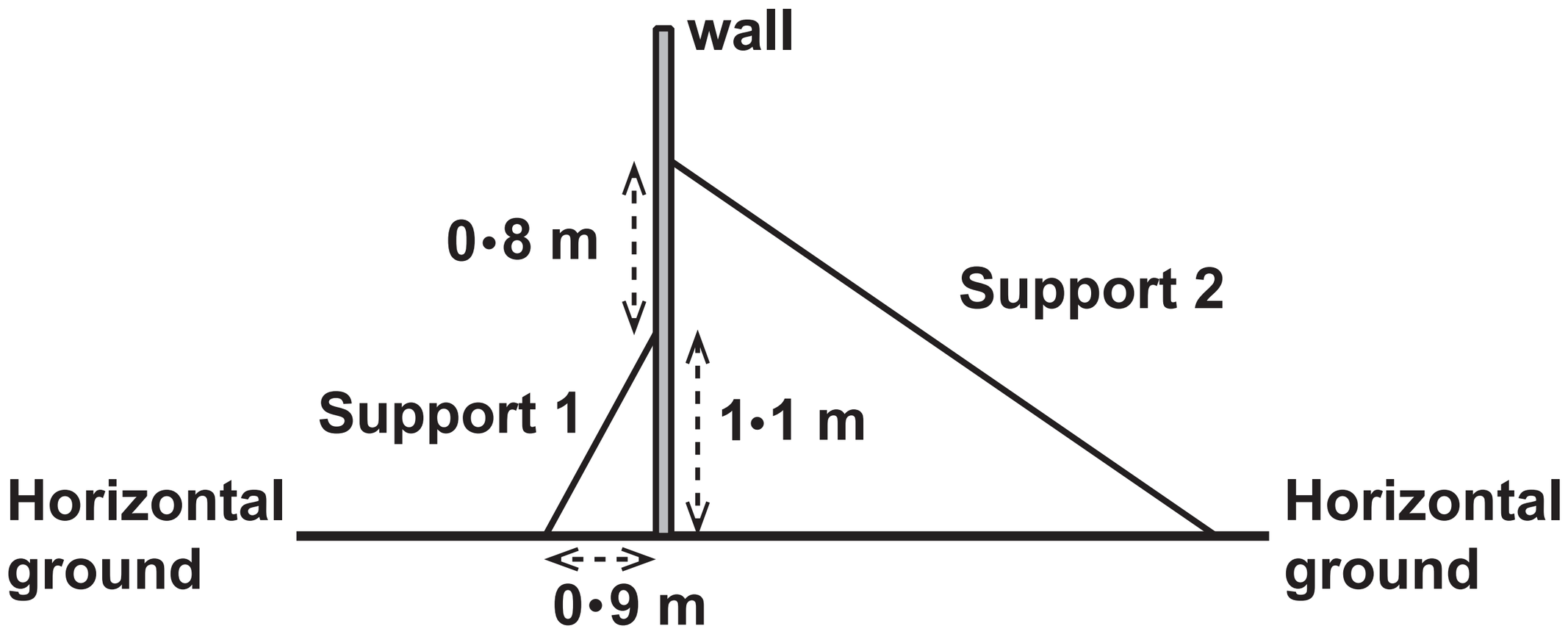
Diagram NOT drawn to scale



Question 9 (a)

Diagram 9 (a)

