GCSE

3310U20-1

MATHEMATICS – NUMERACY

UNIT 2:

CALCULATOR – ALLOWED

FOUNDATION TIER

THURSDAY,

7 NOVEMBER 2019

– MORNING

1 hour 30 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.	8	
2.	12	
3.	7	
4.	6	
5.	3	
6.	5	
7.	4	
8.	5	
9.	4	
10.	5	
11.	6	
Total	65	

Surname:	
First name(s):	
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.

Model for Question 2 (d).

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

Take π as $3 \cdot 14$ 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 (b), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

1. Mrs Jones is a mathematics teacher.
She orders some equipment for her department.

She sees the items below in a catalogue from a stationery company.

PROTRACTORS BOX OF 50	£3.45
RULERS BOX OF 50	£4.99
PAIR OF COMPASSES BOX OF 25	£24.59
SCIENTIFIC CALCULATOR	£12.99 EACH

continued on the next page . . .

Question 1 continued

1. (a) Mrs Jones buys the items listed below.

Complete the following table to show her bill for these items.

ITEM	COST
1 box of protractors	£3.45
4 boxes of rulers	£
3 boxes of compasses	£
30 scientific calculators	£
TOTAL	£

[4 marks]

continued on the next page . . .

Question 1 continued

1. (b) The company offers Mrs Jones a discount of 25% off the total cost of these items. How much discount does she receive?

[2 marks]

continued on the next page . . .

Question 1 continued

1. (c) After paying for the items,

Mrs Jones has £164 left to spend on equipment for the department.

She wants to spend the remaining money on buying as many scientific calculators as possible.

There will be no discount on this order.

How many extra calculators can Mrs Jones buy?

Mrs Jones can buy _____ extra calculators.

[2 marks]

2. Look at the formula provided for Question 2 in the separate Diagram Booklet.
A company calculates its postage costs by using the formula shown.

(a) Here is a note showing how many SMALL LETTERS and LARGE LETTERS were posted in a particular week.

Total postage costs = ……..
143 small letters
50 large letters

Calculate the total postage costs for this week.

[3 marks]

continued on the next page . . .

Question 2 continued

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

Here is a note showing the total postage cost and the number of SMALL LETTERS posted the following week.

Total postage cost = £119.47
125 small letters
…… large letters

Find how many LARGE LETTERS were posted that week.
You must show all your working.

[4 marks + 2 marks OCW]

continued on the next page . . .

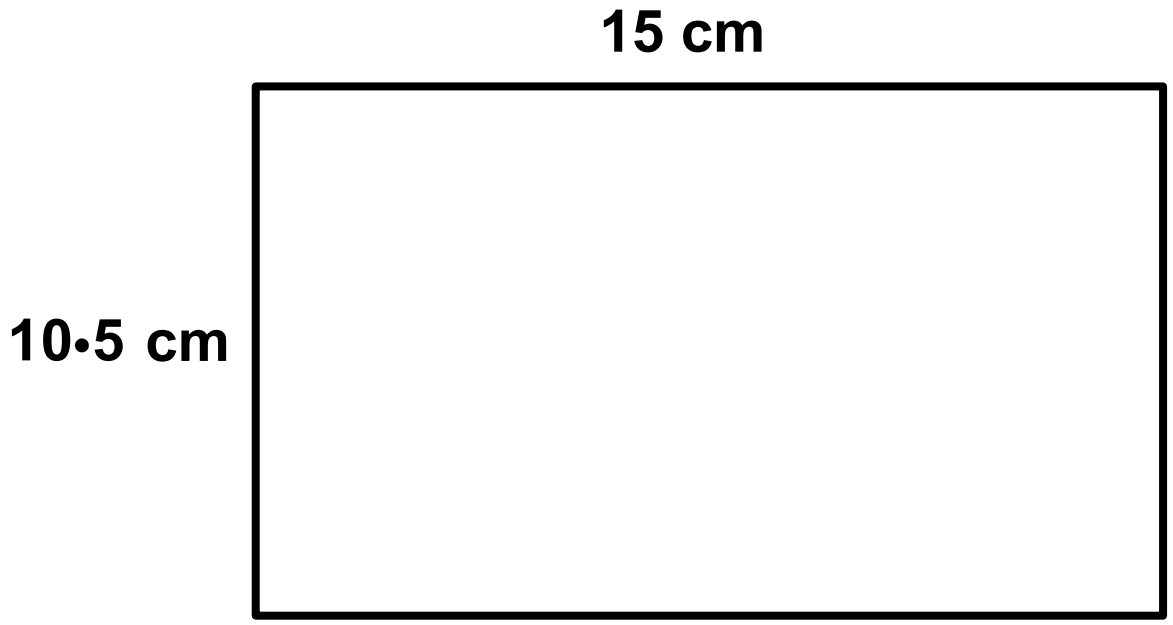
Question 2 continued

2. (c) The company produces some postcards to advertise the business.

The postcards are rectangular.

The dimensions can be seen on the diagram below.

The diagram is NOT drawn to scale.



continued on the next page . . .

Question 2 (c) continued

What is the perimeter of the postcard?

Circle your answer.

50•10 cm	**25•5 cm**	**51 cm**
157•5 cm^2	**157•5 cm**	

[1 mark]

continued on the next page . . .

Question 2 continued

2. (d) Ask for the model for Question 2 (d).

The model is NOT made to scale.

The model is a cuboid.

The postcards are to be stored in boxes shaped like a cuboid.

Look at the diagrams for Question 2 (d) in the separate Diagram Booklet.

The diagrams show Net A, Net B, Net C, Net D and Net E.

Which TWO of the following nets can be used to make the boxes?

Circle your answers.

Net A	Net B	Net C	Net D	Net E

[2 marks]

3. Mair has two dogs, Gelert and Tili.

(a) Gelert weighs 22 lb (pounds).

Tili weighs 14•5 kg.

Including an appropriate calculation, explain fully how you know that Tili is heavier than Gelert.

[2 marks]

continued on the next page . . .

Question 3 continued

3. (b) Both dogs eat a particular brand of dog food.

Look at the diagram for Question 3 (b) in the separate Diagram Booklet.

The diagram is a graph.

The graph shows the amount of food that dogs of different sizes should eat EACH DAY.

Gelert is a medium – sized dog.

