



GCSE

3310U50–1

TUESDAY, 5 NOVEMBER 2024 – MORNING

MATHEMATICS – NUMERACY

UNIT 1: NON – CALCULATOR

HIGHER TIER

**1 hour 45 minutes plus your additional
time allowance**

**THE USE OF A CALCULATOR IS NOT
PERMITTED IN THIS EXAMINATION**

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	7	
2.	2	
3.	6	
4.	5	
5.	8	
6.	6	
7.	7	
8.	10	
9.	13	
10.	9	
11.	7	
Total	80	

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 model for Question 4, Question 7 and Question 10 (b).

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, taking care to number the question(s) correctly.

Take π as $3 \cdot 14$

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

(Turn over)

1. IN THIS QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.

Gerallt is planning to go to the Maldives.

His local exchange shop:

- **sells 20 MALDIVIAN RUFIIYAA (MVR) for £1**
- **takes all possible British notes and coins**
- **sells MVR notes, but only has 500 MVR and 1000 MVR notes available.**

Gerallt has £360 to buy Maldivian rufiyaa (MVR).

continued on the next page . . .

(Turn over)

[5 marks + 2 marks OCW]

(Turn over)

2. Eleri is investigating whether people working in offices are happy with the processing speed of their office computer.

She considers the data she needs to collect.

Eleri includes the following two questions in her questionnaire.

For each question, write down one set of possible groups she could use as answer options.

Question 1: “How many days per month do you work in your office?”

Possible groups for answer:

Question 2: “How happy are you with the processing speed of your office computer?”

Possible groups for answer:

[2 marks]

(Turn over)

3. Look at the table for Question 3 in the separate Diagram Booklet. The table shows information about income tax rates.

Jamal is paid in dollars.

The income tax rates are shown in the table.

Jamal's total earnings before tax are 36 000 dollars.

Calculate how much tax Jamal is due to pay in total.

You must show all your working.

4. **Ask for the model for Question 4.
The model is NOT to scale. The model represents a fire surround that is made from concrete.**

The fire surround has a uniform cross – section.

The edges of the fire surround are all either horizontal or vertical, as shown in the model.

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

The diagram is NOT drawn to scale.

The diagram shows the uniform cross – section of the fire surround.

continued on the next page . . .

(Turn over)

Question 4 continued

In the diagram:

$$**AB = 160 \text{ cm}**$$

$$**BC = AH = 100 \text{ cm}**$$

$$**CD = HG = 15 \text{ cm}**$$

$$**FG = ED = 60 \text{ cm}**$$

The volume of the concrete in the fire surround is $164\,000 \text{ cm}^3$

Calculate the depth of the fire surround.

Give your answer in centimetres.

You must show all your working.

(Turn over)

Depth of fire surround

is _____ **cm**

[5 marks]

(Turn over)

AMOUNT in Delia's account after two years £ _____

[3 marks]

continued on the next page . . .

(Turn over)

Question 5 continued

5. (b) Delia bought a gold bracelet at a car boot sale a few years ago.

**(i) Delia's bracelet has increased in value by 40%
Her gold bracelet is now worth £42**

Calculate how much Delia paid for the bracelet in the car boot sale.

(Turn over)

Delia paid £ _____

[2 marks]

continued on the next page . . .

(Turn over)

[3 marks]

(Turn over)

6. Look at the diagrams for Question 6 in the separate Diagram Booklet. The diagrams show three box–and–whisker diagrams.

Geraint has collected data on some adult gulls.

He weighed 400 slender–billed gulls, 400 little gulls, and 400 black–headed gulls.

He has constructed three box–and–whisker diagrams to display the masses of the gulls.

Diagram 1 – Slender–billed gulls,

Diagram 2 – Little gulls and

Diagram 3 – Black–headed gulls.

continued on the next page . . .

(Turn over)

Question 6 continued

6. (a) What is the range of the masses of the slender-billed gulls?

Range of the masses _____ g
[1 mark]

continued on the next page . . .

(Turn over)

Question 6 continued

6. (b) How many of the little gulls have a mass greater than or equal to 95 g?

[2 marks]

continued on the next page . . .

(Turn over)

Question 6 continued

- 6. (c) Write down the percentage of little gulls that have a mass greater than or equal to 170 g.**

_____ %

[1 mark]

continued on the next page . . .

(Turn over)

Question 6 continued

6. (d) From the box–and–whisker diagrams, Geraint notices that two of the types of gull have the same median mass.

He makes the following statement about these two types of gull.

“The diagrams suggest that one of these two types of gull generally has a greater mass than the other.”

(i) Which type of gull appears to have the greater mass?

[1 mark]

continued on the next page . . .

(Turn over)

Question 6 (d) continued

6. (d) (ii) Geraint based his statement on ONE of the following measures.

Which measure did Geraint use?

Circle your answer.

Range
Median
Lowest mass
Lower quartile
Upper quartile

[1 mark]

(Turn over)

- 7. Ask for the model for Question 7.
The model is NOT to scale. The model represents a shipping container. Shipping containers are used to transport goods around the world. The dimensions of a shipping container are as follows:**
- The height is 2.59 m, correct to the nearest centimetre.**
 - The width is 2.43 m, correct to the nearest centimetre.**
 - The length is approximately double the width.**

continued on the next page . . .

(Turn over)

Question 7 continued

7. (a) What is the least possible **WIDTH** of this shipping container?
Circle your answer.

2.425 m
2.42 m
2.435 m
2.426 m
2.424 m

[1 mark]

continued on the next page . . .

(Turn over)

Question 7 continued

- 7. (b) Look at the diagram for Question 7 (b) in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram shows an end view of a stack of these shipping containers.**

Calculate the greatest possible HEIGHT of the stack of shipping containers.

Give your answer in metres.

(Turn over)

[3 marks]

continued on the next page . . .

(Turn over)

Question 7 continued

7. (c) In 2012, there were 2×10^7 shipping containers in the world.

Joshua says,

By 2025, I think that the number of shipping containers in the world will reach 1.2×10^8

Assuming Joshua is correct, complete the statement below.

“By 2025, the percentage increase in the number of shipping containers in the world since 2012 will be _____ %”

continued on the next page . . .

(Turn over)

35

[3 marks]

(Turn over)

8. Look at the diagram for Question 8 in the separate Diagram Booklet.

The diagram is a histogram.

Nerys is a member of a junior athletics club.

She measured the heights, in centimetres, of all the 16-year-old girl athletes in the club.

Nerys drew this histogram of the results.

(a) (i) Show that the number of 16-year-old girls in the athletics club is 25

(Turn over)

[3 marks]

continued on the next page . . .

(Turn over)

[3 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

8. (b) Look at the table for Question 8 (b) in the separate Diagram Booklet. Grace is a member of the same junior athletics club.