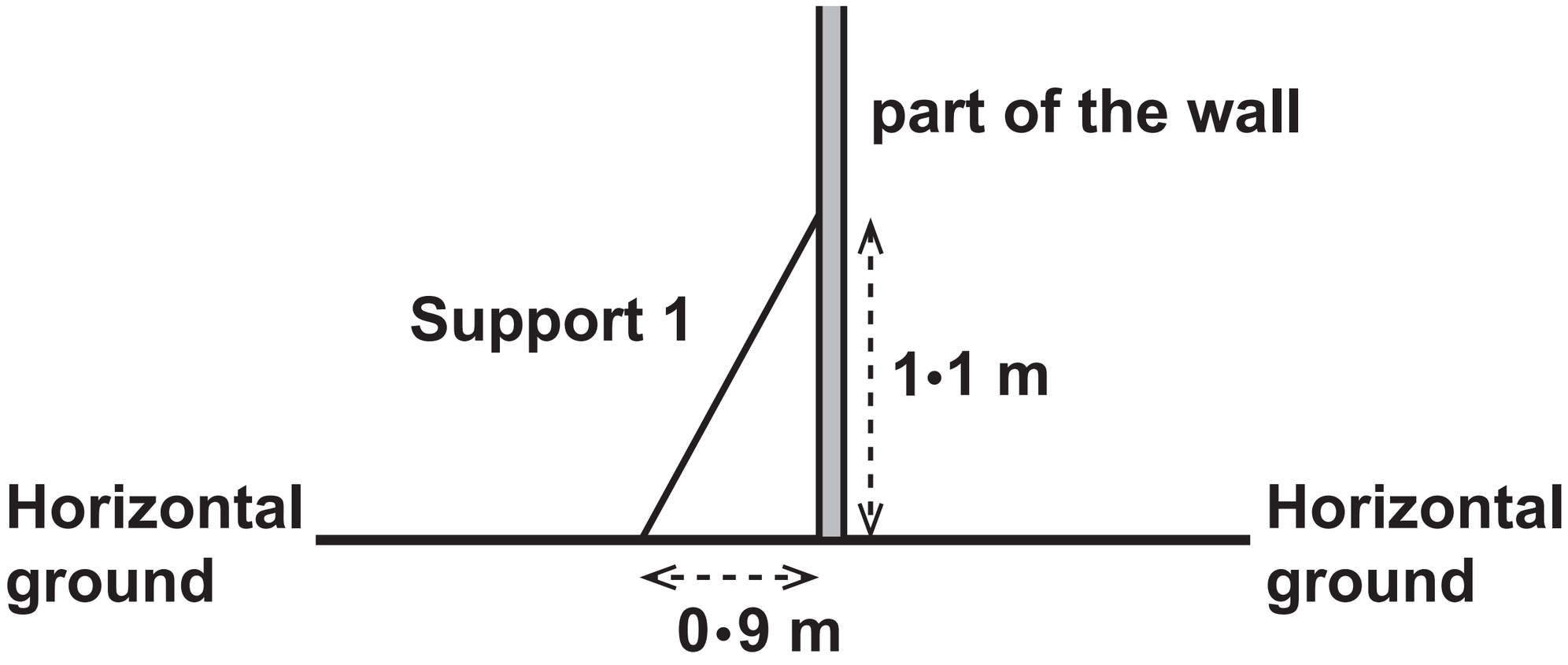
Diagram NOT drawn to scale



Question 9 (a) (i)

Diagram 9 (a) (i)