Tili is a large dog.

(i) Using the graph, how much food IN TOTAL should Gelert and Tili eat each day?

_____

_____

_____

[2 marks]

continued on the next page . . .

Question 3 (b) continued

3. (b) (ii) Mair buys an 18 kg bag of the dog food.

How many days will the 18 kg bag of food last?

The 18 kg bag of food will last for

_____ days

[3 marks]

4. Evan wears a fitness watch that shows the time and the number of steps he has taken during the day.

Evan goes for a run one evening.
The displays on his watch at the beginning of the run and at the end of the run are shown below.

BEGINNING OF THE RUN

TIME	19:38

STEPS	2656

END OF THE RUN

TIME	20:14

STEPS	10538

continued on the next page . . .

Question 4 continued

4. (a) For how long did Evan run?

Circle your answer.

24 minutes	**22 minutes**	**52 minutes**
36 minutes	**76 minutes**	

[1 mark]

continued on the next page . . .

Question 4 continued

4. (b) Write, in words, the number of steps displayed on Evan's watch at the END of the run.

_____

_____

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 4 continued

4. (c) Evan wants to know how many miles he has run.

The number of steps taken to complete one mile depends upon the runner's height.

Look at the table for Question 4 (c) in the separate Diagram Booklet. The table, taken from the internet, gives this information.

Evan is 5 feet 7 inches tall.

How many miles did Evan run?

[4 marks]

5. **Ceri and Paulo both sit the same mathematics test.**

The test is marked out of 125

Ceri scores 78 marks in the test.

Paulo's result is 64%

Who has the higher result in this mathematics test?
You must show all your working.

[3 marks]

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

Barrels are used to store liquid. Glass containers are filled with liquid from a barrel.

The table gives the capacity of some glass containers and their traditional names.

(a) Complete the table to give the number of bottles equivalent to all the traditional sizes.

[2 marks]

continued on the next page . . .

Question 6 continued

6. (b) A barrel contains just enough liquid to fill 3 Salmanazars and 1 Magnum.

Which of the following amounts does the barrel hold?

Circle your answer.

4 bottles	**28·5 bottles**	**10·5 bottles**
36 bottles	**38 bottles**	

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 6 continued

6. (c) A different barrel contains just enough liquid to fill 30 Magnums.

How many Salmanazars can be filled from this barrel?

[2 marks]

7. Five pupils attended a dance class every Thursday.

For these five pupils:

- **the median of their ages is 17 years,**
- **the mode is 18 years,**
- **the range of their ages is 8 years,**
- **one pupil is 2 years older than the youngest pupil.**

Coleen now joins this class.
She is two years younger than the mean age of the other 5 pupils.

How old is Coleen?
You must show all your working.

[4 marks]

8. (a) $\frac{6}{11}$ of Jenna's friends have pets.

Of these friends with pets, $\frac{2}{3}$ of them have a dog.

Use this information to answer each of the following questions.

(i) Jenna has 33 friends.

How many of her friends have a pet?

[2 marks]

continued on the next page . . .

Question 8 (a) continued

8. (a) (ii) What fraction of Jenna's friends have a dog?

[2 marks]

continued on the next page . . .

Question 8 continued

8. (b) **120 people were surveyed.**

They were each asked which is their favourite pet: dog, cat or fish.

The numbers who answered dog, cat and fish were in the ratio

63 : 39 : 18

Express this ratio in its simplest terms.

[1 mark]

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

A map of north Wales and the border with England is shown.

The distance between Wrexham and Oswestry is approximately 20 km by road.

(a) The straight – line distance between Wrexham and Oswestry on the map is 4 cm.

Which of the following represents the scale of the map?

Circle your answer.

1 : 5	1 : 500	1 : 5000
1 : 50 000	1 : 500 000	

_____

_____

_____

[1 mark]

Question 9 continued

9. (b) Lauren travels by road directly from Wrexham to Oswestry.

This journey takes 25 minutes.

Calculate the average speed for Lauren's journey.

Give your answer in km/h.

Average speed _____ km/h

[3 marks]

10. Look at the diagram for Question 10 in the separate Diagram Booklet.
The diagram is a scatter diagram.

Some students were asked to select an even number between 0 and 100
The heights of these students and the number they each selected are shown in the scatter diagram.

(a) Describe the correlation shown by the scatter diagram.

_____

_____

[1 mark]

continued on the next page . . .

Question 10 continued

10. (b) **Gwenda and Daniel selected the same number.**

Gwenda is shorter than Daniel.

Lotte is the shortest student.

Iona and Steffan are both the same height.

Iona selected a number greater than 40

Complete the table for Question 10 (b) in the separate Diagram Booklet.

[4 marks]

11.

ARIANNA'S PIZZERIA

All pizzas £8.80 each

SPECIAL OFFERS

Buy 1 pizza, get 1 pizza free

OR

35% off the price of every pizza

(a) Lowri orders 3 pizzas.

She wants to pay the least amount possible.

Which offer should Lowri ask for?

Buy 1 pizza, get 1 pizza free ☐

35% off the price of every pizza ☐

You must give the total cost of each of the offers.

You must show all your working.

[5 marks]

continued on the next page . . .

Question 11 continued

11. (b) Noah wants to order 10 pizzas.

Explain why

'buy 1 pizza, get 1 pizza free'

would be the better of the 2 offers.

Do not use any calculations.

[1 mark]

END OF PAPER

TOTAL 65 MARKS

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

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MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

