GCSE

3310U30-1

FRIDAY, 20 MAY 2022 – MORNING

MATHEMATICS – NUMERACY

UNIT 1: NON – CALCULATOR

INTERMEDIATE TIER

1 hour 35 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.	4	
2.	5	
3.	3	
4.	6	
5.	8	
6.	3	
7.	8	
8.	6	
9.	5	
10.	2	
11.	6	
12.	4	
13.	10	
Total	70	

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 $3 \cdot 14$

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

1. Look at the information provided for Question 1 in the separate Diagram Booklet.

(a) Dewi parks his car in Castell Car Park.

He parks for 2 hours 30 minutes.

How much should Dewi pay?

Circle your answer.

£3.60	**£3.40**	**£3.20**	**£3.80**	**£6.00**

[1 mark]

continued on the next page . . .

Question 1 continued

1. (b) Elin paid £5.80 to park her car in Castell Car Park.

What is the maximum length of time that Elin has paid for?

Give your answer in hours and minutes.

You must show all your working.

_____

_____

_____

Maximum length of time is

_____ hours _____ minutes

[3 marks]

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

During the first 10 days of April, the mean daily rainfall in Gwentre was 1·8 cm. On 11th April, the rainfall in Gwentre was 4 cm.

By finding the total rainfall for the first 10 days of April, calculate the mean daily rainfall for the first 11 days of April. You must show all your working.

[3 marks + 2 marks OCW]

3. Apples cost £3 per kg.

Elsa buys some apples weighing a total of 200 g.

She pays with a £10 note.

Calculate how much change Elsa should get.

You must show all your working.

[3 marks]

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

The diagram shows a frequency diagram.

Rodney records how much energy, in calories, different energy bars provide.

Each energy bar has a mass of 35 g.

Rodney draws this frequency diagram to display his findings.

He uses groups of width 10 calories:

100 ≤ energy < 110,

110 ≤ energy < 120,

…… ,

140 ≤ energy < 150,

(a) Which is the modal group?

_____

_____

[1 mark]

continued on the next page . . .

Question 4 continued

4. (b) What fraction of the energy bars provide less than 130 calories?

_____

_____

_____

_____

_____

[3 marks]

continued on the next page . . .

Question 4 continued

4. (c) Consider ONLY the energy bars providing 130 calories or more.

What percentage of these energy bars provide 140 calories or more?

_____

_____

_____

_____

_____

[2 marks]

5. Evans Grocery sells bags of frozen peas.

Cost of small bag (400 g) = 80p
Cost of large bag (1000 g) = £1.80

(a) Look at the diagram for Question 5 (a) in the separate Diagram Booklet.
The diagram is a pie chart.

The pie chart shows information about the number of bags of frozen peas that were sold last month.

A total of 720 bags of frozen peas were sold last month.
Calculate the total cost of the sales of the frozen peas.

[6 marks]

continued on the next page . . .

Question 5 continued

5. (b) Which of the two sizes of bags of peas offers the better value for money?

You must show all your working.

[2 marks]

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

The diagram is NOT drawn to scale.

The diagram shows a plan.

Waintram Housing has a plan for building some new houses.

The plan shows the layout of the drains for some of the houses.

Some of the angles still need to be found.

Find the size of each of the angles *w*, *x* and *y*.

_____

_____

w = _____ °

x = _____ °

y = _____ °

[3 marks]

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

Myra recorded the wingspan and mass of a number of birds.
Her results are shown in the scatter diagram.

(a) The wingspan of one of the birds shown in the scatter diagram is 30 cm.
What is the mass of this bird?

Mass is _____ g

[1 mark]

continued on the next page . . .

Question 7 continued

7. (b) Two of the birds shown in the scatter diagram have a mass of 5 g. What is the difference between the wingspans of these two birds?

_____

_____

Difference between the wingspans is

_____ **cm**

[2 marks]

continued on the next page . . .

Question 7 continued

7. (c) Use $30\text{ cm} \approx 12$ inches to answer this question.

Find the wingspan of the bird with a mass of $8{\cdot}5\text{ g}$.

Give your answer in INCHES.

_____

_____

_____

_____

_____

_____

Wingspan is _____ INCHES

[3 marks]

continued on the next page . . .

Question 7 continued

7. (d) What type of correlation does this scatter diagram show?

_____

_____

[1 mark]

(e) Use the scatter diagram to estimate the wingspan of a bird with a mass of 12 g.

Wingspan is _____ cm

[1 mark]

8. People travel by bus or by train from Hiraddug Station.

On Tuesday, 420 people travelled by bus from the station.

(a) Of the 420 people who travelled by bus from the station, 35% had a travel pass. Calculate the number of people who travelled by bus and did NOT have a travel pass.

[3 marks]

continued on the next page . . .

