

**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	
<b>Total</b>	<b>65</b>	

<b>Surname:</b>	
<b>First name(s):</b>	
<b>Centre Number:</b>	
<b>Candidate Number:</b>	<b>0</b>

**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).**

**(Turn over)**

**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  $\pi$  as 3.14 or use the  $\pi$  button on your calculator.**

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

**(Turn over)**

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

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

**She sees these items in a catalogue from a stationery company.**

**continued on the next page . . .**

**(Turn over)**

**Question 1 continued**

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

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

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

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**(Turn over)**

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**[4 marks]**

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

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**(Turn over)**

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**[2 marks]**

**continued on the next page . . .**

**(Turn over)**

**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?**
- 
- 

**(Turn over)**

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**Mrs Jones can buy**

**\_\_\_\_\_ extra calculators.**

**[2 marks]**

**(Turn over)**

**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 cost = .....**

**143 small letters**

**50 large letters**

**continued on the next page . . .**

**(Turn over)**





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**[3 marks]**

**continued on the next page . . .**

**(Turn over)**

**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**

**(Turn over)**





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**[4 marks + 2 marks OCW]**

**continued on the next page . . .**

**(Turn over)**

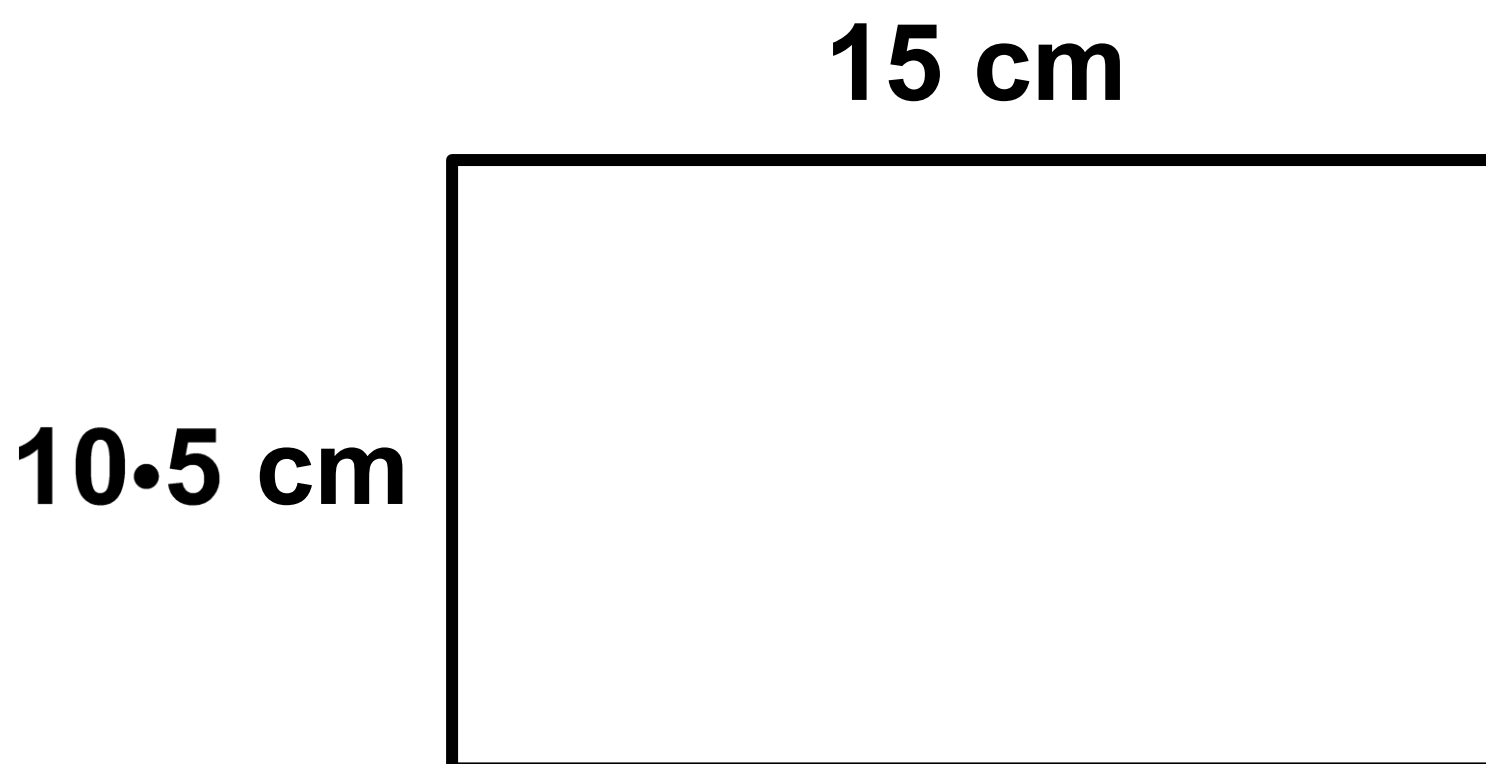
**Question 2 continued**

**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 . . .**

**(Turn over)**

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 <sup>2</sup>	157.5 cm	

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[1 mark]  
(Turn over)

