



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, protractor and 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 this 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 RUFYAA (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).

Calculate:

- the maximum number of Maldivian rufiyaa (MVR) that Gerallt can buy
- how much this will cost him.

You must show all your working.

(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:

continued on the next page . . .

Question 2 continued

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

Possible groups for answer:

[2 marks]

[6 marks]

(Turn over)

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.

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 $164\,000 \text{ cm}^3$

continued on the next page . . .

Depth of fire surround is _____ cm

[5 marks]

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.

Delia paid £ _____

[2 marks]

continued on the next page . . .

(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.

- (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]

- (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 . . .

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.

[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 _____ %”

You must show all your working.

(Turn over)

[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

[3 marks]

continued on the next page . . .

(Turn over)

Question 8 (a) continued

8. (a) (ii) The average height of a 16-year-old girl in the UK is 162.5 cm.

Calculate an estimate of the percentage of 16-year-old girls in the athletics club who are taller than 162.5 cm.

You must show all your working.

[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.

[2 marks]

(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.

- (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°**

Calculate the length of metal wire needed for the main part of the hanger.

Give your answer in terms of π in its simplest form.

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.

Describe clearly how you use the numbers to select the sample.

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.

The total surface area of the larger hanger is 1.44 times the total surface area of the smaller hanger.

The height of the smaller hanger is **9 cm**.
Calculate the height of the larger hanger.

[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.

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 . . .

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.

In the diagram:

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

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

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

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

continued on the next page . . .

(Turn over)

[4 marks]