Question 8 continued

8. (b) On Tuesday, the ratio of the number of people travelling by bus to the number of people travelling by train was 20 : 17

Calculate the number of people who travelled by train from the station on Tuesday.

[3 marks]

9. (a) Gwyn is making some packs.

Each pack contains one nut, one bolt and one washer.

To make up these packs, Gwyn buys:

- **some boxes that contain 30 nuts each**
- **some boxes that contain 5 bolts each**
- **some boxes that contain 25 washers each.**

Gwyn wants to buy the LEAST POSSIBLE NUMBER OF BOXES so that, in making up the packs, he uses ALL of the nuts, bolts and washers he has bought.

continued on the next page . . .

Question 9 (a) continued

Complete the table provided for Question 9 (a) in the separate Diagram Booklet to show the number of boxes of each item that Gwyn needs to buy.

You must show all your working.

[3 marks]

continued on the next page . . .

Question 9 continued

9. (b) Each washer has a thickness of 2 mm, correct to the nearest 0•5 mm.

Calculate the greatest possible thickness of a stack of 6 washers.

[2 marks]

10. The surface area of the Earth is

510 million km^2

Write this area in standard form.

_____

_____

_____

_____

_____

_____ **km^2**

[2 marks]

11. OrenVit is a company that produces bottles of orange juice.

The company uses only bottles with a capacity of one litre.

Each day, the cost of producing bottles of orange juice is as follows:

Fixed charge for use of equipment	**£10**
Cost of ingredients	**80p per bottle**
Cost of empty bottles with labels	**20p per bottle**

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

On the graph paper, draw a graph to show the total daily cost of producing between 0 and 100 bottles of orange juice.

_____

_____

_____

[3 marks]

continued on the next page . . .

Question 11 continued

11. (b) One day, OrenVit produces 1750 PINTS of orange juice in one – litre bottles. Calculate the cost of producing this quantity of orange juice.

[3 marks]

12. Rectangular stickers with warnings written on them are often placed near water taps.

Look at Diagram 1 and Diagram 2 for Question 12 in the separate Diagram Booklet.
The diagrams are NOT drawn to scale.

The rectangular sticker shown in Diagram 1 warns of hot water.
It has a length of 14 cm and an area of 42 cm^2

Diagram 2 is mathematically similar to the first sticker.
It is an enlargement of the first sticker, with scale factor 4

Calculate the length and the width of the larger sticker (Diagram 2).
You must show all your working.

[4 marks]

13. (a) Look at the diagram for Question 13 (a) in the separate Diagram Booklet.
The diagram is a cumulative frequency graph.

An aquarium has 35 ray fish.
The cumulative frequency graph shows information about the lengths of these ray fish.

Use the cumulative frequency diagram to give the best estimates for the answers to the following questions.

(i) What is the median length of these ray fish?

_____

_____

_____ **cm**

[1 mark]

continued on the next page . . .

Question 13 (a) continued

13. (a) (ii) How many of these ray fish have lengths greater than 72 cm?

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 13 continued

13. (b) The aquarium also has guppies.

The table below shows information about the length of the guppies in a sample of 60 guppies.

Minimum	**1·5 cm**
Range	**5·0 cm**
Median	**3·0 cm**
Lower quartile	**2·5 cm**
Interquartile range	**3·5 cm**

(i) On the grid provided for Question 13 (b) (i) in the separate Diagram Booklet, draw a box – and – whisker plot of this data.

[4 marks]

Question 13 (b) continued

13. (b) (ii) How many of the sample of 60 guppies have a length greater than or equal to 2·5 cm?

_____

_____

_____

_____

_____

[2 marks]

continued on the next page . . .

Question 13 continued

13. (c) A carp was weighed in November 2021.

It was weighed again in April 2022.

The carp had a mass of 9·9 kg in April 2022.

Between these dates, the mass of the carp increased by 10%

Calculate the mass of the carp in November 2021.

[2 marks]