**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 diagram for Question 2 (d) in the separate Diagram Booklet.**

**The diagram shows Net A, Net B, Net C, Net D and Net E.**

**continued on the next page . . .**

**(Turn over)**

**Question 2 (d) continued**

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

**Circle your answers.**

<b>Net A</b>	<b>Net B</b>	<b>Net C</b>	<b>Net D</b>	<b>Net E</b>
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**[2 marks]**

**(Turn over)**

**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.**

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**(Turn over)**

**[2 marks]**

**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.**

**(Turn over)**

**Question 3 (b) continued**

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

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**[2 marks]**

**continued on the next page . . .**

**(Turn over)**

**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?**

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**(Turn over)**



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**The 18 kg bag of food will last for**

**\_\_\_\_\_ days**

**[3 marks]**

**(Turn over)**

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**

<b>TIME</b>	<b>19:38</b>
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<b>STEPS</b>	<b>2656</b>
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**End of the run**

<b>TIME</b>	<b>20:14</b>
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<b>STEPS</b>	<b>10538</b>
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**continued on the next page . . .**

**(Turn over)**

**Question 4 continued**

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

**Circle your answer.**

<b>24 minutes</b>	<b>22 minutes</b>	<b>52 minutes</b>
<b>36 minutes</b>	<b>76 minutes</b>	

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**[1 mark]**

**(Turn over)**

**Question 4 continued**

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

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**[1 mark]**

**continued on the next page . . .**

**(Turn over)**

**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?**

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**(Turn over)**



**34**

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**[4 marks]**

**(Turn over)**

**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.**

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**[3 marks]**

**(Turn over)**

**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.**

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**(Turn over)**

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**[2 marks]**

**continued on the next page . . .**

**(Turn over)**

**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.**

<b>4 bottles</b>	<b>28.5 bottles</b>	<b>10.5 bottles</b>
<b>36 bottles</b>	<b>38 bottles</b>	

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**[1 mark]**

**(Turn over)**

**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?**

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**[2 marks]**

**(Turn over)**

**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.**

**(Turn over)**





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?

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(Turn over)

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[2 marks]

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

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**(Turn over)**

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**[2 marks]**

**continued on the next page . . .**

**(Turn over)**

**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.**

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**(Turn over)**

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**[1 mark]**

**(Turn over)**

- 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.**

**continued on the next page . . .**

**(Turn over)**

**Question 9 continued**

**9. (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.**

<b>1 : 5</b>	<b>1 : 500</b>	<b>1 : 5000</b>
<b>1 : 50 000</b>	<b>1 : 500 000</b>	

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**[1 mark]  
(Turn over)**

**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.**

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**(Turn over)**

**53**

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**Average speed** \_\_\_\_\_ **km/h**

**[3 marks]**

**(Turn over)**

**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.**

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**[1 mark]**

**(Turn over)**

**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]**

**(Turn over)**

**11. Look at the information provided for Question 11 in the separate Diagram Booklet.**

**(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**

**continued on the next page . . .**

**(Turn over)**





**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.**

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**[1 mark]**

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**END OF PAPER**

**TOTAL 65 MARKS**

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**(Turn over)**









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**MATHEMATICS – NUMERACY**

**UNIT 2: CALCULATOR – ALLOWED**

**FOUNDATION TIER**

**THURSDAY, 7 NOVEMBER 2019 – MORNING**

# **Diagram Booklet**

<b>Surname:</b>	
<b>First name(s):</b>	
<b>Centre Number:</b>	
<b>Candidate Number:</b>	<b>0</b>