She uses Nerys's histogram to draw a different histogram.

Grace uses the groups shown in the table.

(i) Complete Grace's table.

(Turn over)

[2 marks]

- 8. (b) (ii) Using the graph paper provided for Question 8 (b) (ii) in the separate Diagram Booklet, draw Grace's histogram.**

[2 marks]

(Turn over)

- 9. Look at the diagram for Question 9 in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram represents a clothes hanger.**

Hang – Up is a company that makes clothes hangers.

One type of hanger is made from a single length of metal wire that is bent to form the hanger.

continued on the next page . . .

(Turn over)

Question 9 continued

9. (a) (i) The design for the main part of the hanger is shown in the diagram.

This part of the hanger is symmetrical.

It has straight sections of length 24 cm and 38 cm.

It also has curved sections that are arcs of a circle of radius 3 cm.

The angle between the two radii shown in the diagram is 150°

continued on the next page . . .

(Turn over)

[4 marks]

continued on the next page . . .

(Turn over)

Question 9 (a) continued

9. (a) (ii) The length of wire needed for the hooked part of this hanger is $0 \cdot 1\dot{3}$ of the total length of wire needed for a hanger.

Write $0 \cdot 1\dot{3}$ as a fraction in its simplest form.

(Turn over)

[3 marks]

continued on the next page . . .

(Turn over)

Question 9 continued

- 9. (b) Hang – Up makes metal hangers in batches of 80
Every 3 hours, it randomly samples 8 hangers from one batch of 80 for quality assurance.**

Look at the list of numbers for Question 9 (b) in the separate Diagram Booklet. The numbers are taken from a table of random digits.

Use these numbers to choose 8 hangers from a batch of 80 hangers.

You must start with the first number in the list.

continued on the next page . . .

(Turn over)

Hangers chosen:

[3 marks]

continued on the next page . . .

(Turn over)

Question 9 continued

- 9. (c) Look at the diagram for Question 9 (c) in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram shows two plastic hangers.**

Hang – Up also makes plastic hangers of various sizes.

Two of its plastic hangers have main parts that are mathematically similar.

These are shown in the diagram.

continued on the next page . . .

(Turn over)

[3 marks]

(Turn over)

10. (a) Square – Off is a company that has designed new offices for its workers.

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

The diagram shows a plan view of Square – Off’s new offices.

continued on the next page . . .

(Turn over)

Question 10 (a) continued

The main building has a square floor with an area of 500 m^2

The reception has a square floor with an area of 80 m^2

The triangular region outside the buildings is paved.

A plan view of the buildings and the paved region is shown in the diagram.

continued on the next page . . .

(Turn over)

Question 10 (a) continued

- 10. (a) (i) Calculate the total length of the two buildings.
Give your answer in the form $a\sqrt{b}$,
where a and b are integers
and b is a prime number.**

[3 marks]**continued on the next page . . .****(Turn over)**

Question 10 (a) continued

**10. (a) (ii) Calculate the area of the paved region.
You must show all your working.**

[2 marks]

continued on the next page . . .

(Turn over)

Question 10 continued

10. (b) Square – Off has designed an entrance to the reception. Ask for the model for Question 10 (b). The model is NOT to scale. The model represents the entrance to the office reception.

The symmetrical structure is made from 3 connected metal sheets, each in the shape of a trapezium, as shown in the model.

Look at the diagram for Question 10 (b) in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram is a front view of the entrance to the office reception.

continued on the next page . . .

(Turn over)

Question 10 (b) continued

In the diagram:

$$**AC = 6 \cdot 5 \text{ metres}**$$

$$**BD = 4 \cdot 5 \text{ metres}**$$

$$**AE = 4 \cdot 3 \text{ metres}**$$

$$**BF = 2 \cdot 3 \text{ metres}**$$

The 3 metal sheets are connected to each other along the edges *AB* and *CD*.

Adhesive strips are needed along the entire length of these edges.

Calculate the length of the adhesive strip *AB*.

Leave your answer as a surd.

(Turn over)

61

[4 marks]

(Turn over)

11. Look at the diagram for Question 11 in the separate Diagram Booklet.

The diagram is a velocity – time graph.

Ravi is driving his car to work.

He brakes sharply to stop at a set of traffic lights.

The velocity – time graph shows the last 5 seconds of his journey before the car stops at the lights.

(a) (i) Using 5 strips of equal width, calculate an estimate of the distance the car travelled in these 5 seconds.

[3 marks]

continued on the next page . . .

(Turn over)

11. (a) (ii) Is your answer to part (a) (i) an overestimate or an underestimate? You must give a reason for your answer.

[1 mark]

continued on the next page . . .

(Turn over)

[3 marks]

END OF PAPER
TOTAL 80 MARKS

(Turn over)