FOUNDATION TIER

THURSDAY, 7 NOVEMBER 2019 – MORNING

Diagram Booklet

Surname:	
First name(s):	
Centre Number:	
Candidate Number:	**0**

Question 2

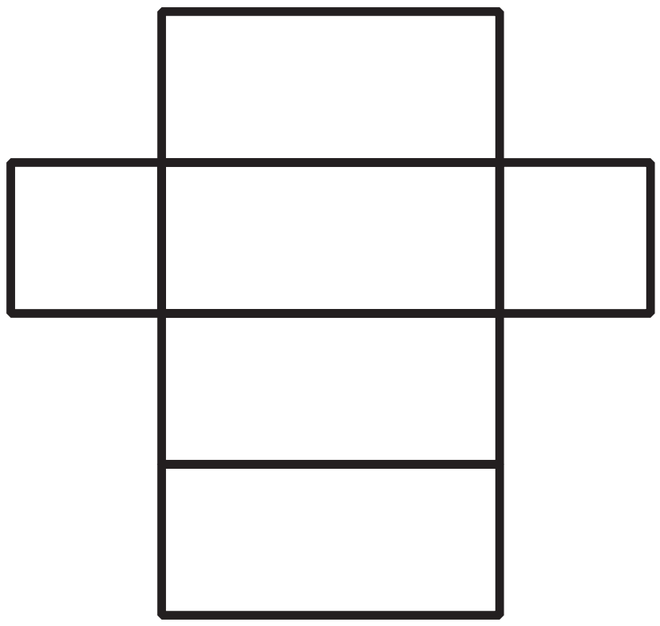
Formula

Total postage costs (£) =

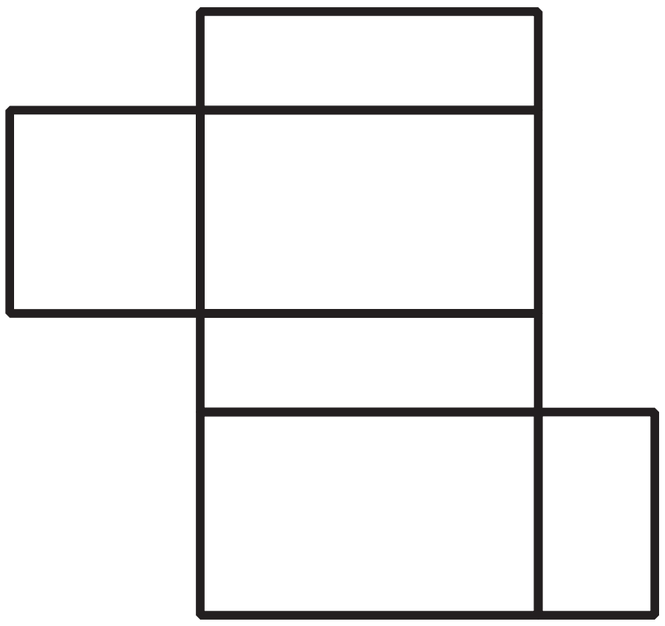
Number of SMALL LETTERS × 0.65 + number of LARGE LETTERS × 0.98

Question 2 (d)