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.**

(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: _____

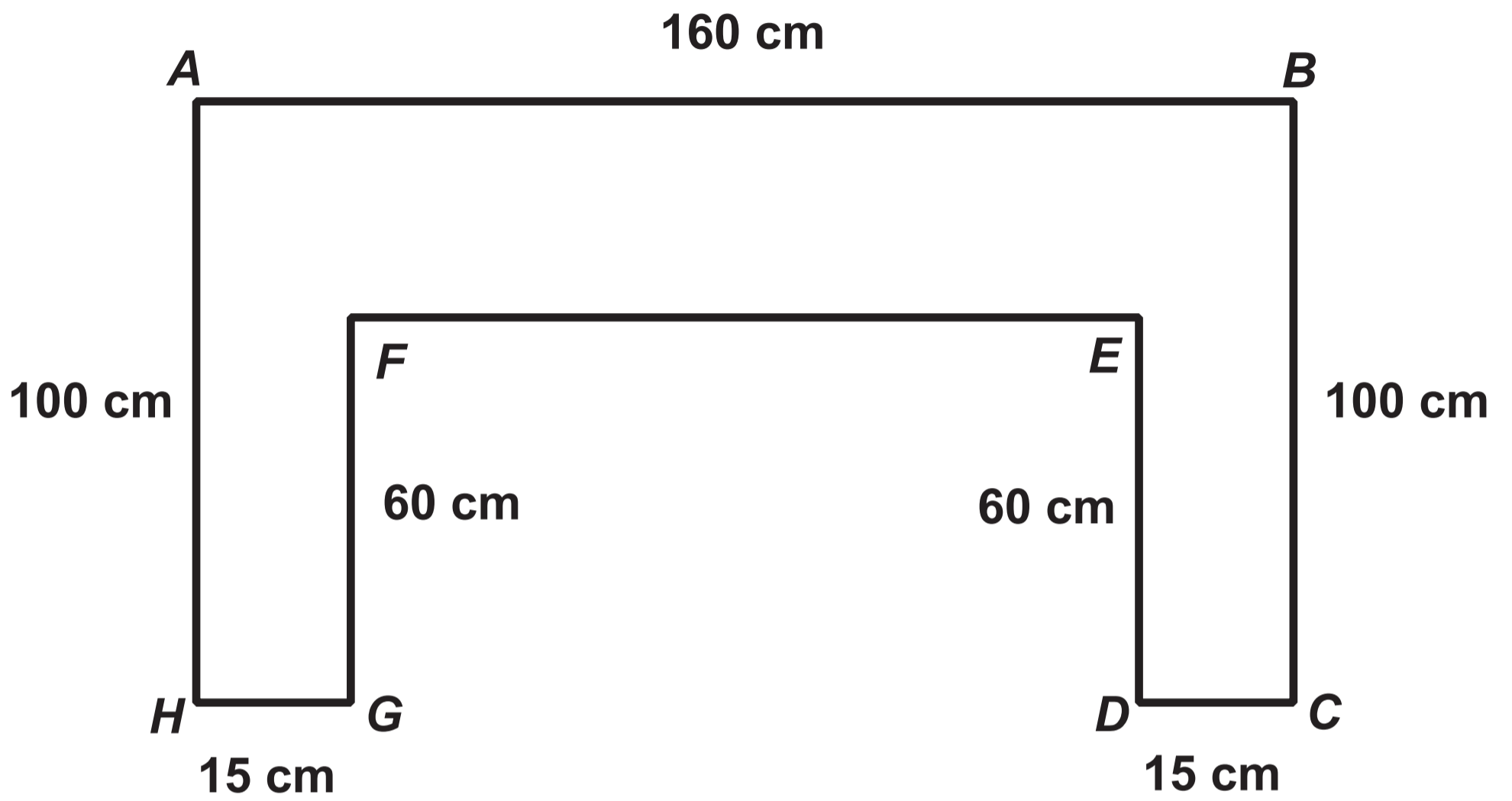
Candidate Number: 0 _____