# Question 1

## Information

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

## Question 2

### Formula

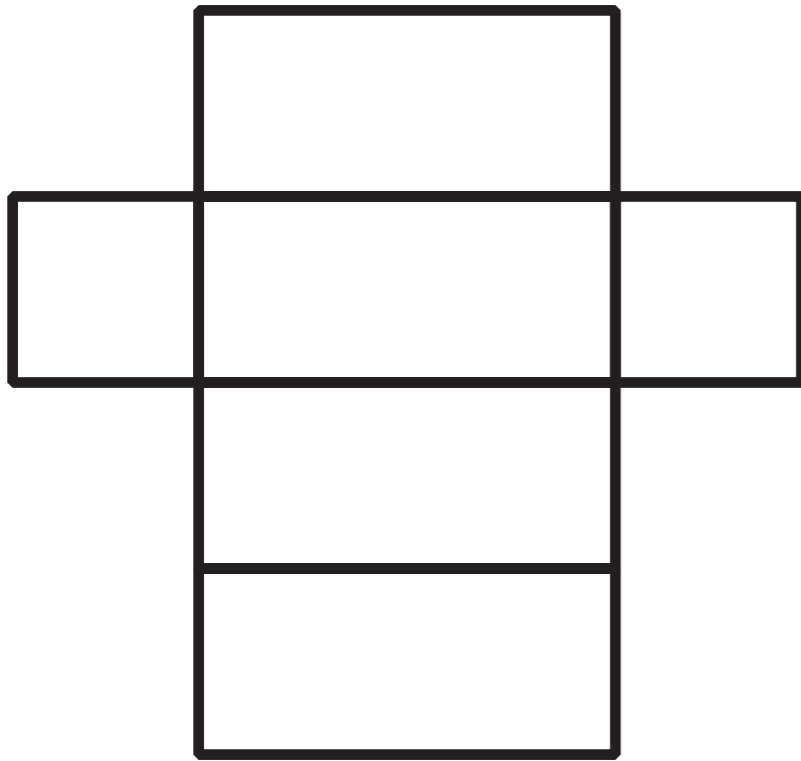
**Total postage costs (£) =**

**Number of SMALL LETTERS × 0.65**