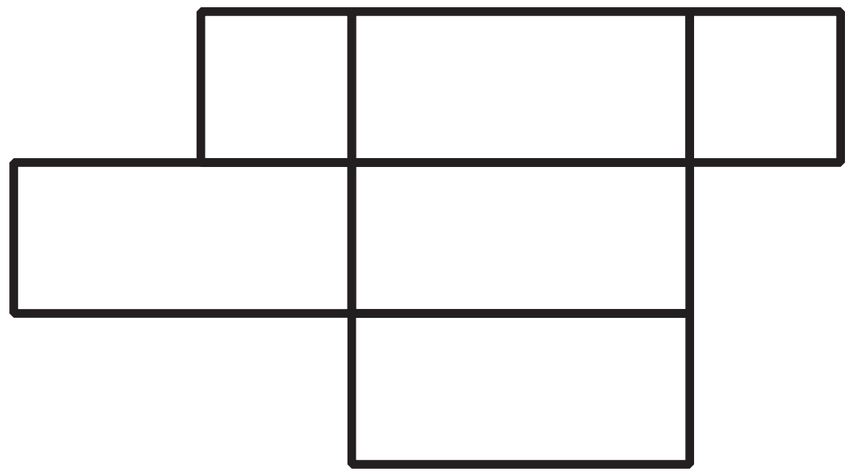
Net A



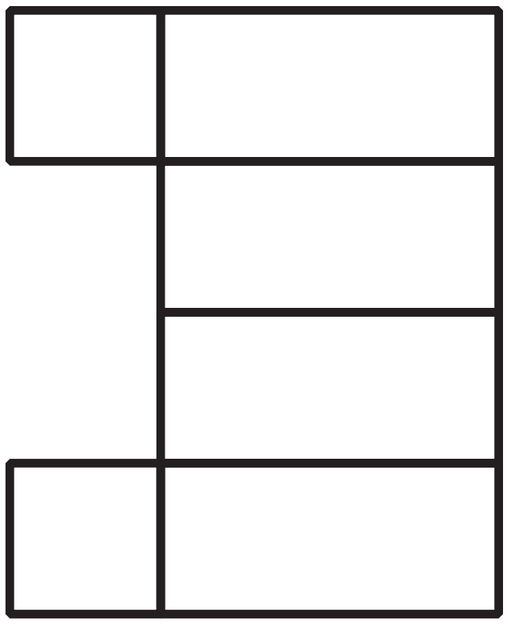
Net B



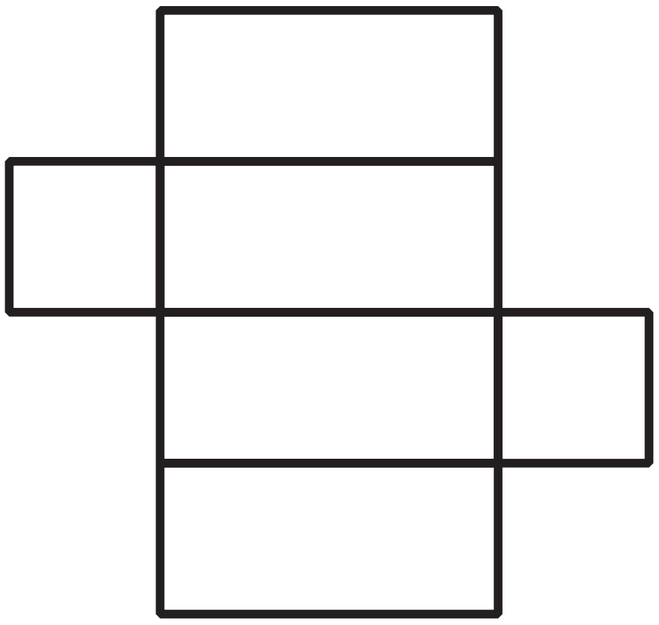
Net C



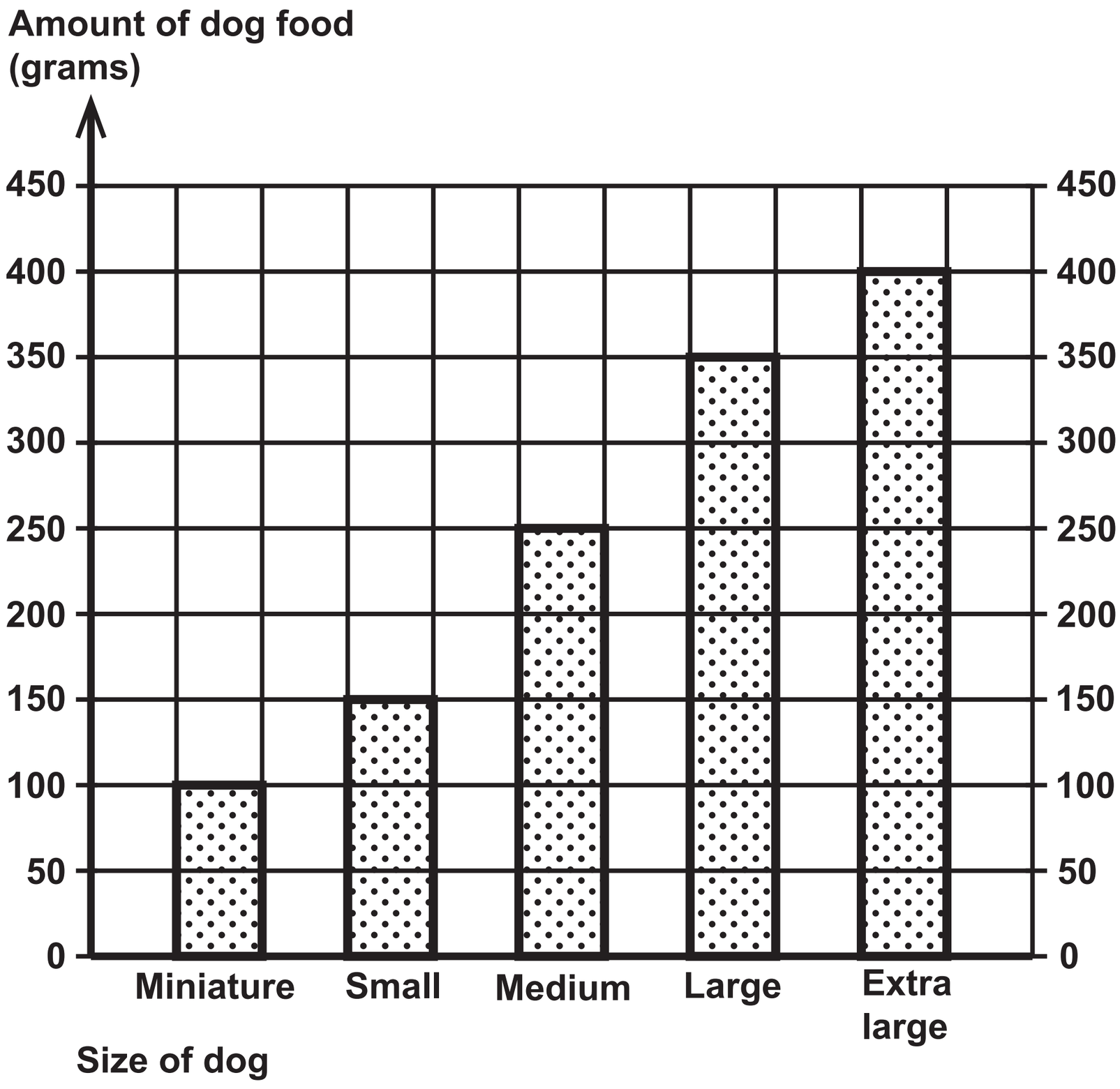
Net D



Net E



Question 3 (b)


Amount of dog food (grams)
450
400
350
300
250
200
150
100
50
0
Miniature
Small
Medium
Large
Extra large
Size of dog

Question 4 (c)

Table

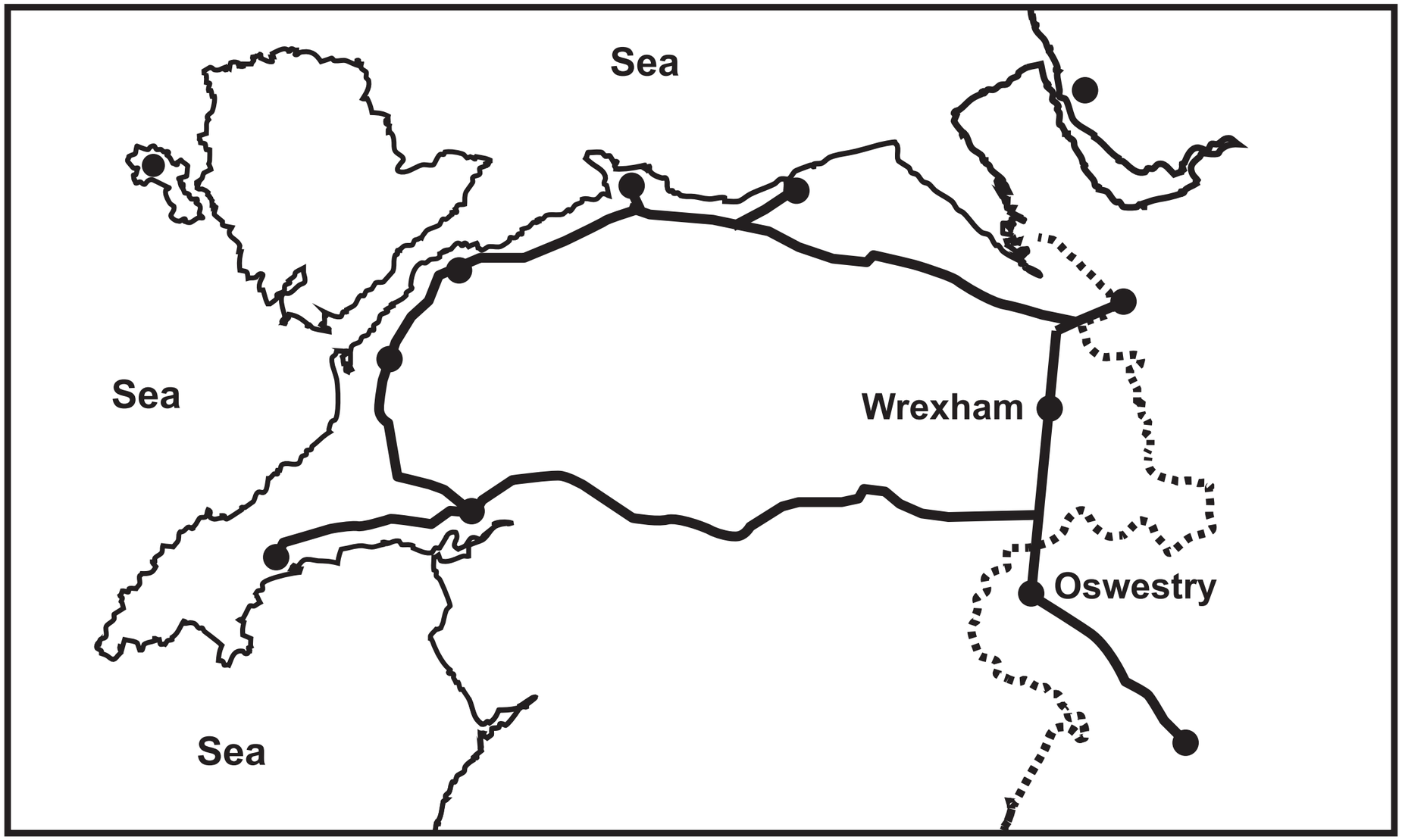
HEIGHT	STEPS PER MILE
5 feet 5 inches	2321 steps
5 feet 6 inches	2286 steps
5 feet 7 inches	2252 steps
5 feet 8 inches	2218 steps
5 feet 9 inches	2186 steps
5 feet 10 inches	2155 steps
5 feet 11 inches	2125 steps
6 feet	2095 steps