END OF PAPER

TOTAL 70 MARKS

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

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INTERMEDIATE TIER

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Diagram Booklet

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

Question 1

CASTELL CAR PARK

PARKING CHARGES

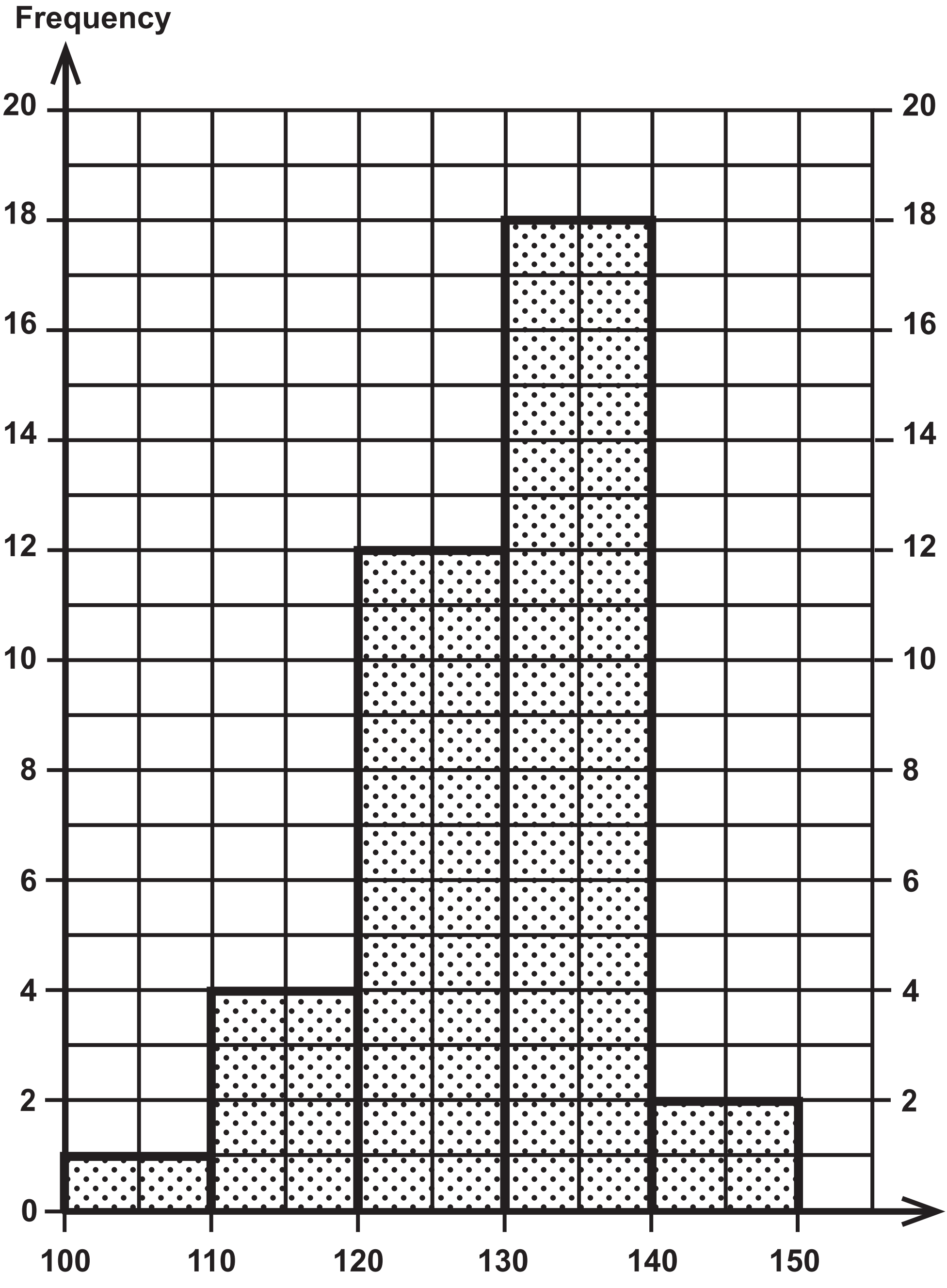
£3 for the first 2 HOURS, or part of the first 2 hours