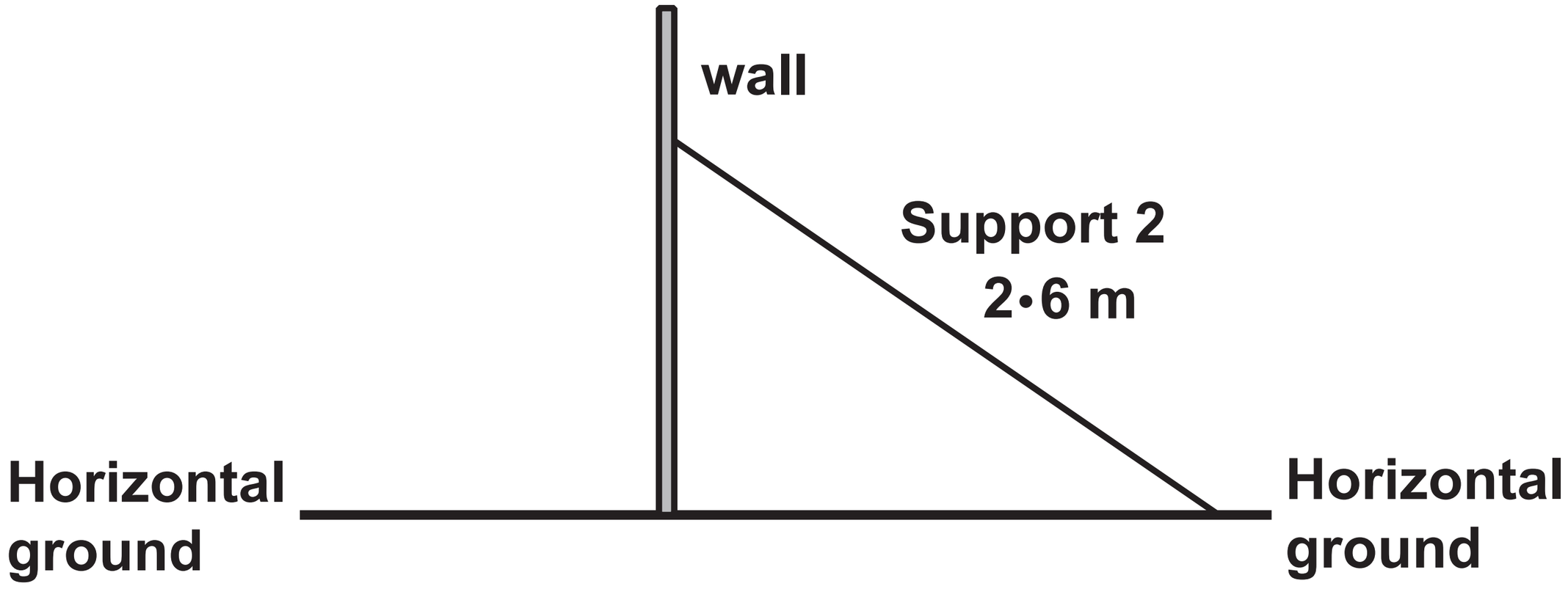
Diagram NOT drawn to scale



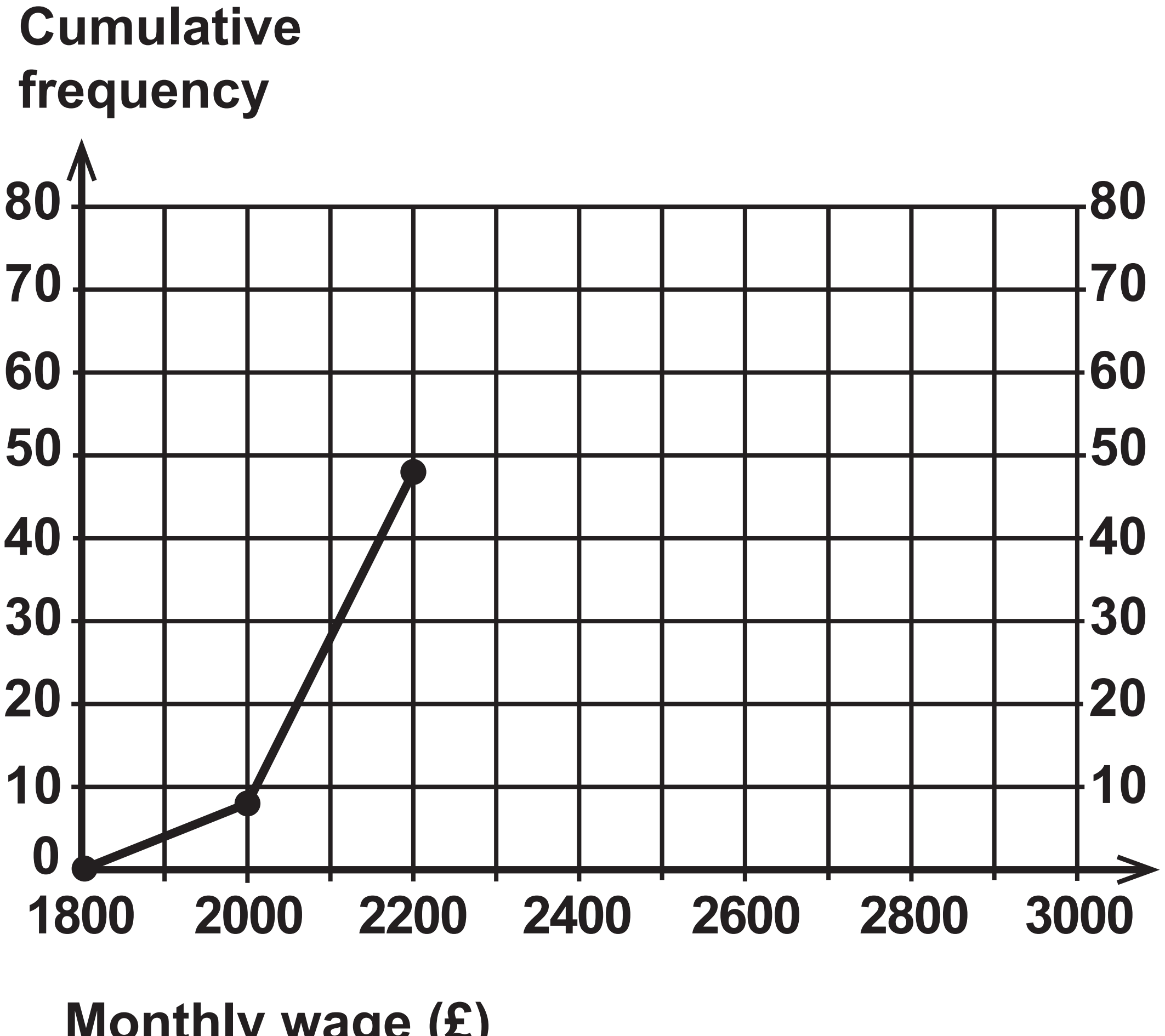
Question 9 (a) (ii)