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

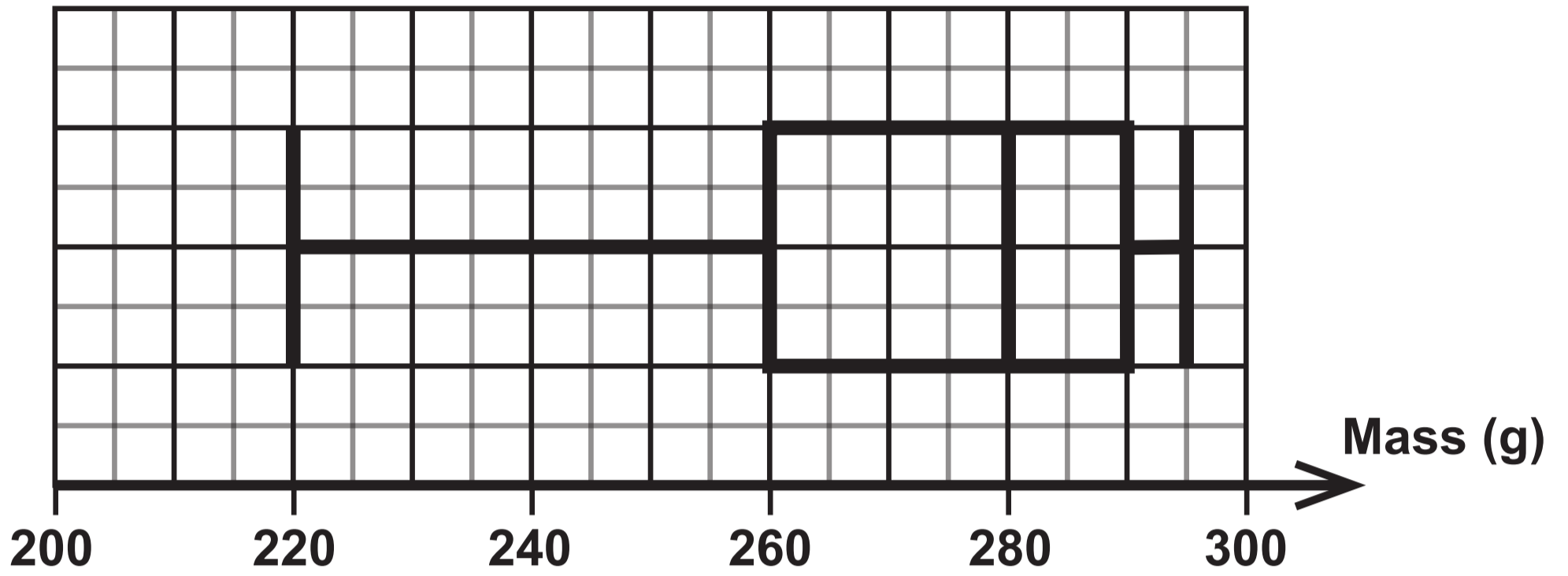


Diagram 2

Little gulls

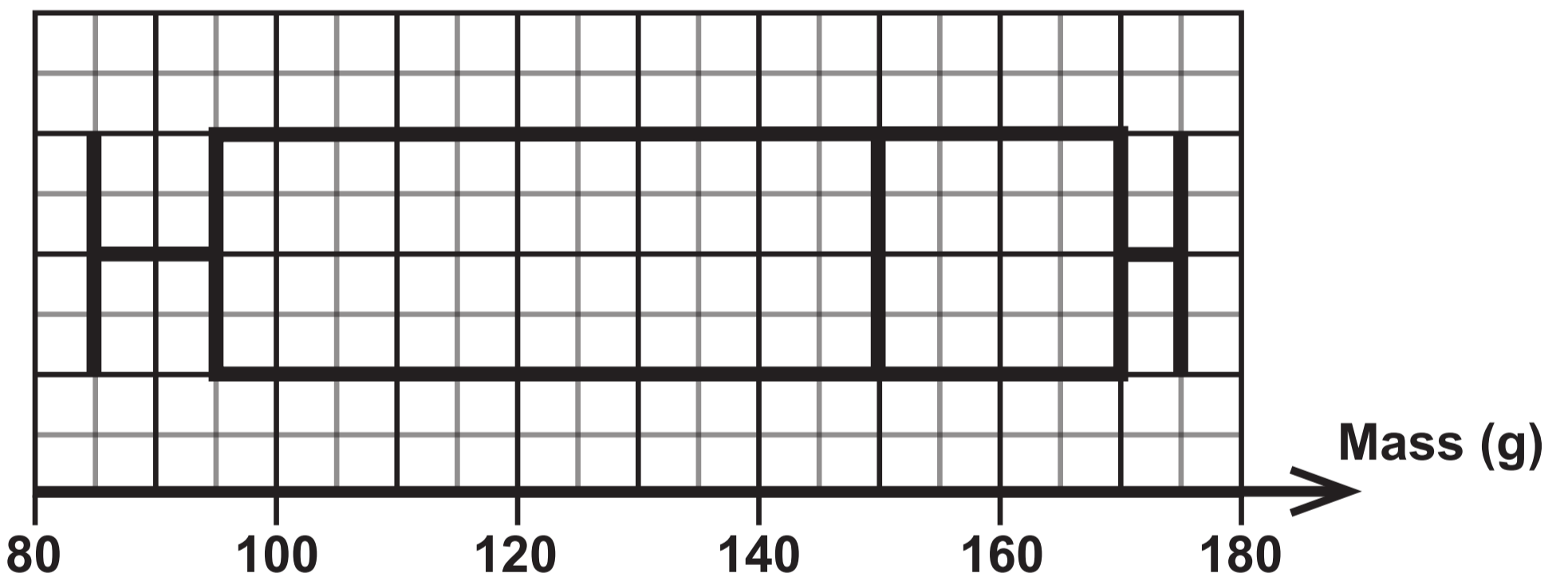
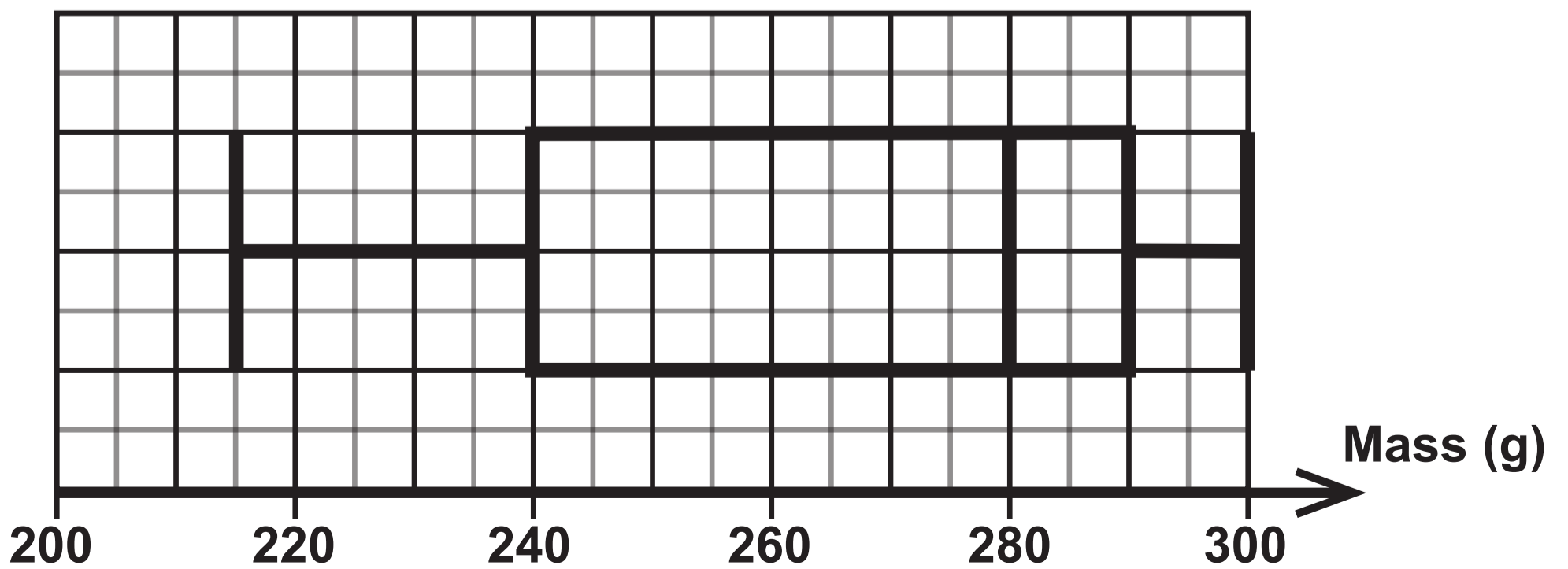