AND after that

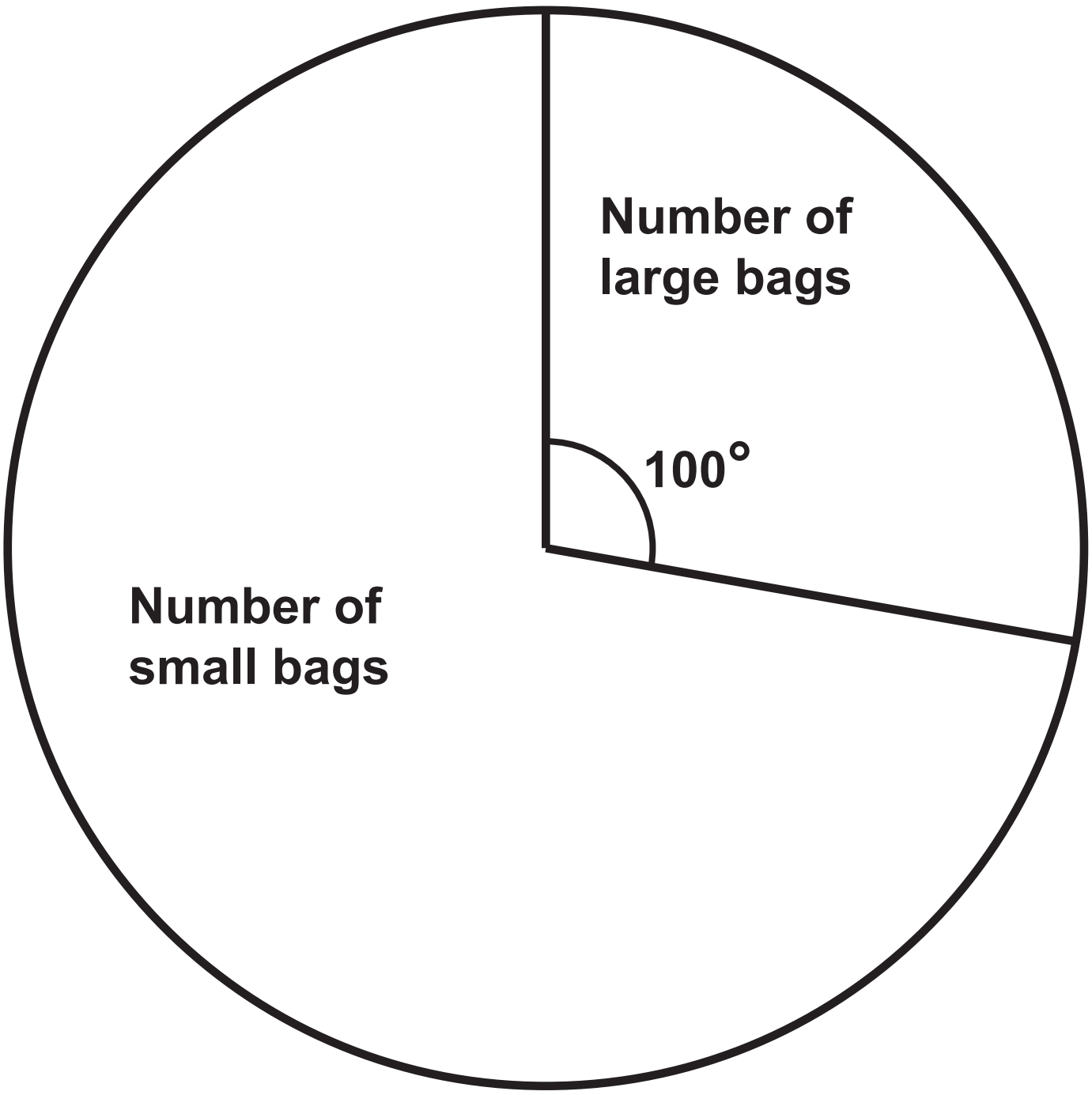
40p for every further 20 MINUTES, or part of each 20 minutes