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**MATHEMATICS – NUMERACY
UNIT 1: NON – CALCULATOR
HIGHER TIER**

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

Diagram Booklet

Surname: _____

First name(s): _____

Centre Number: _____

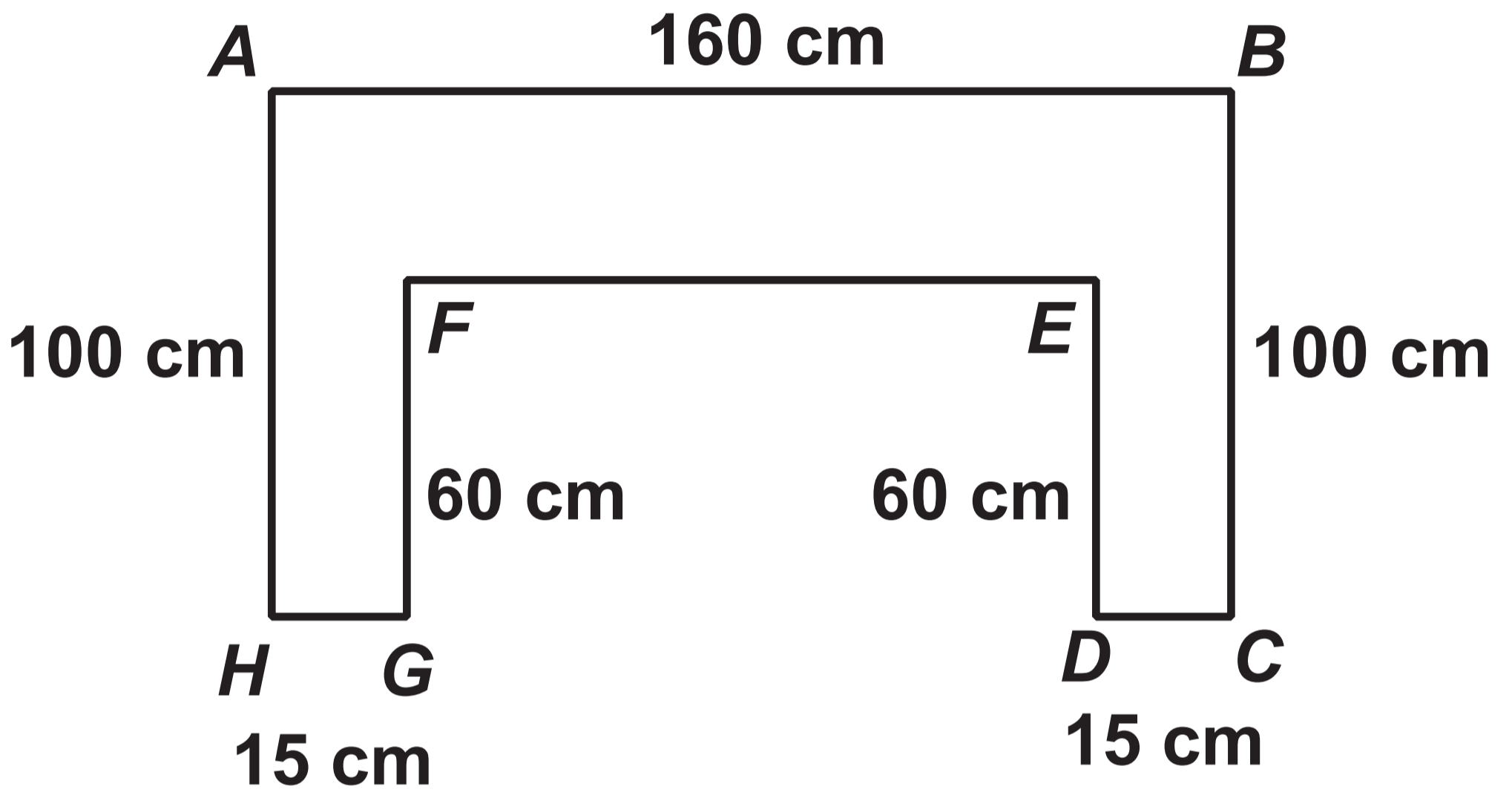
Candidate Number: 0 _____

Question 3

Band	Taxable income	Tax rate
Personal allowance	Up to 10 000 dollars	0%
Basic rate	10 000 dollars to 30 000 dollars	10%
Higher rate	Over 30 000 dollars	25%