Diagram 3

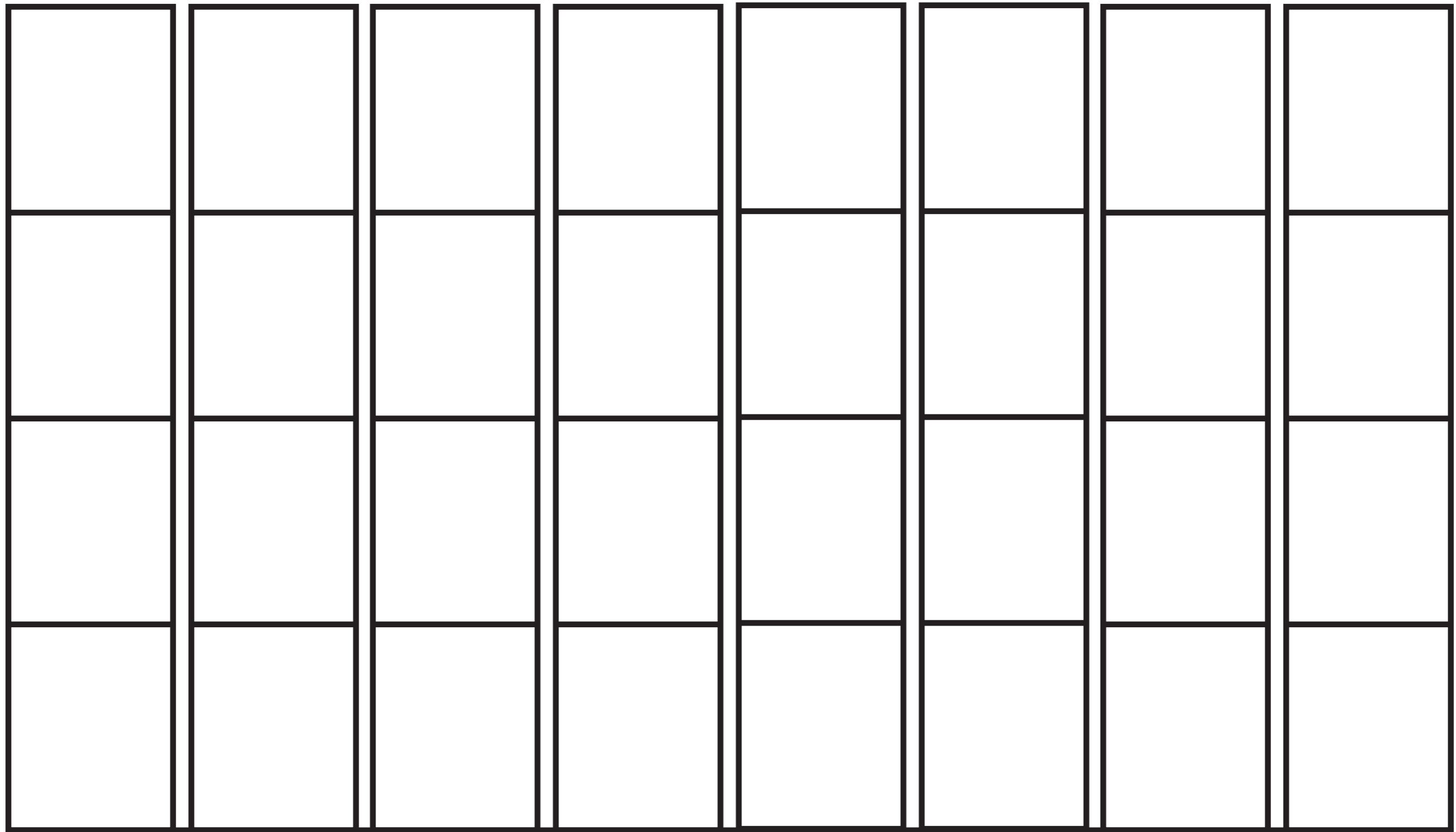
Black – headed gulls



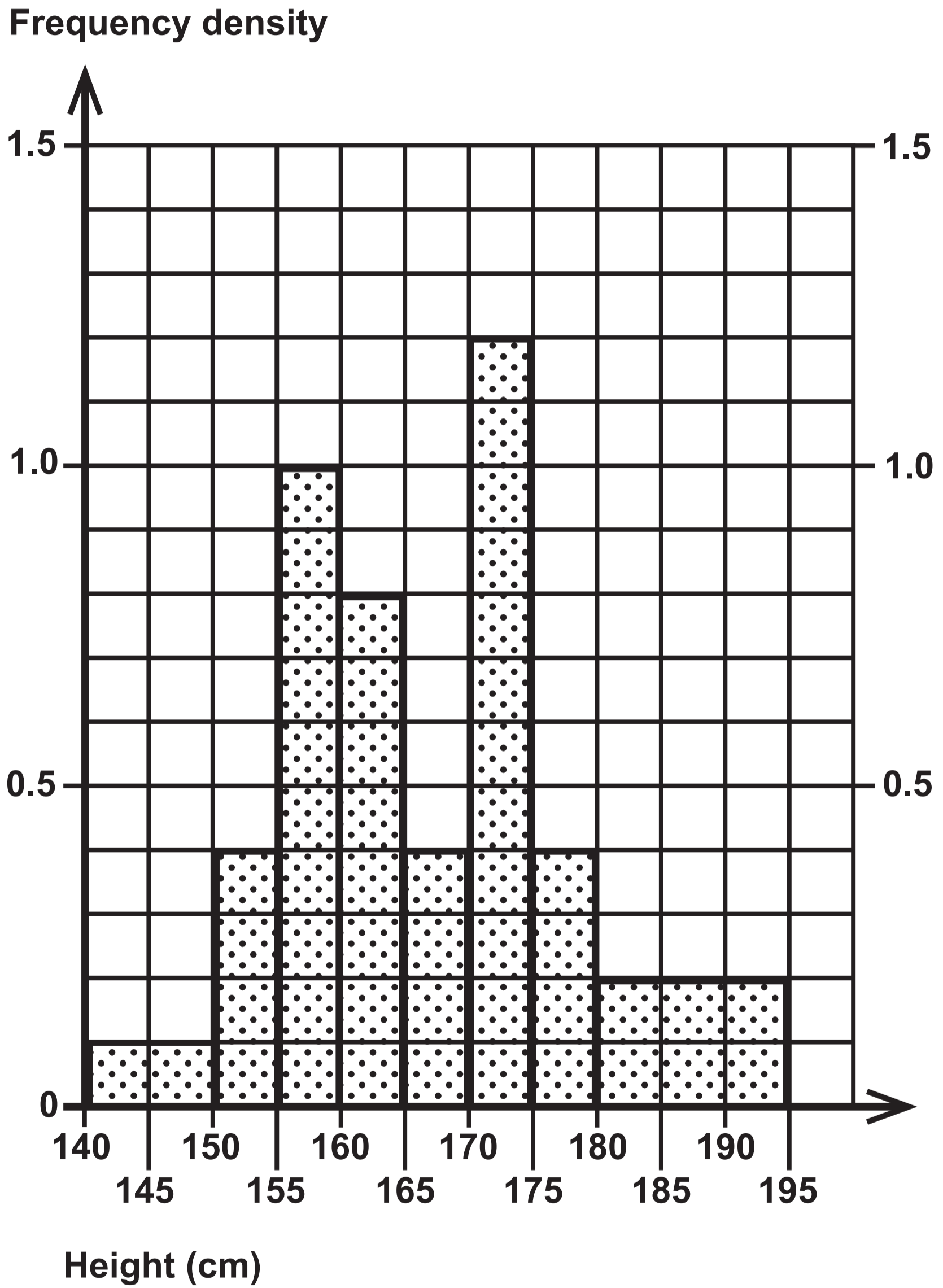
Question 7 (b)