Maximum stay is 24 hours

Question 4

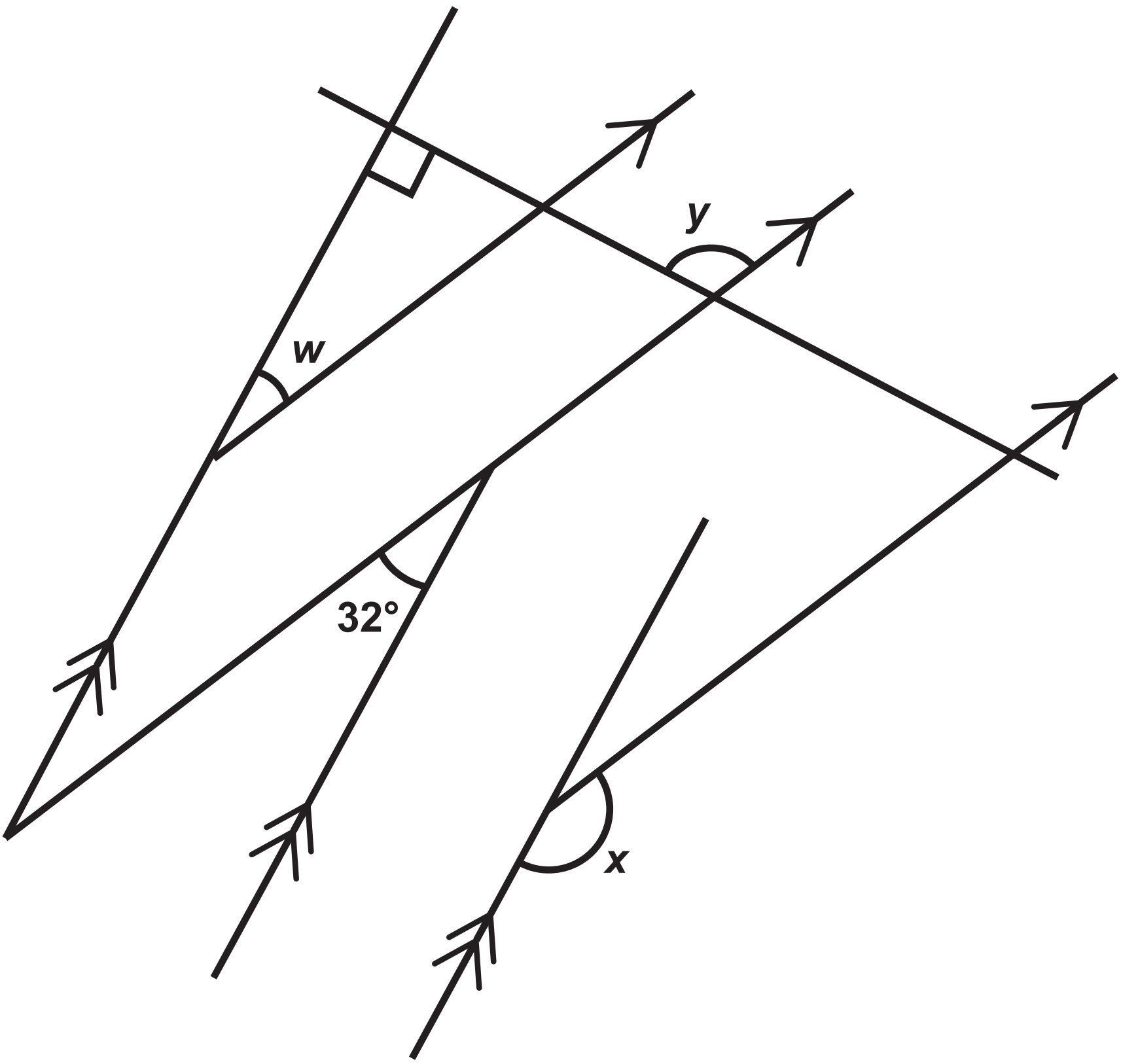

Frequency
20
18
16
14
12
10
8
6
4
2
0
100
110
120
130
140
150
Energy (calories)

Question 5 (a)