Question 4

Diagram NOT drawn to scale



Question 6

Diagram 1

Slender-billed gulls

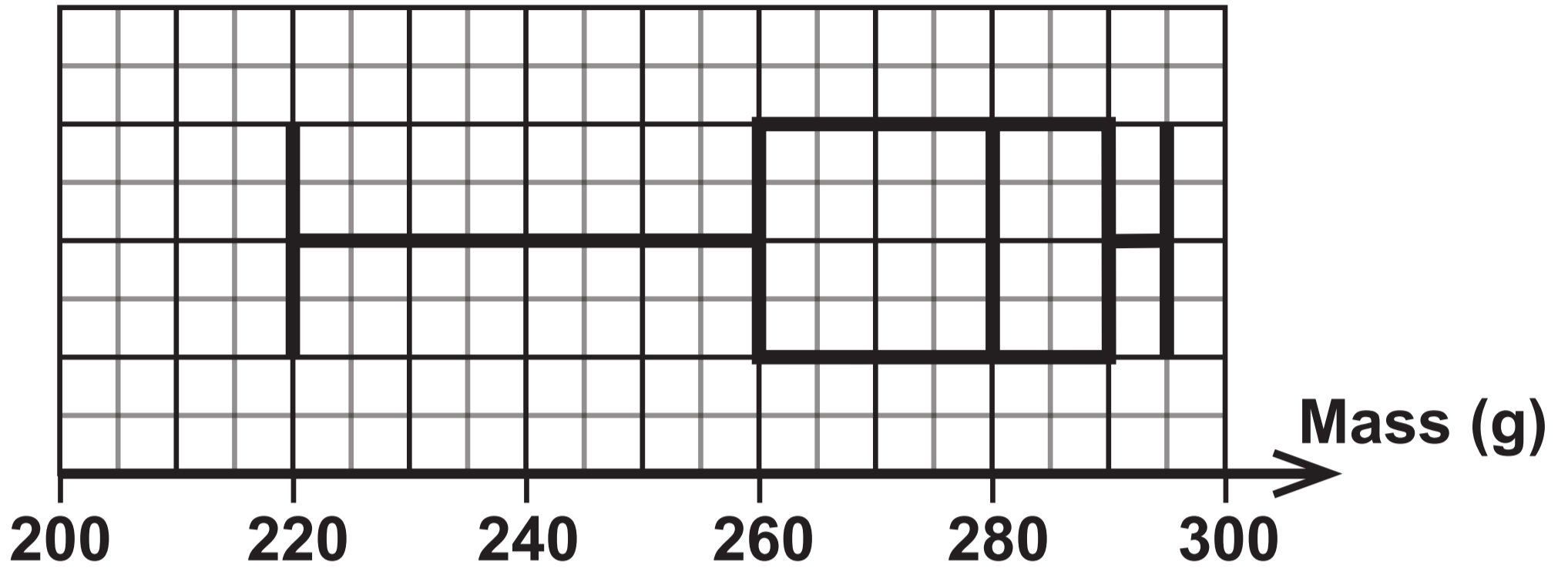


Diagram 2

Little gulls

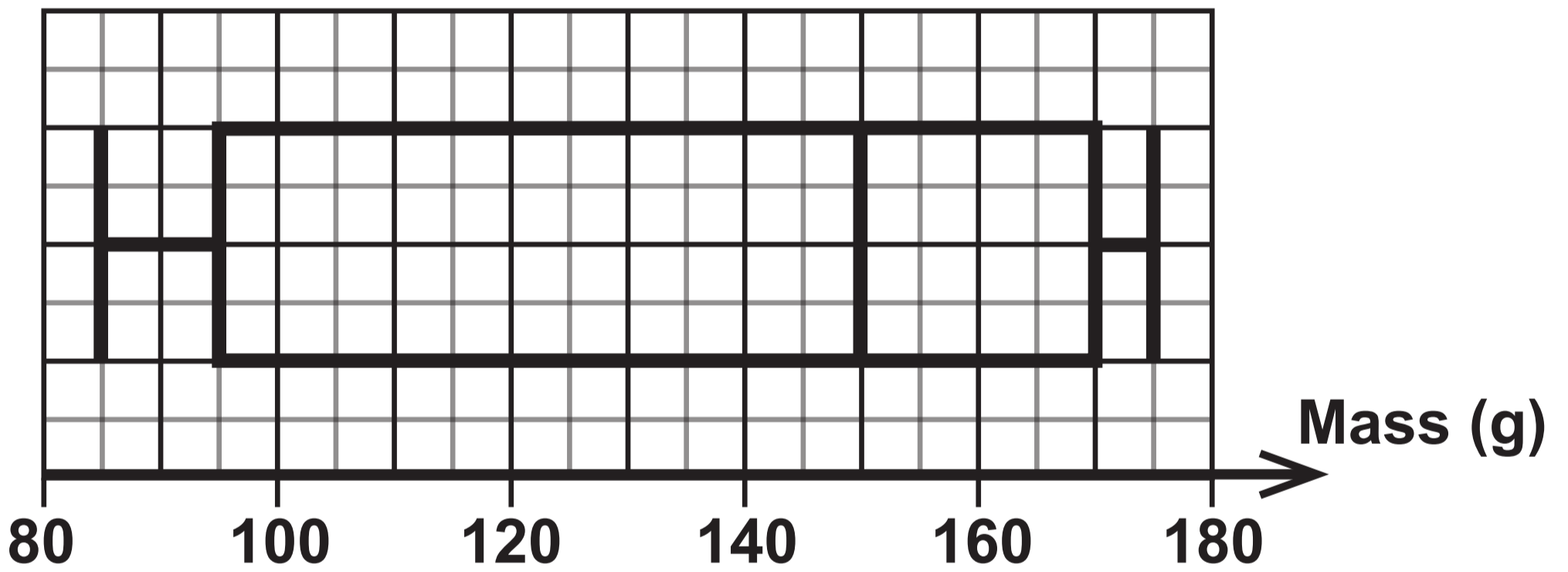
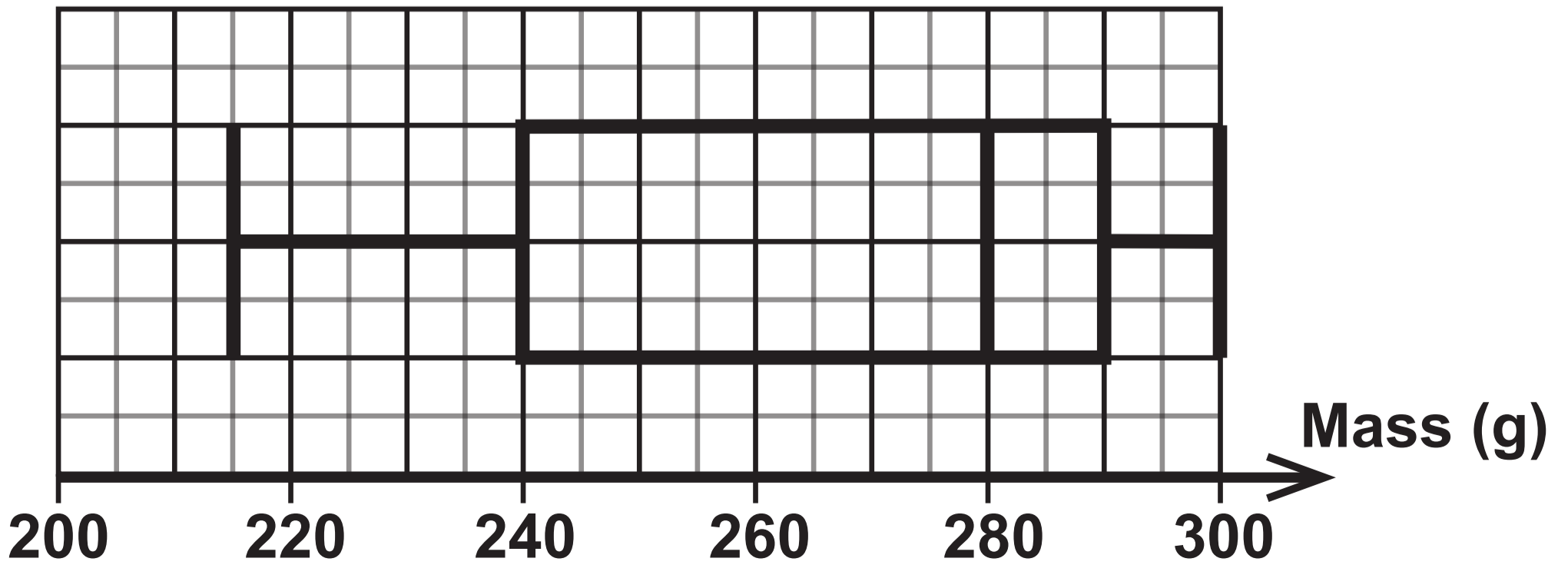