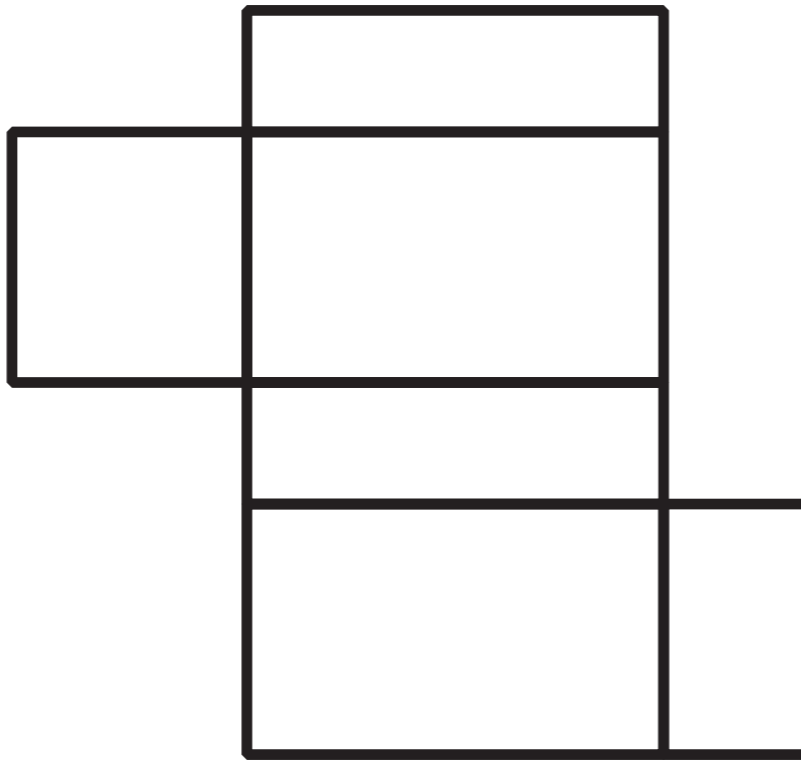
**+ number of LARGE LETTERS × 0.98**

# Question 2 (d)

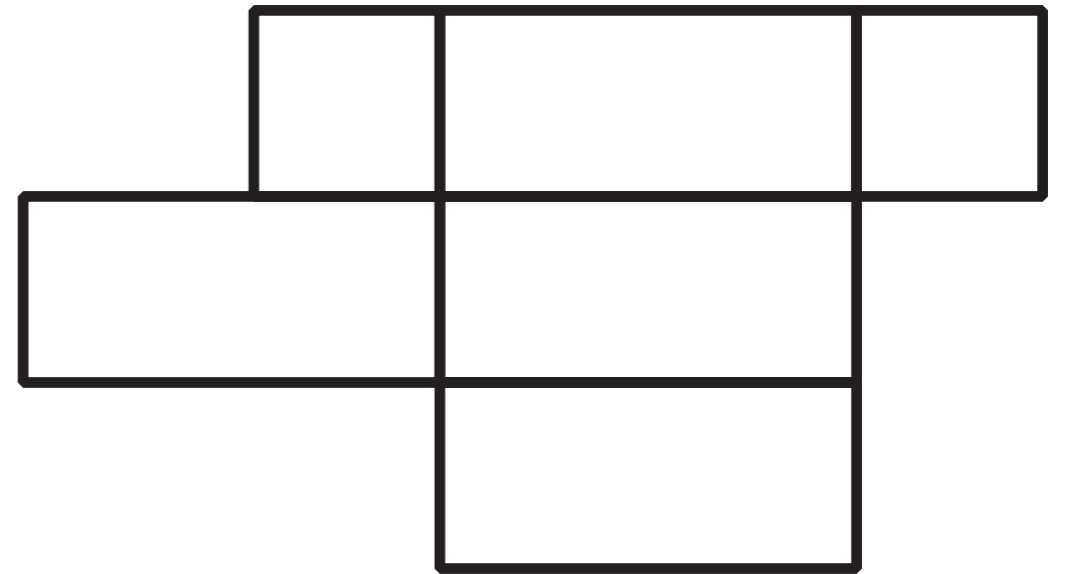
## Net A



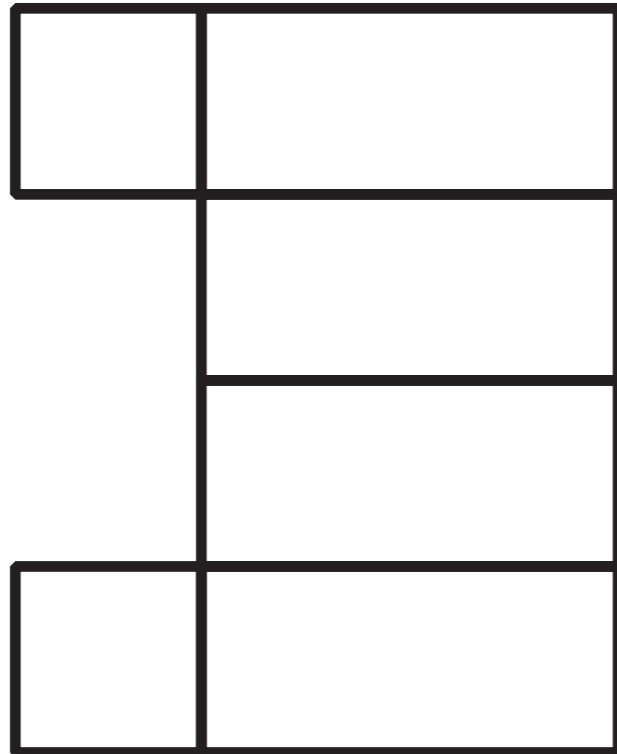
## Net B



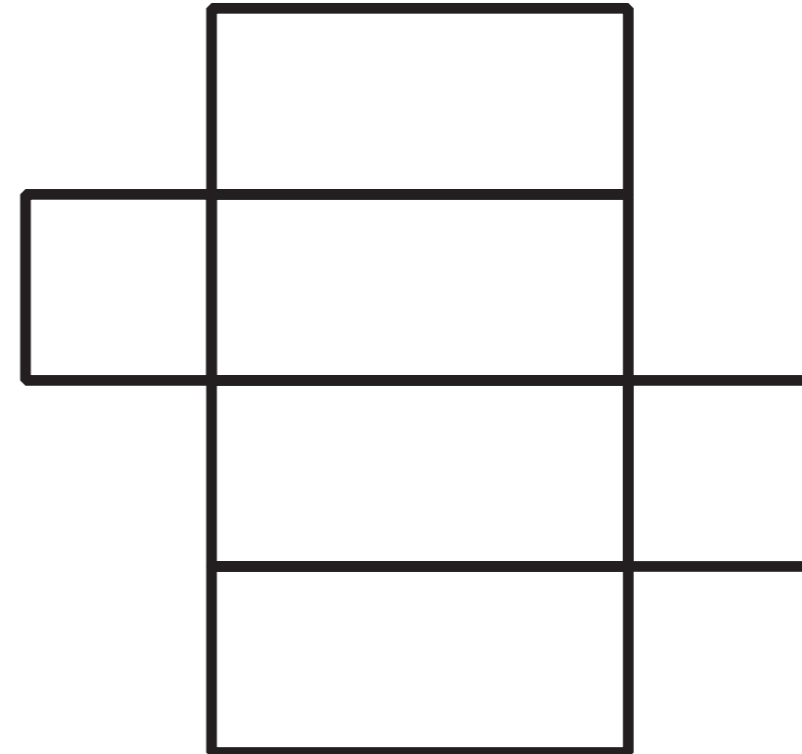