Diagram NOT drawn to scale

Key:  = Container



Question 8

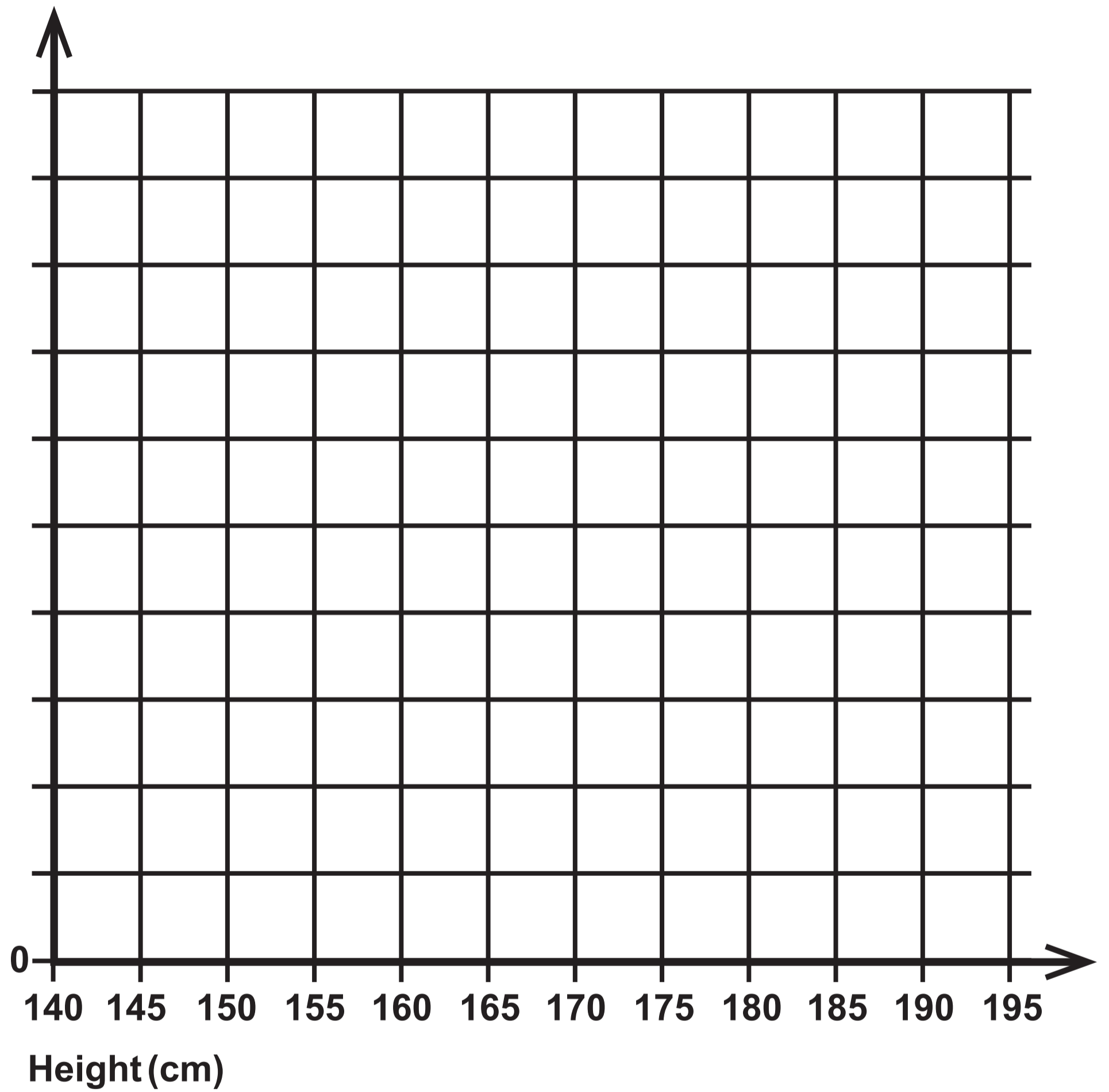


Question 8 (b)