Diagram 9 (a) (ii)

Diagram NOT drawn to scale



Question 10 (b) (i)



GCSE – NEW MATHEMATICS and NUMERACY

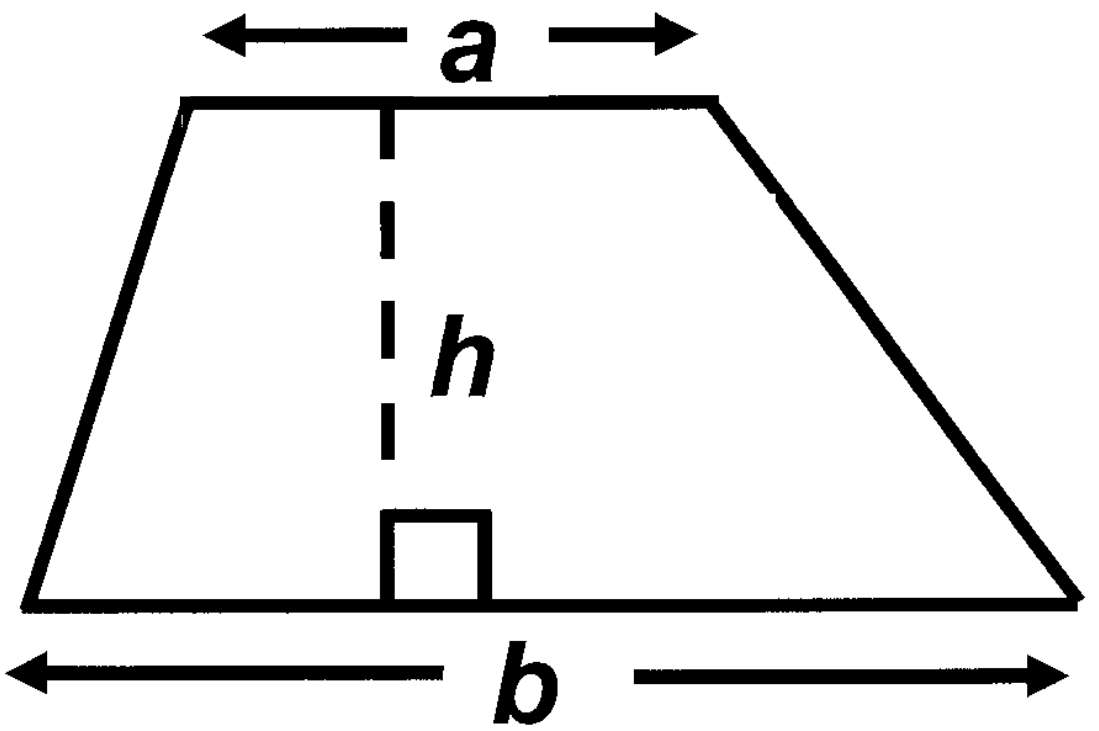
FORMULA LIST
INTERMEDIATE TIER
GCSE

You must not write on these formula pages.

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

Formula List – Intermediate Tier

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



Volume of prism =

area of cross – section × length