Question 6

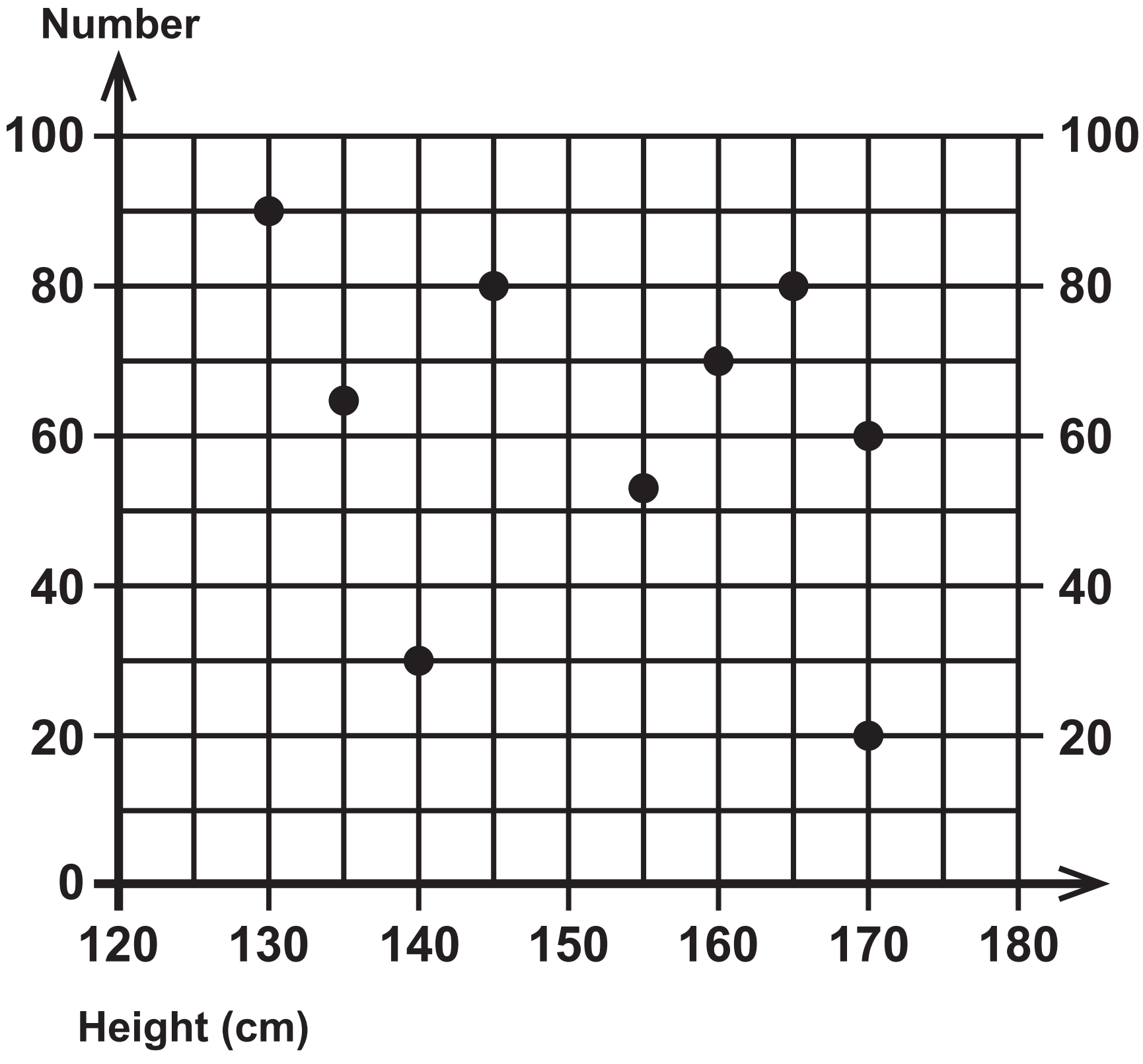
Table

CAPACITY IN LITRES	NUMBER OF BOTTLES	TRADITIONAL NAME
0•75	1	Bottle
1•5	2	Magnum
3		Jéroboam
4•5		Réhoboam
6	8	Methuselah
9	12	Salmanazar
12		Balthazar

Question 9



Question 10



Question 10 (b)

Table

Name	Height (cm)	Number
Gwenda		
Daniel		
Lotte		
Iona		
Steffan		

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MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