Diagram 3

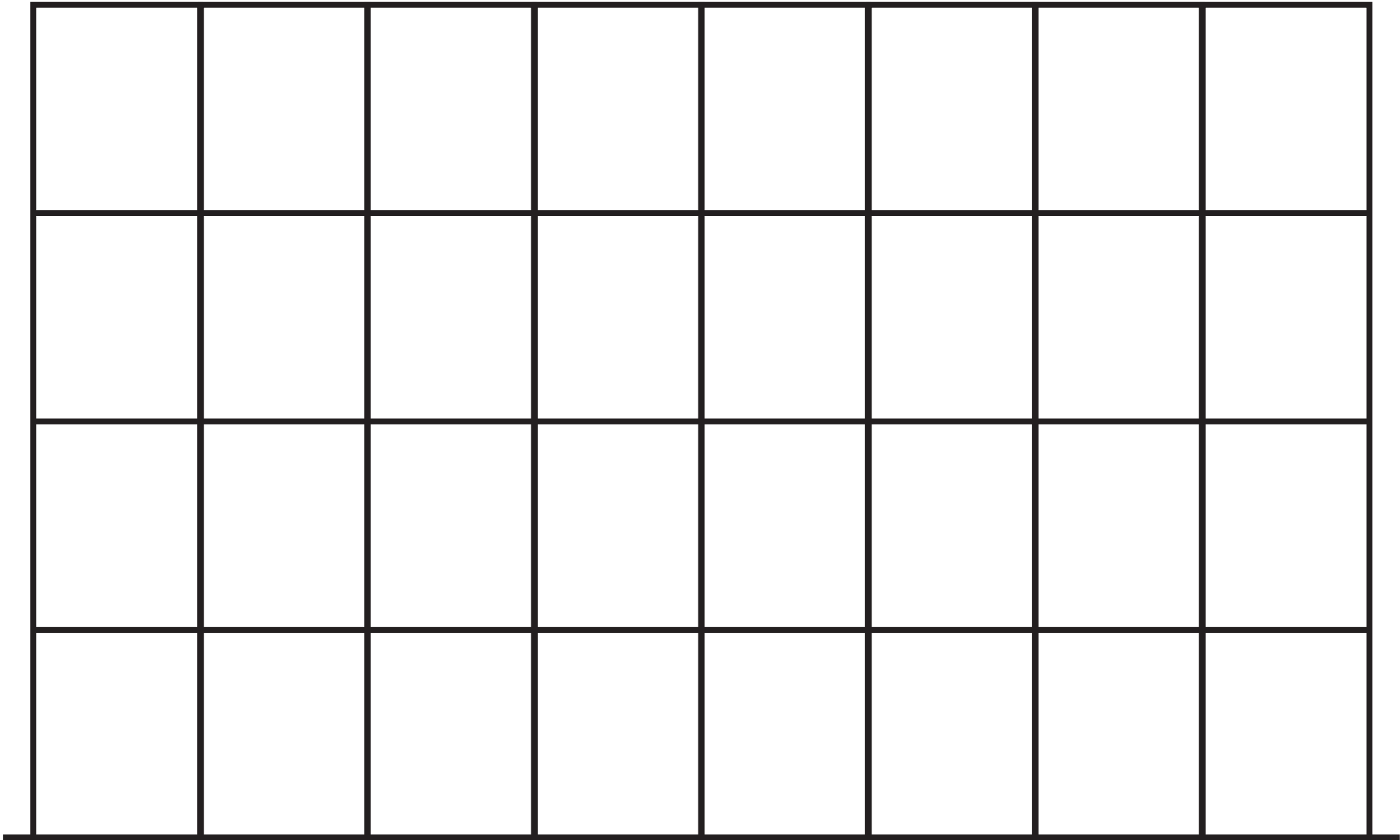
Black-headed gulls



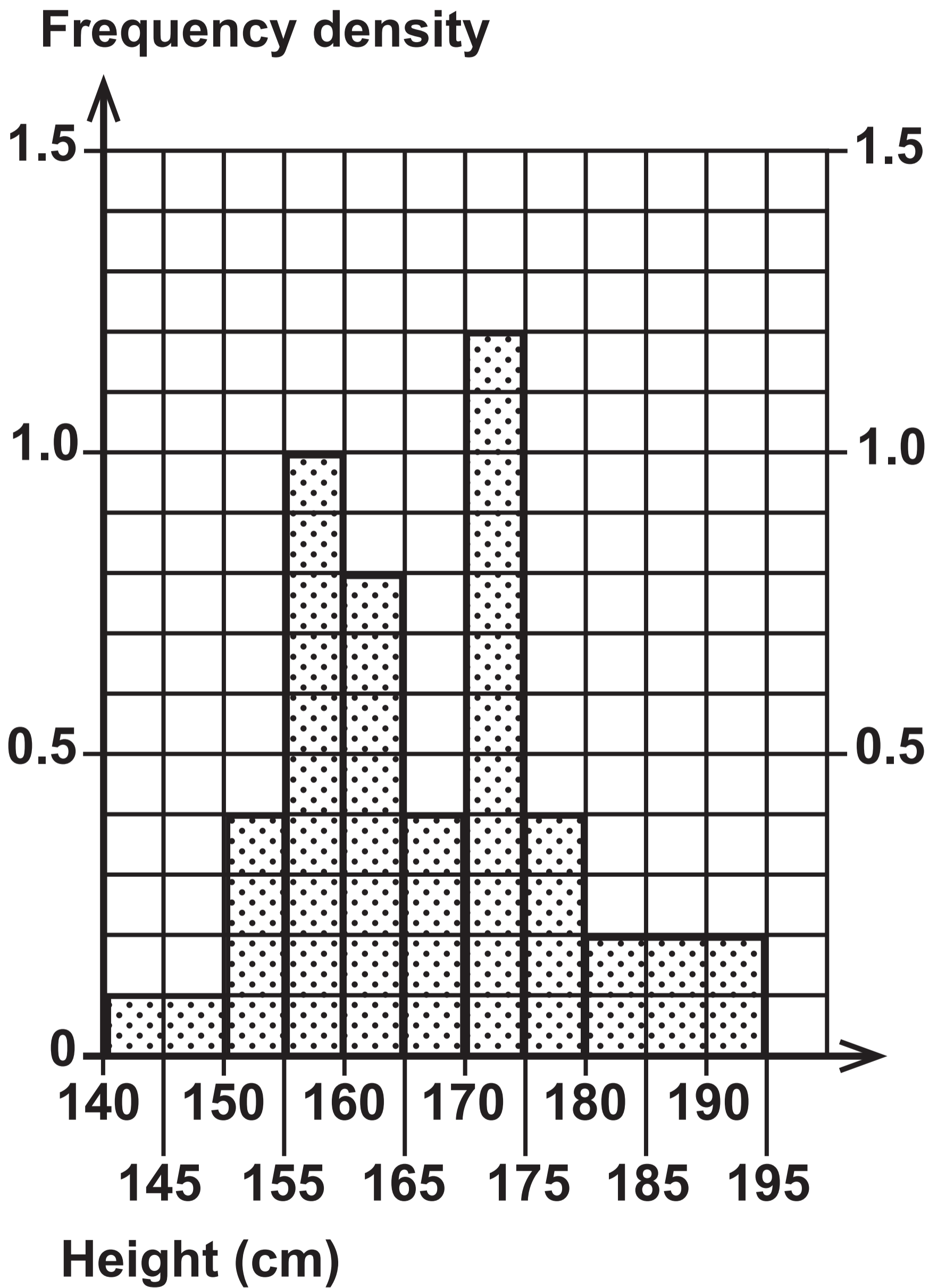
Question 7 (b)