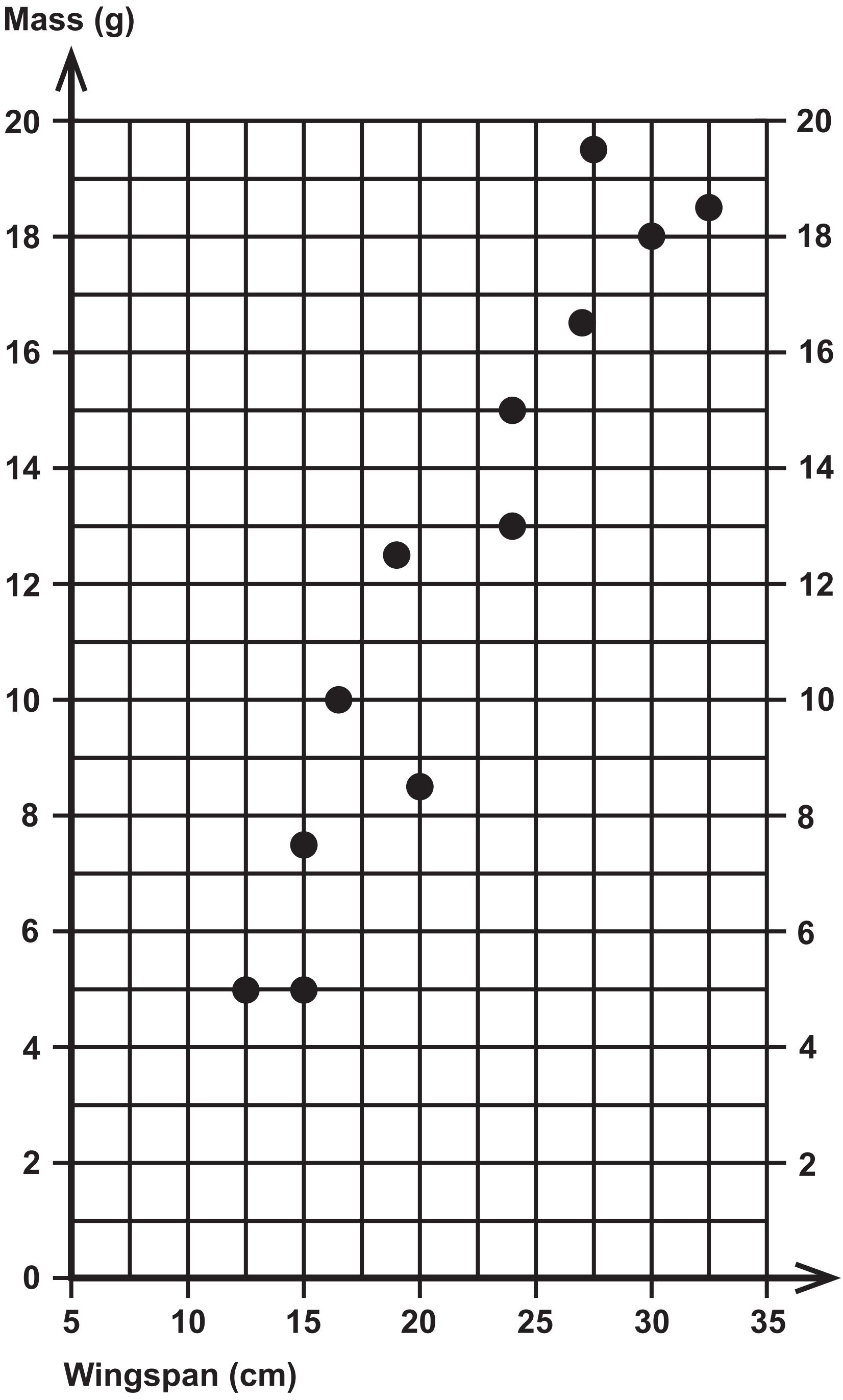


Question 6

Diagram NOT drawn to scale



Question 7

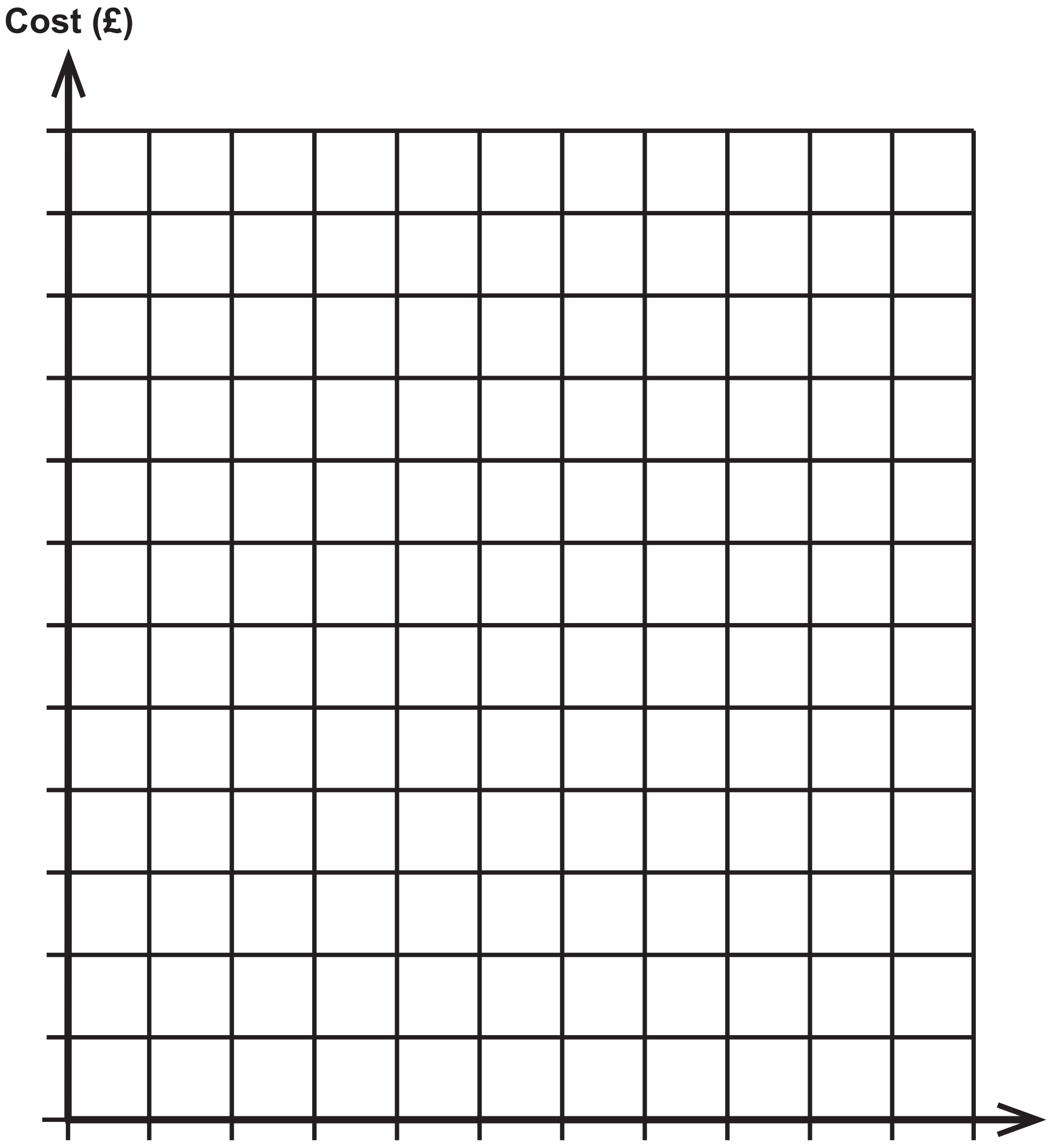


Question 9 (a)

Table

	Number of boxes needed
Nuts (30 in each box)	_____ boxes
Bolts (5 in each box)	_____ boxes
Washers (25 in each box)	_____ boxes