FOUNDATION TIER

THURSDAY, 7 NOVEMBER 2019 – MORNING

Spare Diagram Booklet

Surname:	
First name(s):	
Centre Number:	
Candidate Number:	**0**

Question 2

Formula

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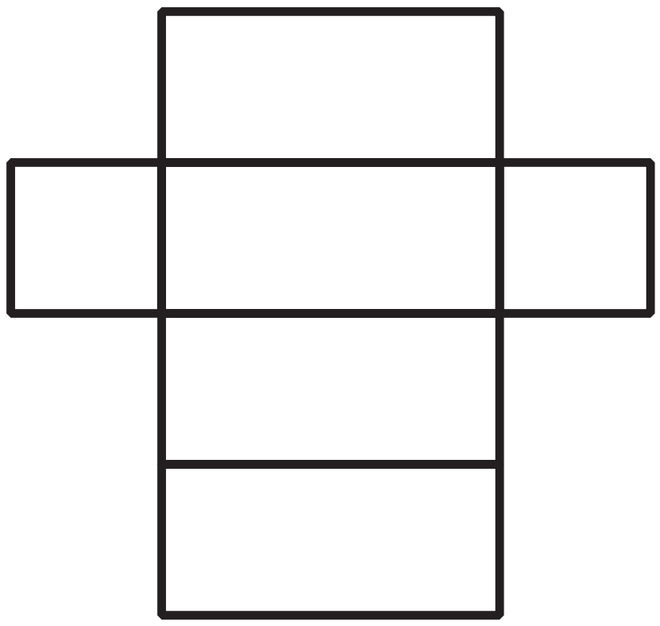
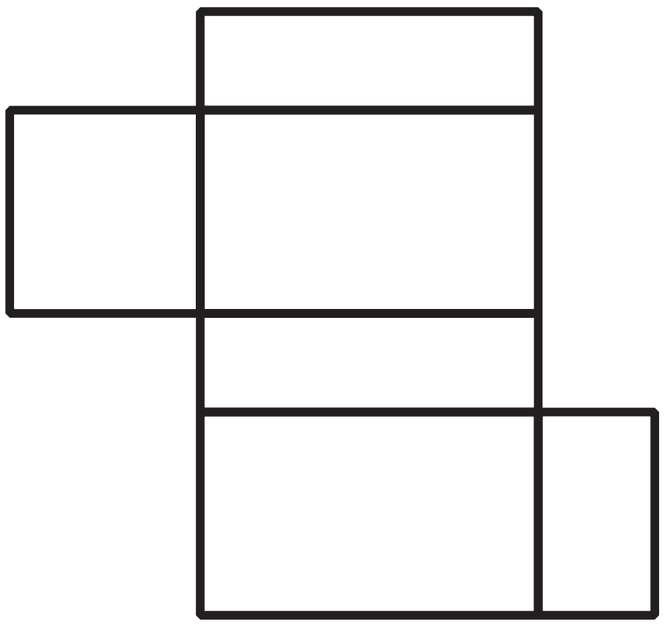
Question 2 (d)