Diagram NOT drawn to scale

Key:  = Container



Question 8

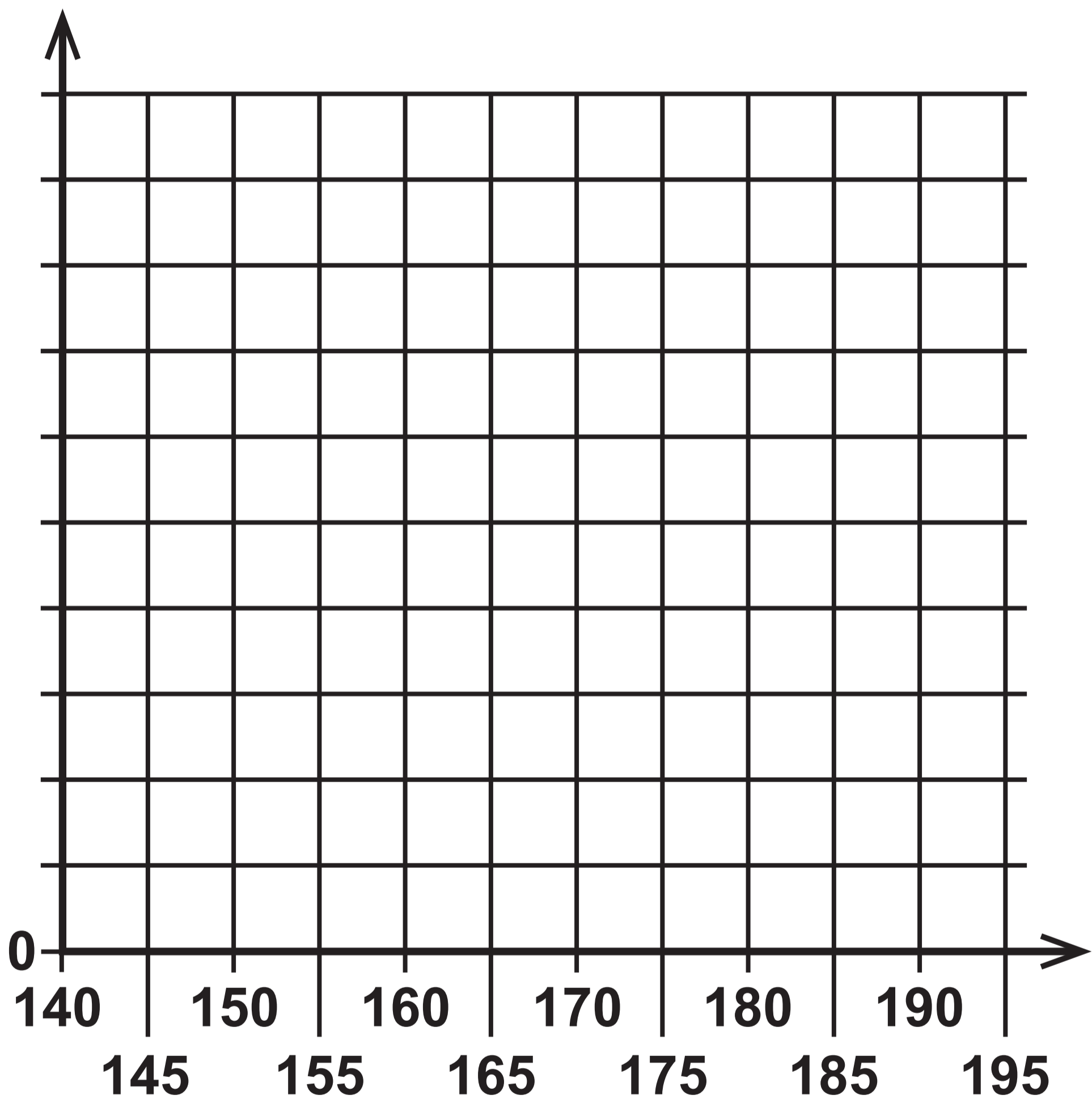


Question 8 (b)

Height (cm)	Frequency	Frequency density
$140 \leq \text{height} < 155$		
$155 \leq \text{height} < 165$		
$165 \leq \text{height} < 175$		
$175 \leq \text{height} < 195$		

Question 8 (b) (ii)

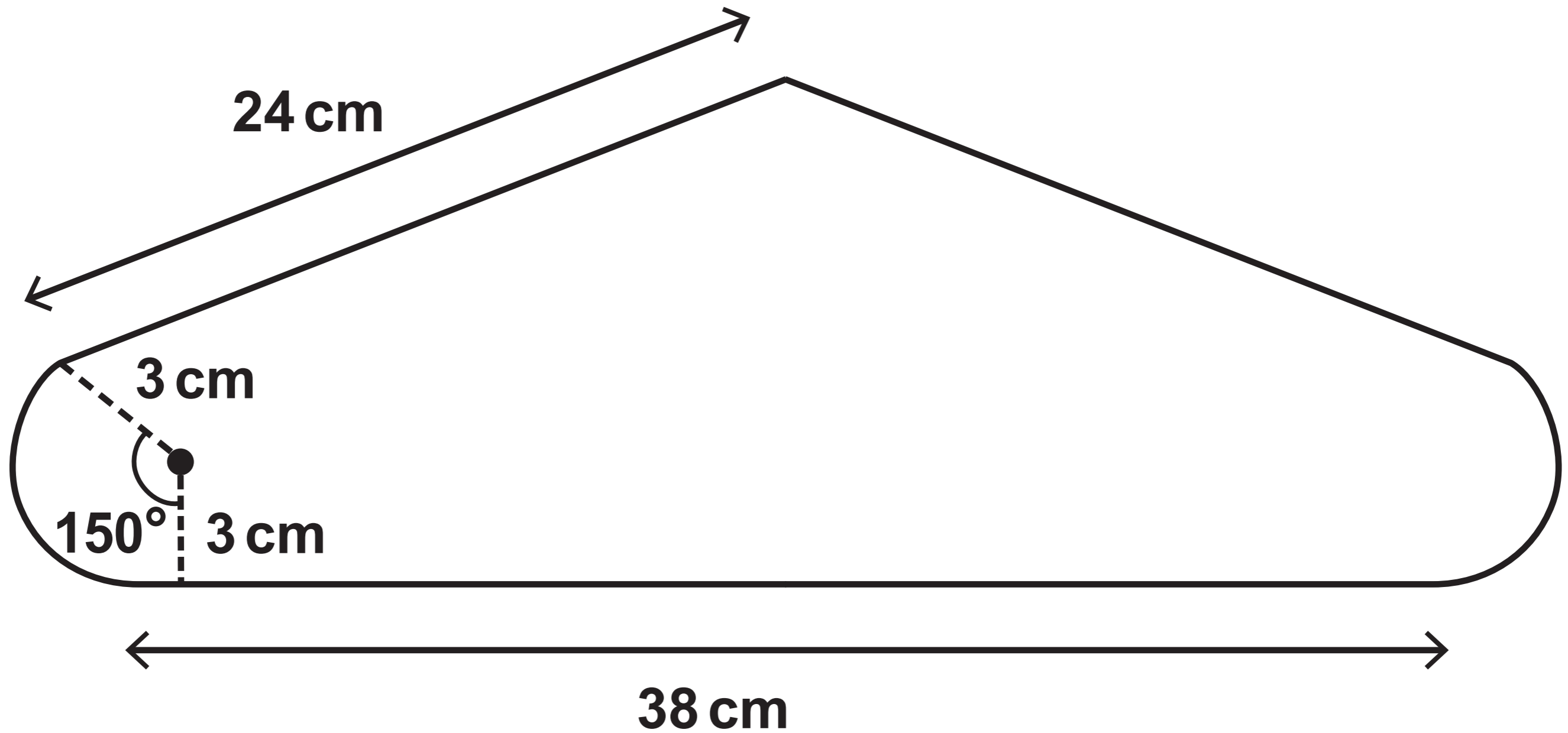
Frequency density



Height (cm)

Question 9

Diagram NOT drawn to scale



Question 9 (b)