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

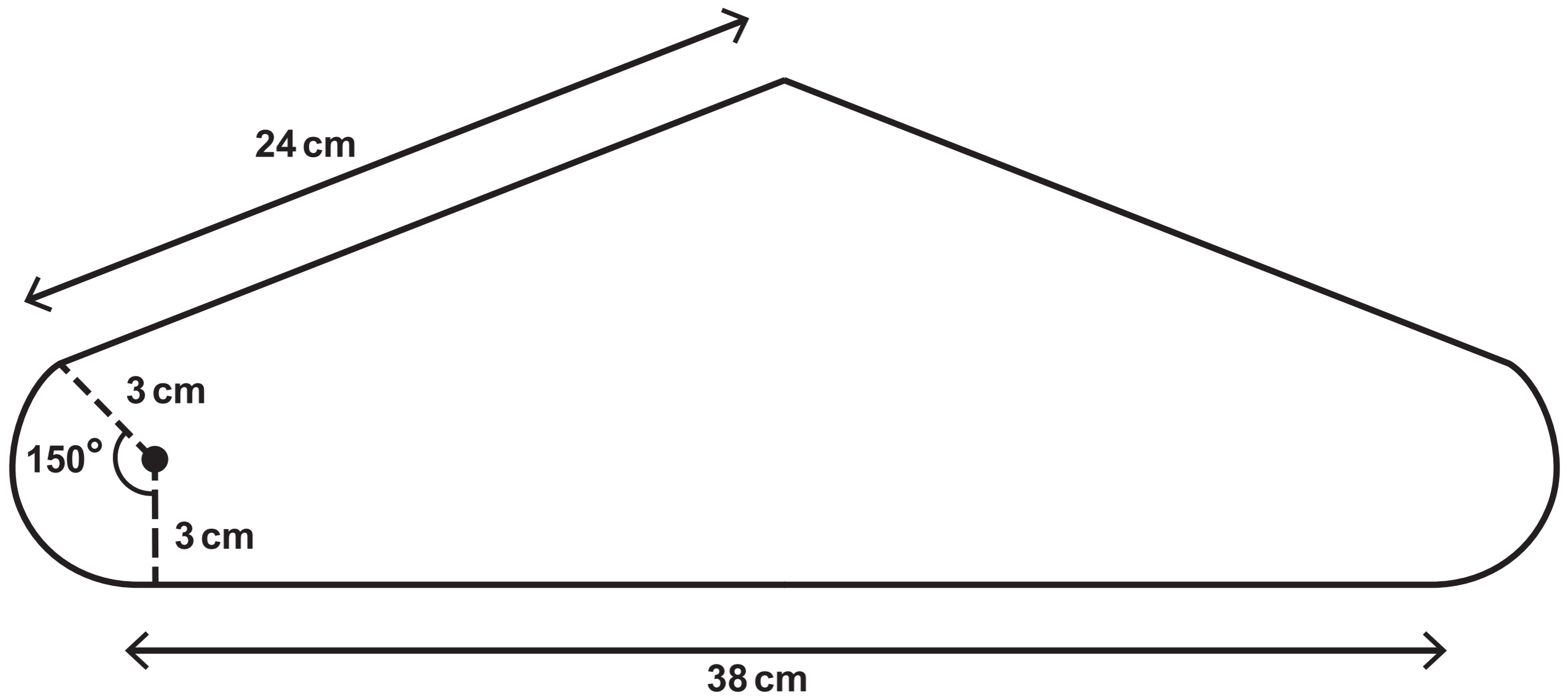
Question 8 (b) (ii)

Frequency density



Question 9

Diagram NOT drawn to scale



Question 9 (b)