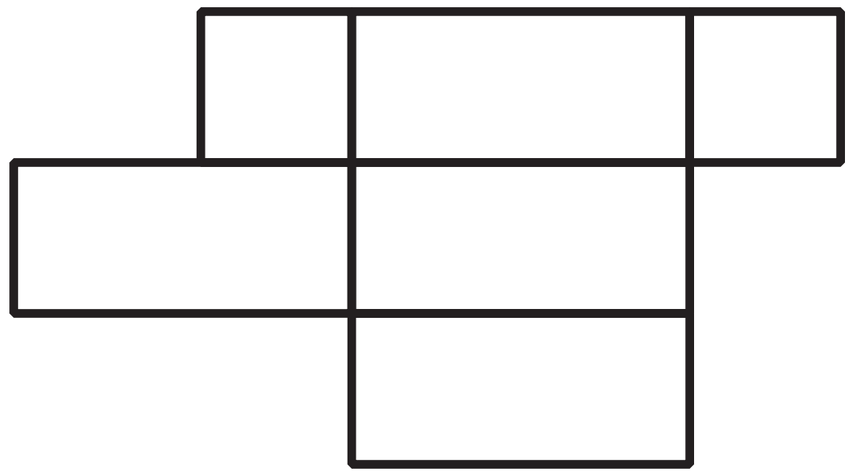
Net A



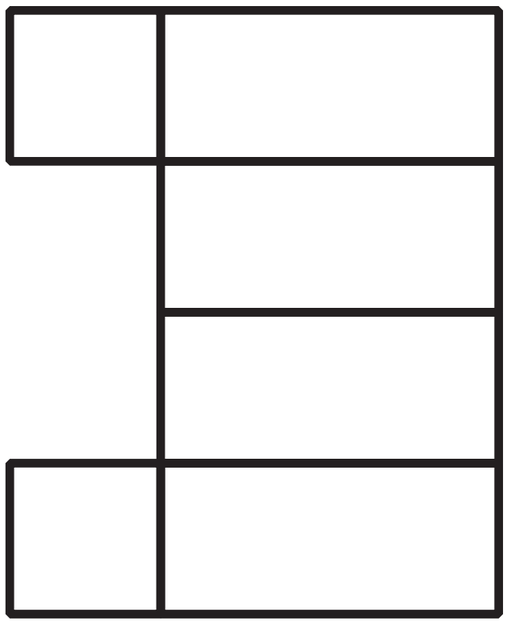
Net B



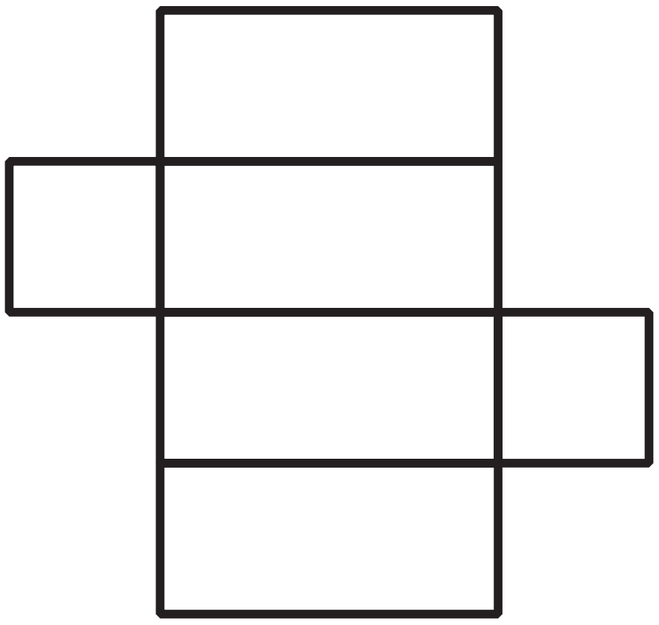
Net C



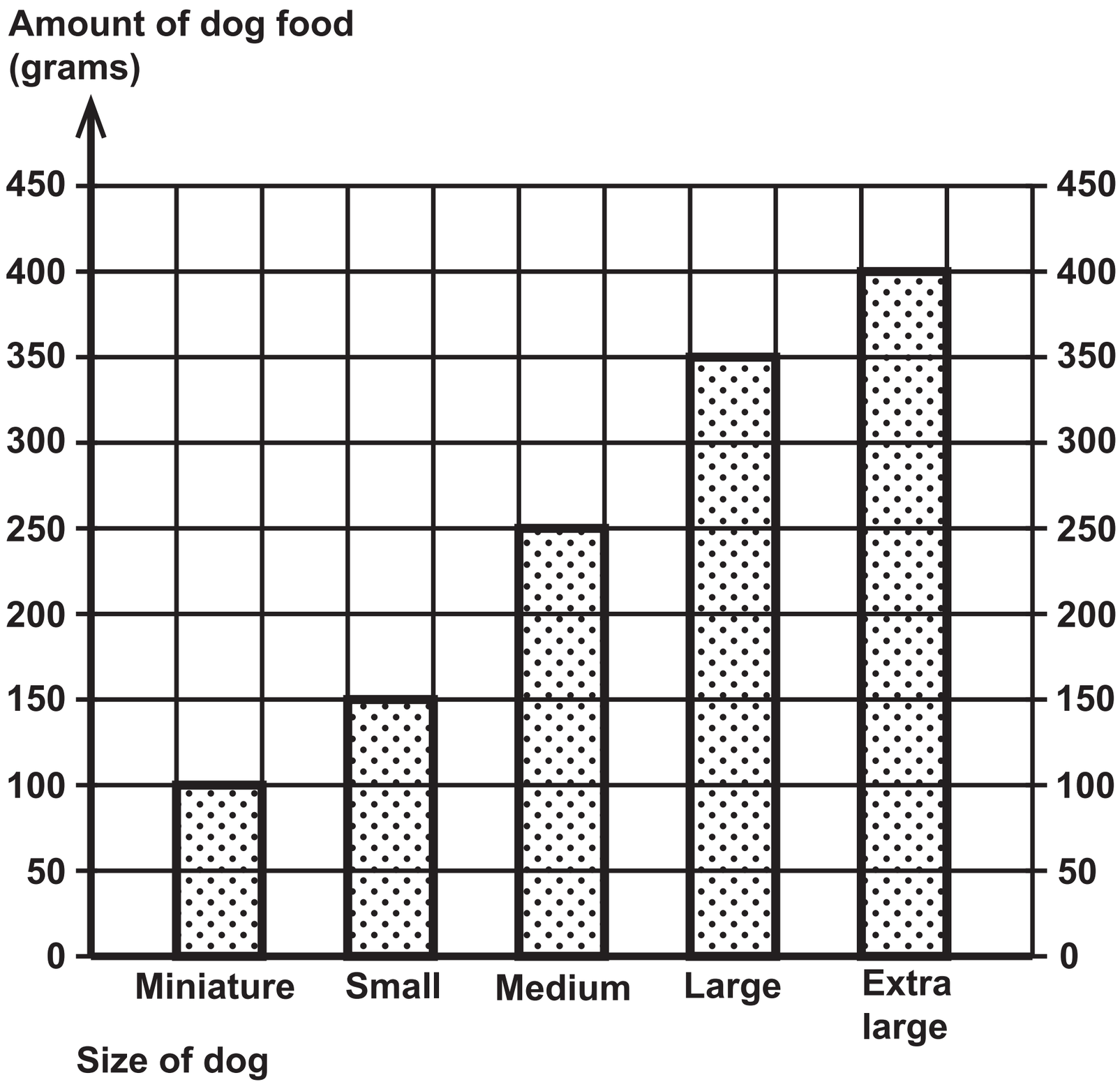
Net D



Net E



Question 3 (b)


Amount of dog food (grams)
450
400
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Miniature
Small
Medium
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Extra large
Size of dog

Question 4 (c)