299986

890791

810130

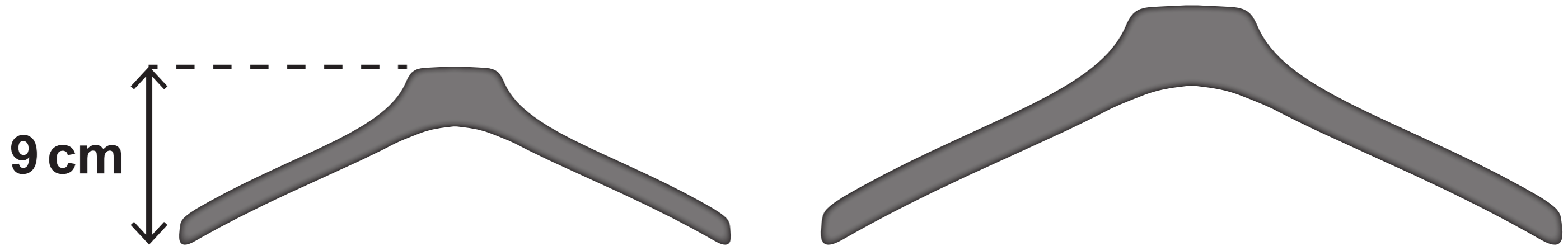
955579

268884

301244

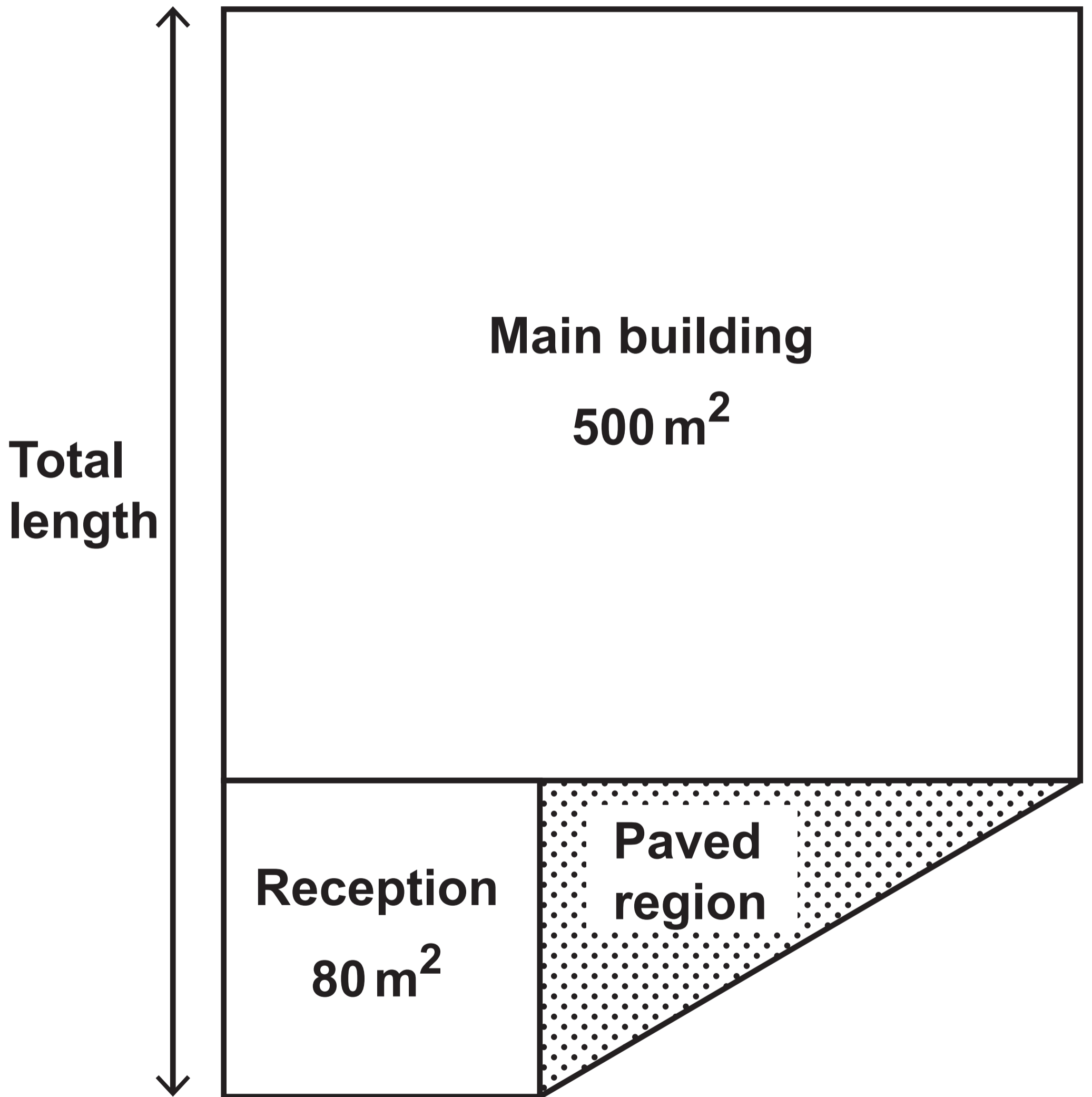
Question 9 (c)

Diagram NOT drawn to scale



Question 10 (a)