Question 11 (a)



Question 12

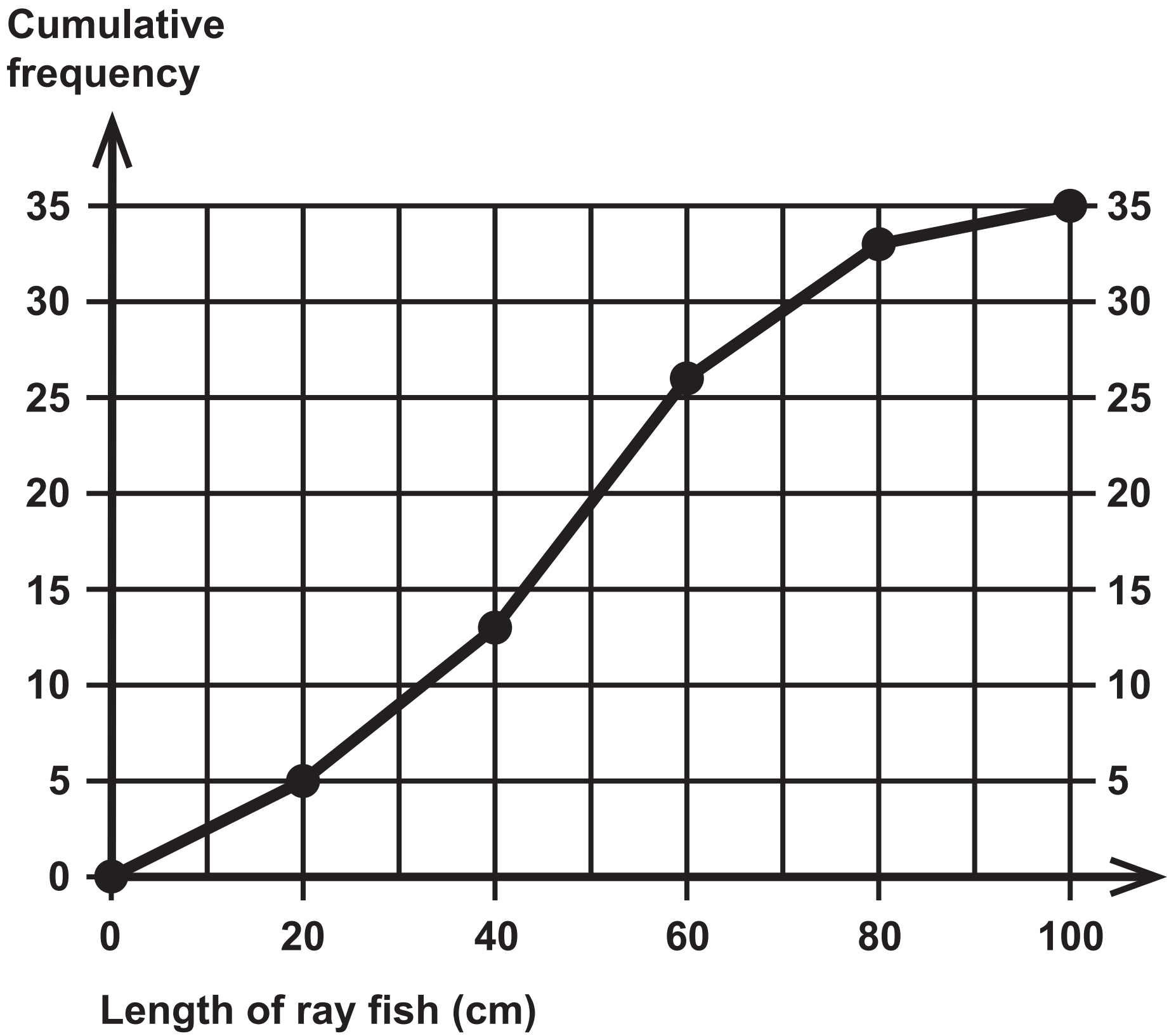
Diagram 1

Diagram NOT drawn to scale

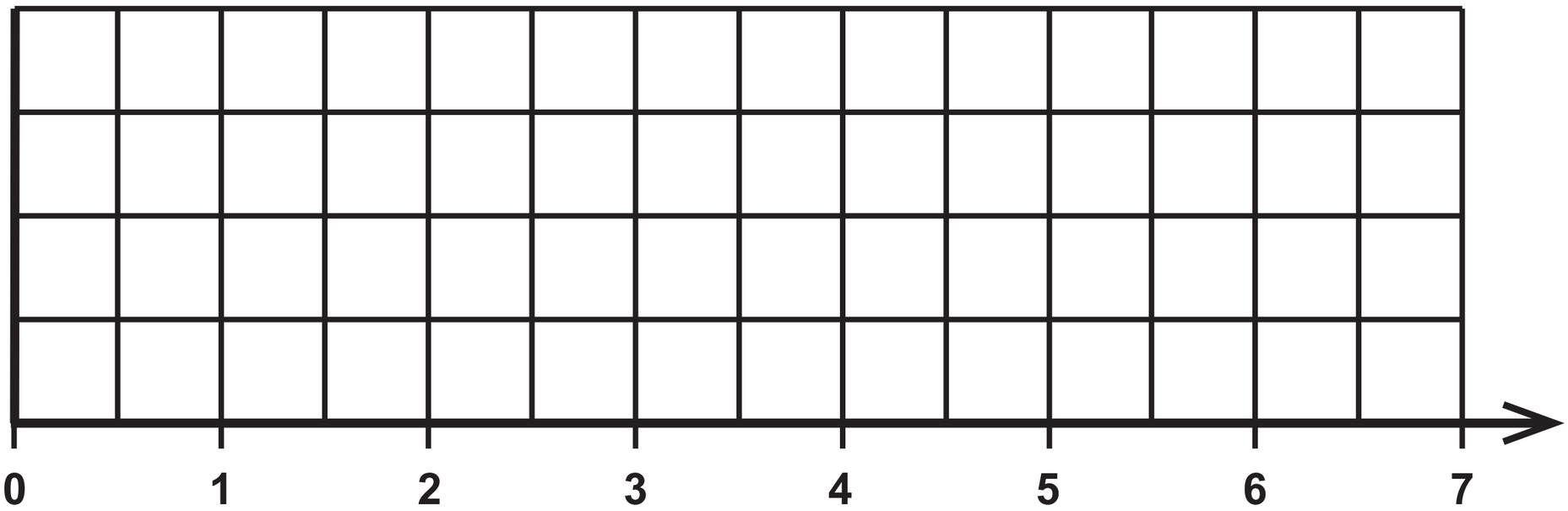
Diagram 2

Diagram NOT drawn to scale

Question 13 (a)