Table

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Question 6

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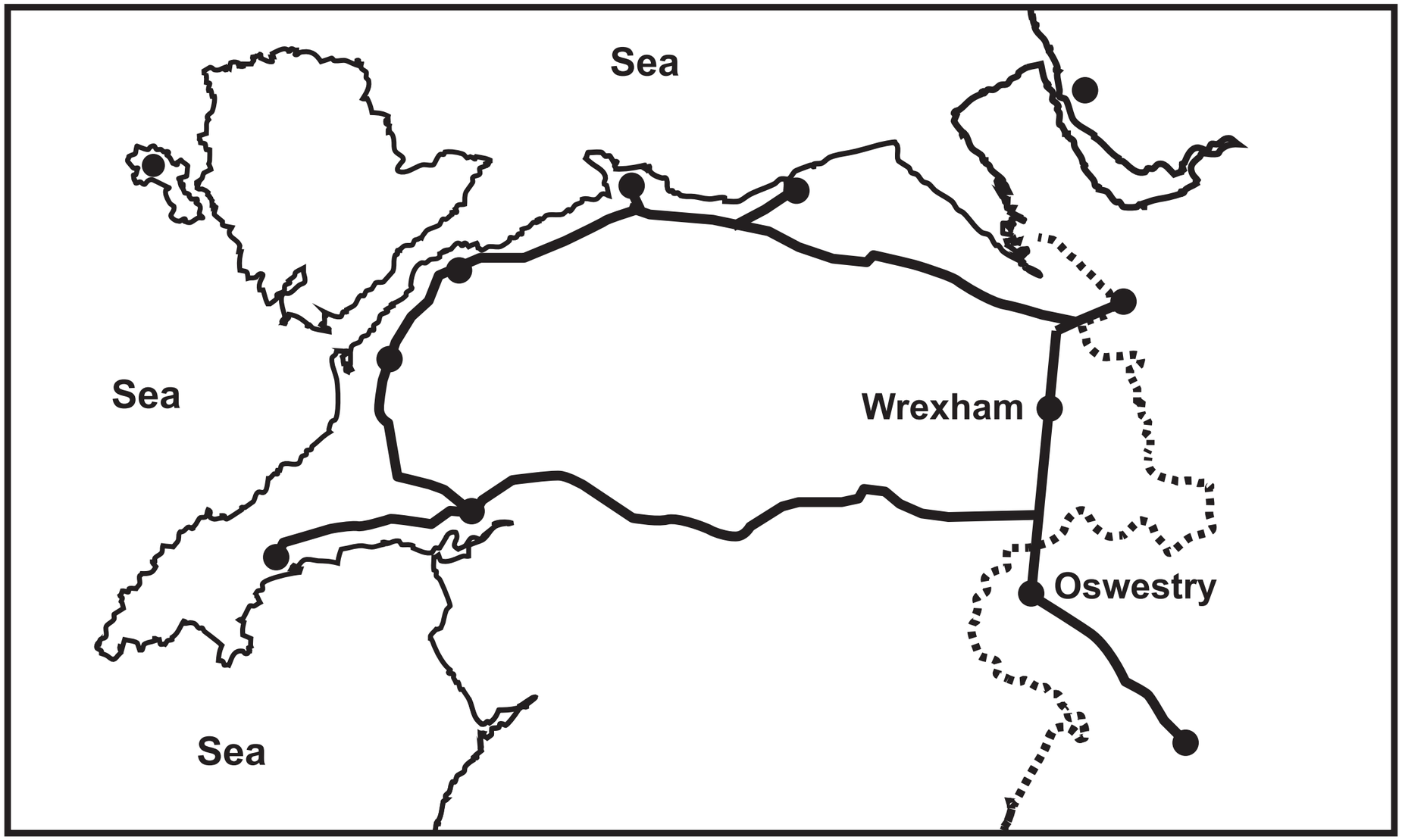
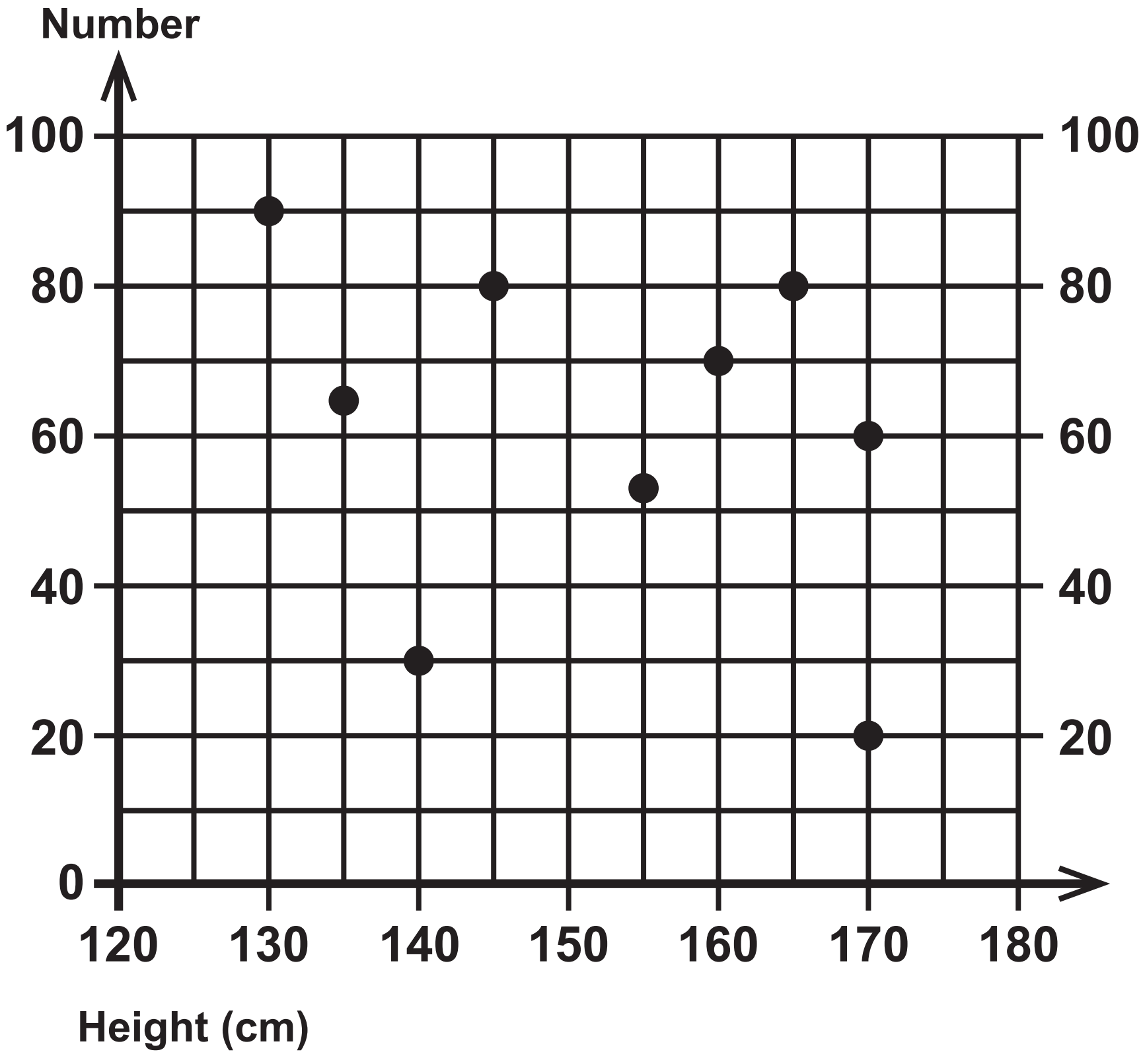
Question 9



Question 10



Question 10 (b)

Table

Name	Height (cm)	Number
Gwenda		
Daniel		
Lotte		
Iona		
Steffan		

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FORMULA LIST
FOUNDATION TIER
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You must not write on these formula pages.

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

Formula List – Foundation Tier

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