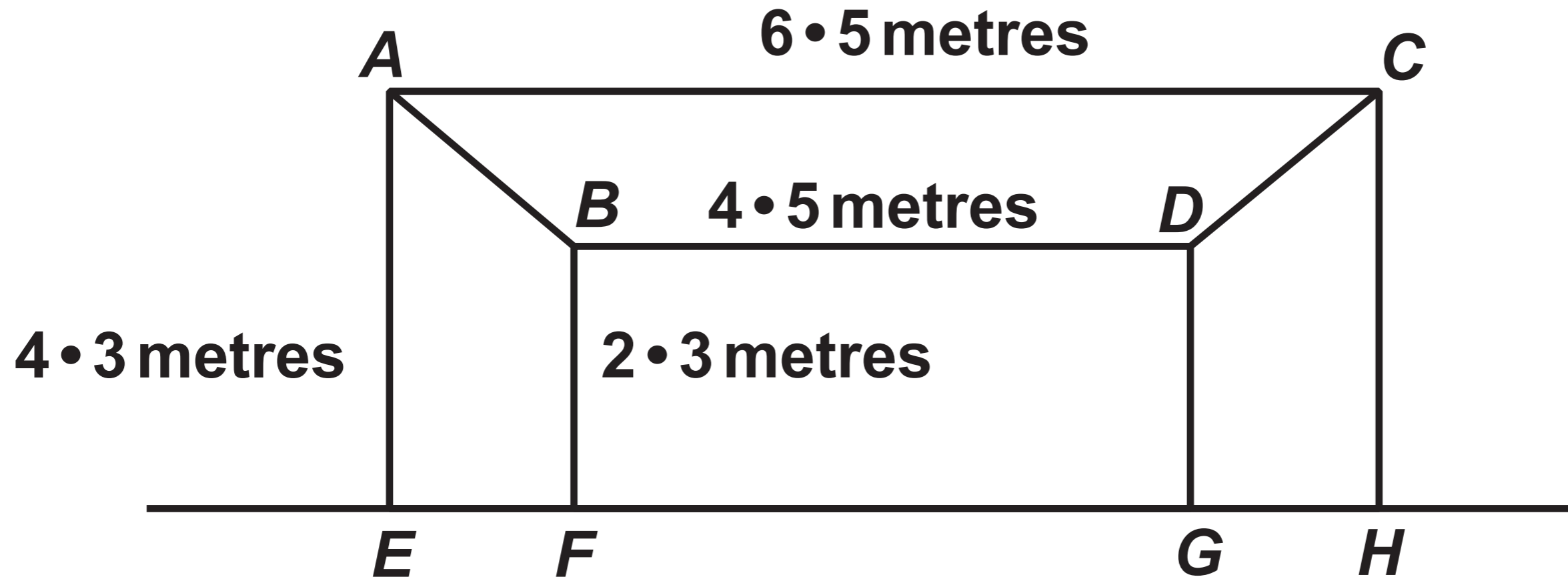
Diagram NOT drawn to scale



Question 10 (b)

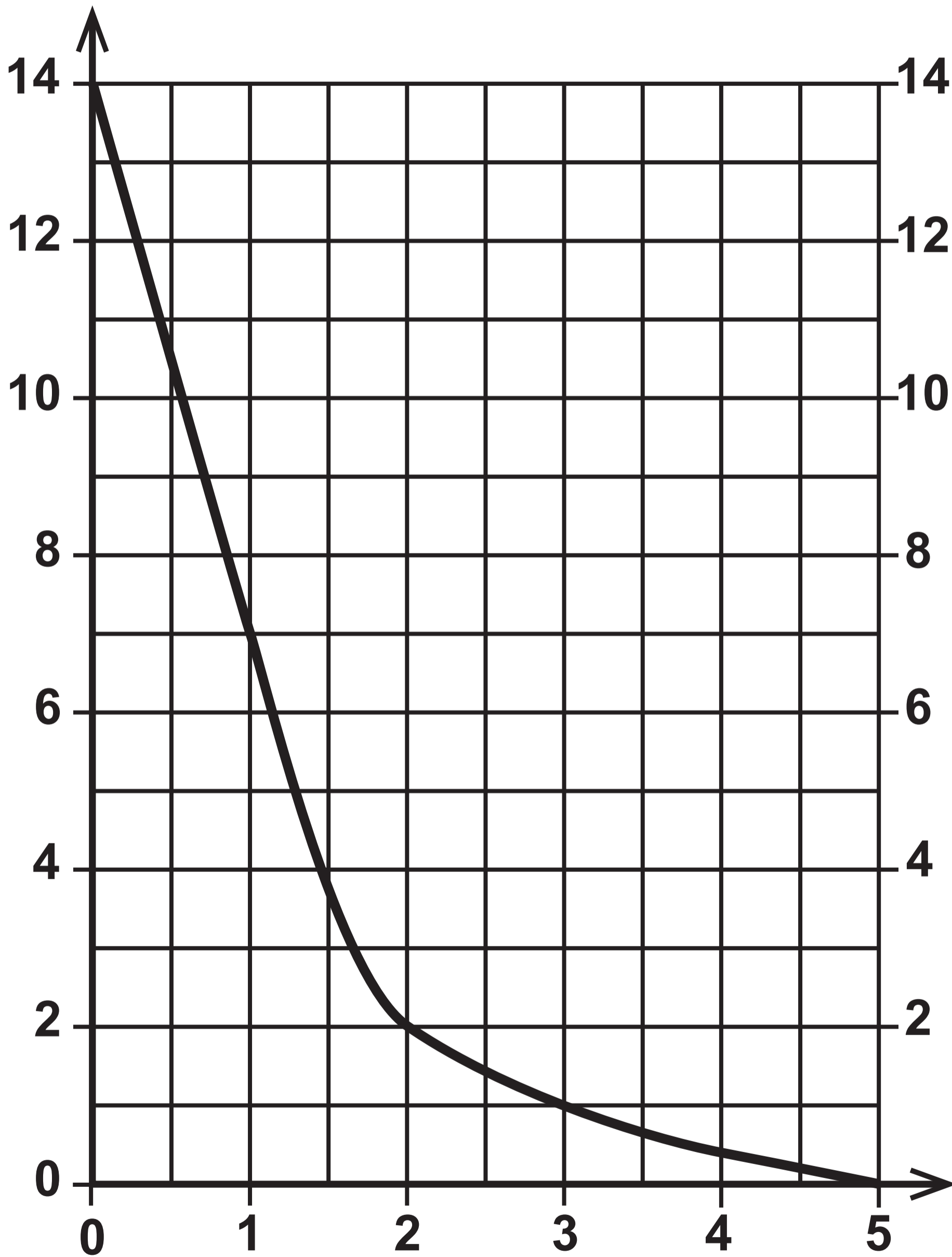
Diagram NOT drawn to scale

FRONT VIEW



Question 11

Velocity (m/s)



Time (seconds)

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MATHEMATICS – NUMERACY**

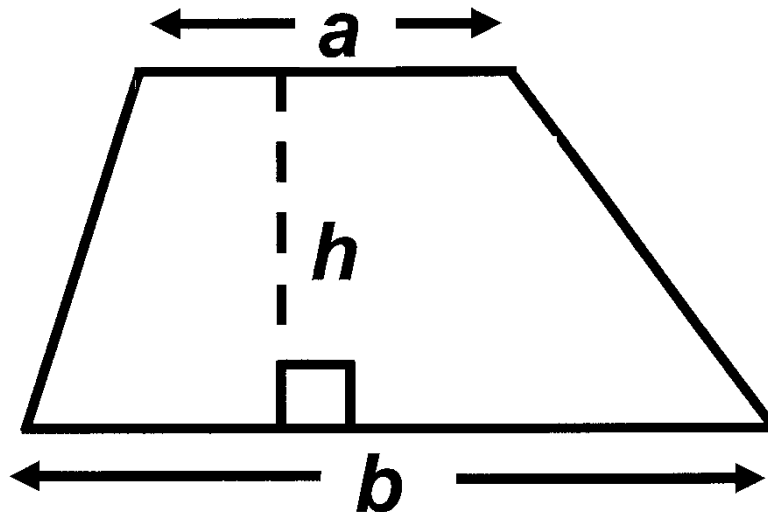
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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 \times length