Question 13 (b) (i)



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MATHEMATICS
and
NUMERACY

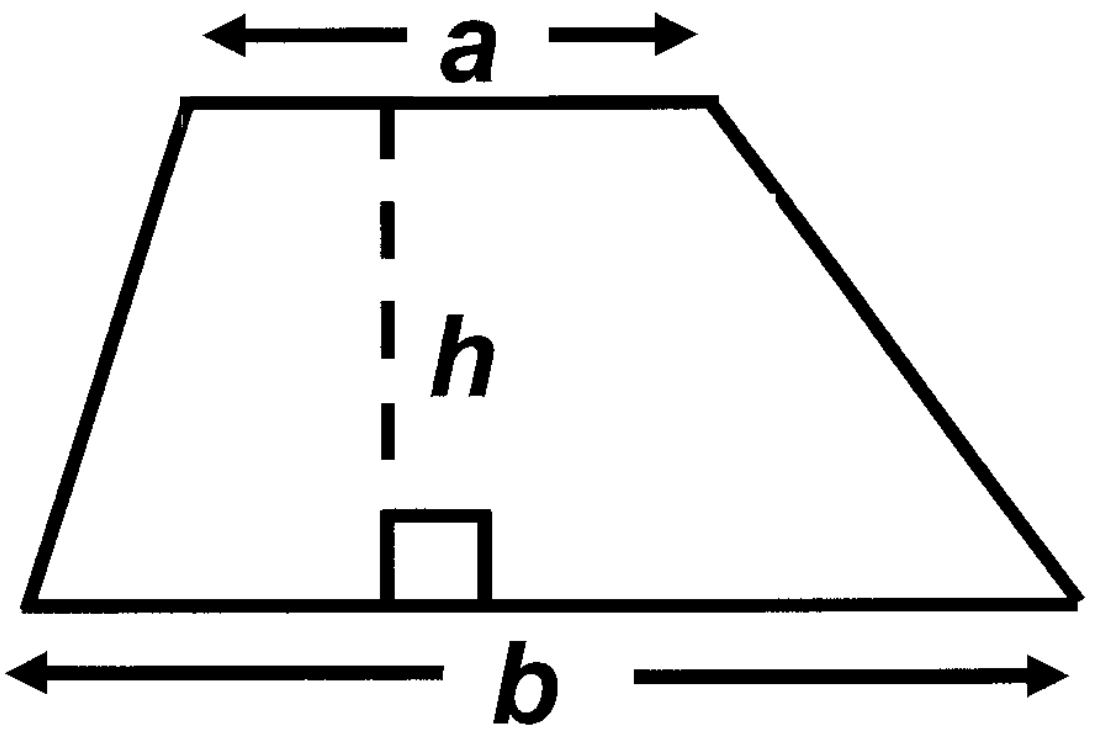
FORMULA LIST
INTERMEDIATE TIER
GCSE

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