299986

890791

810130

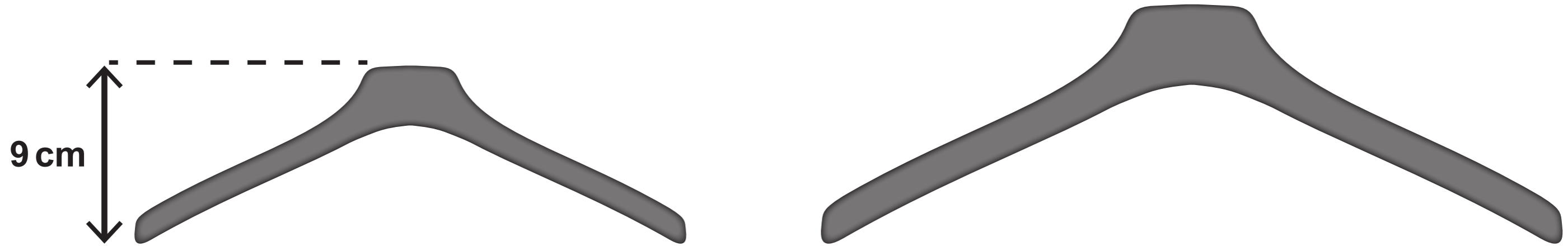
955579

268884

301244

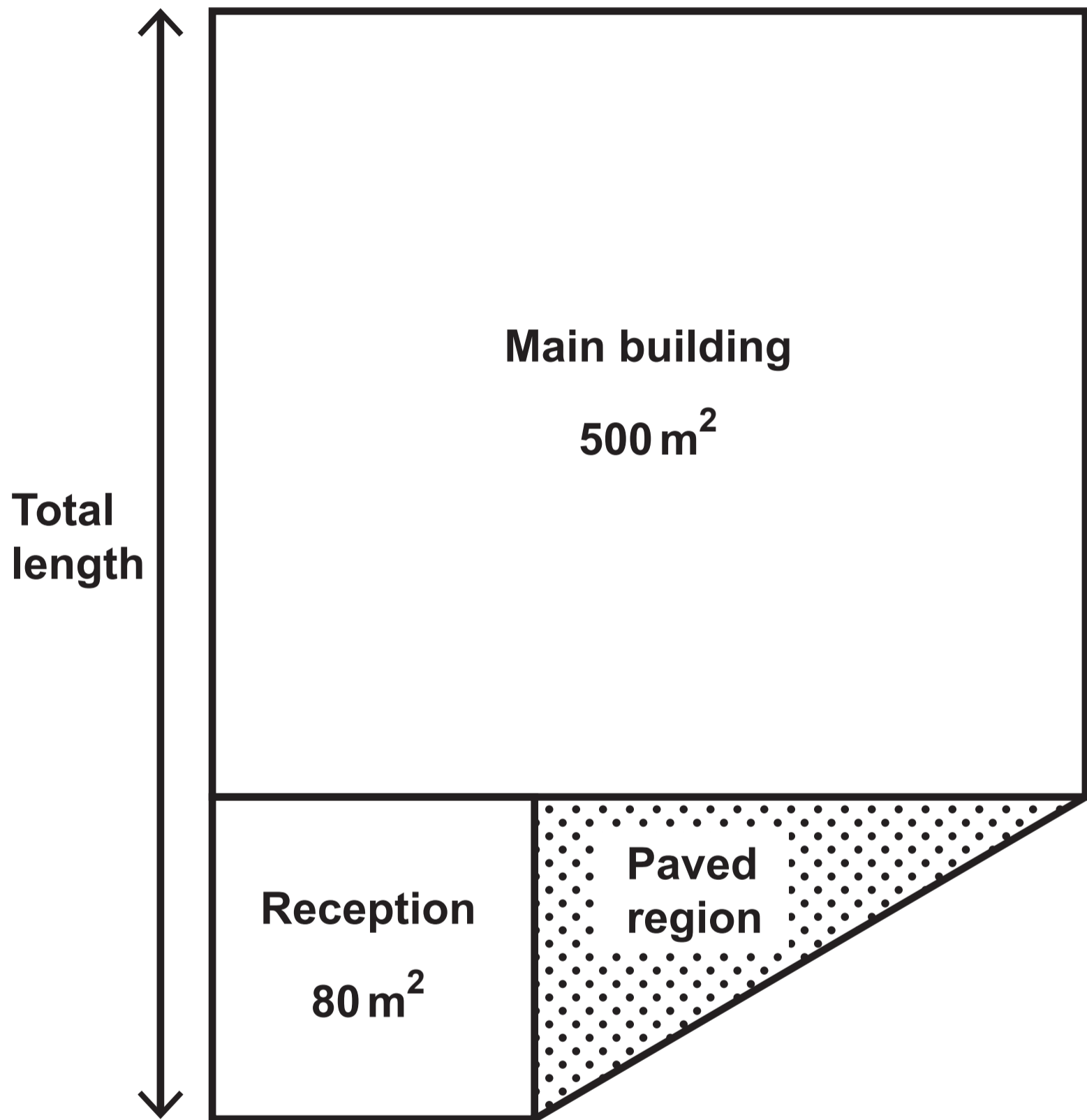
Question 9 (c)

Diagram NOT drawn to scale



Question 10 (a)

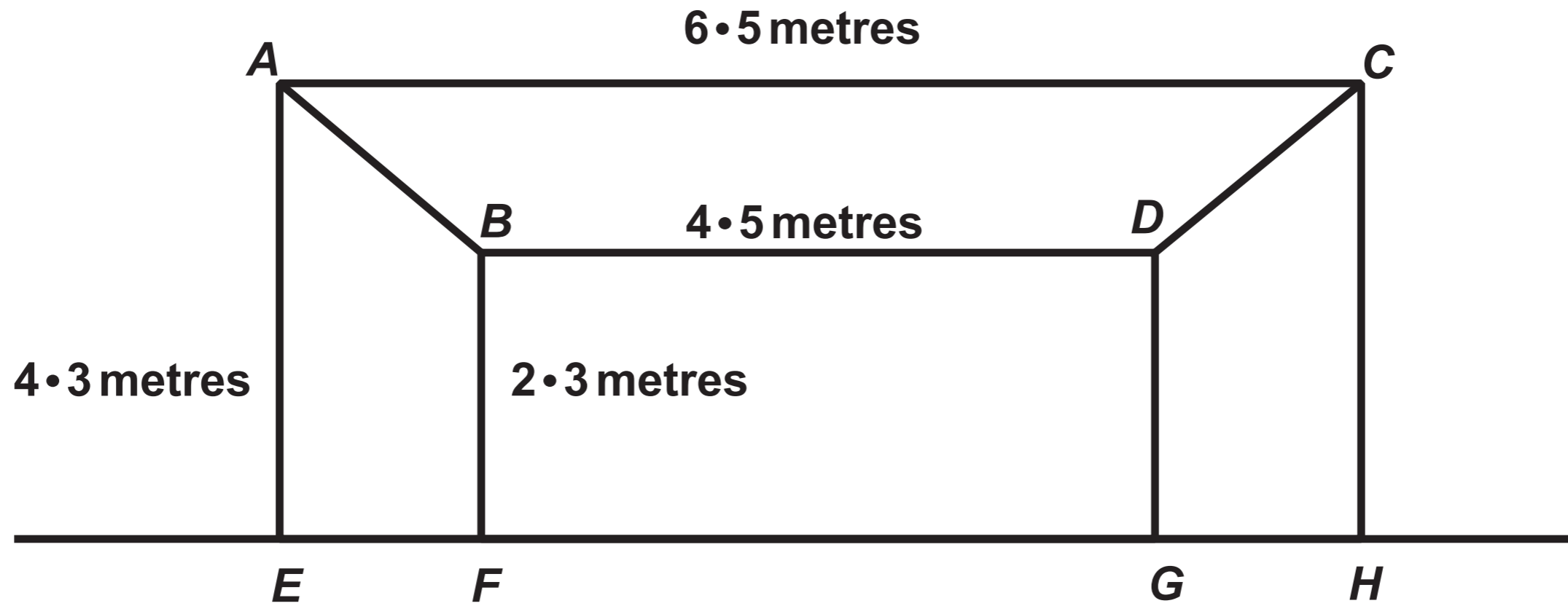
Diagram NOT drawn to scale



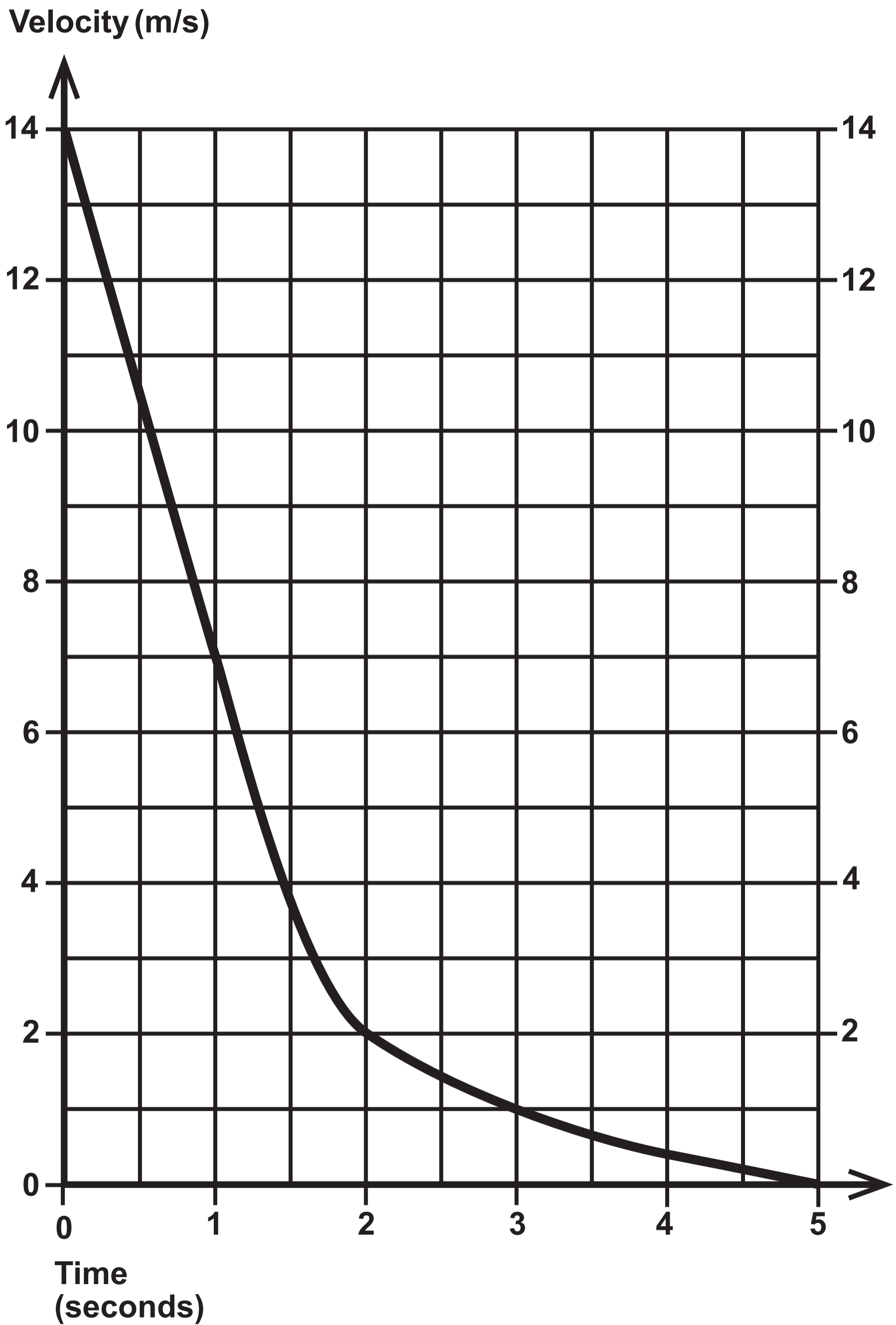
Question 10 (b)

Diagram NOT drawn to scale

FRONT VIEW



Question 11



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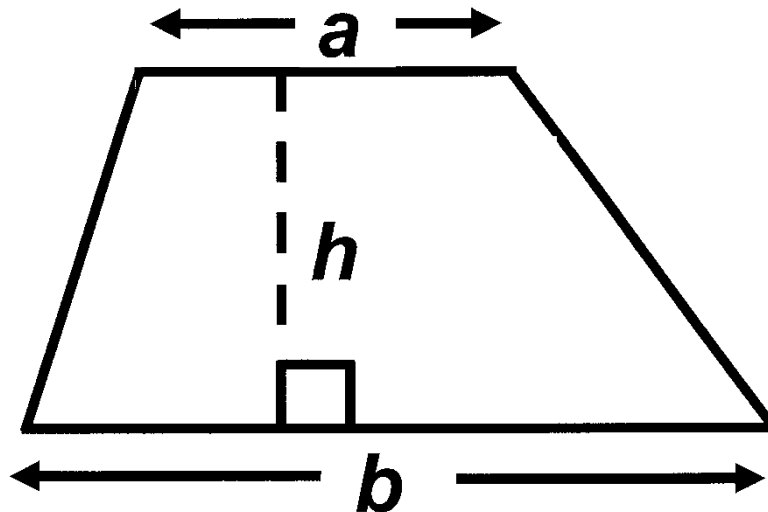
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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