## Net C



## Net D

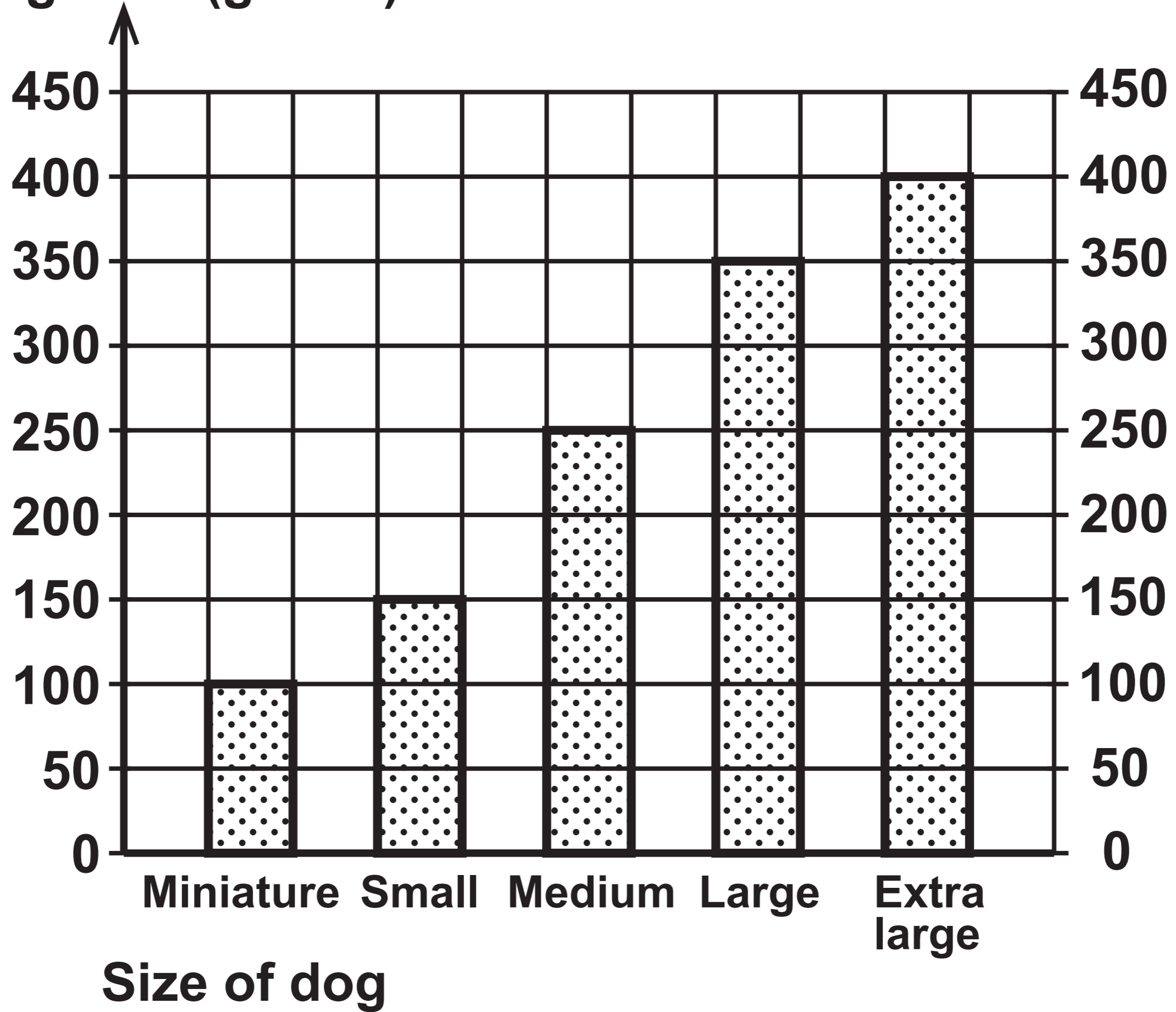


## Net E



**Amount of  
dog food (grams)**

**Question 3 (b)**



## Question 4 (c)

### Table

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

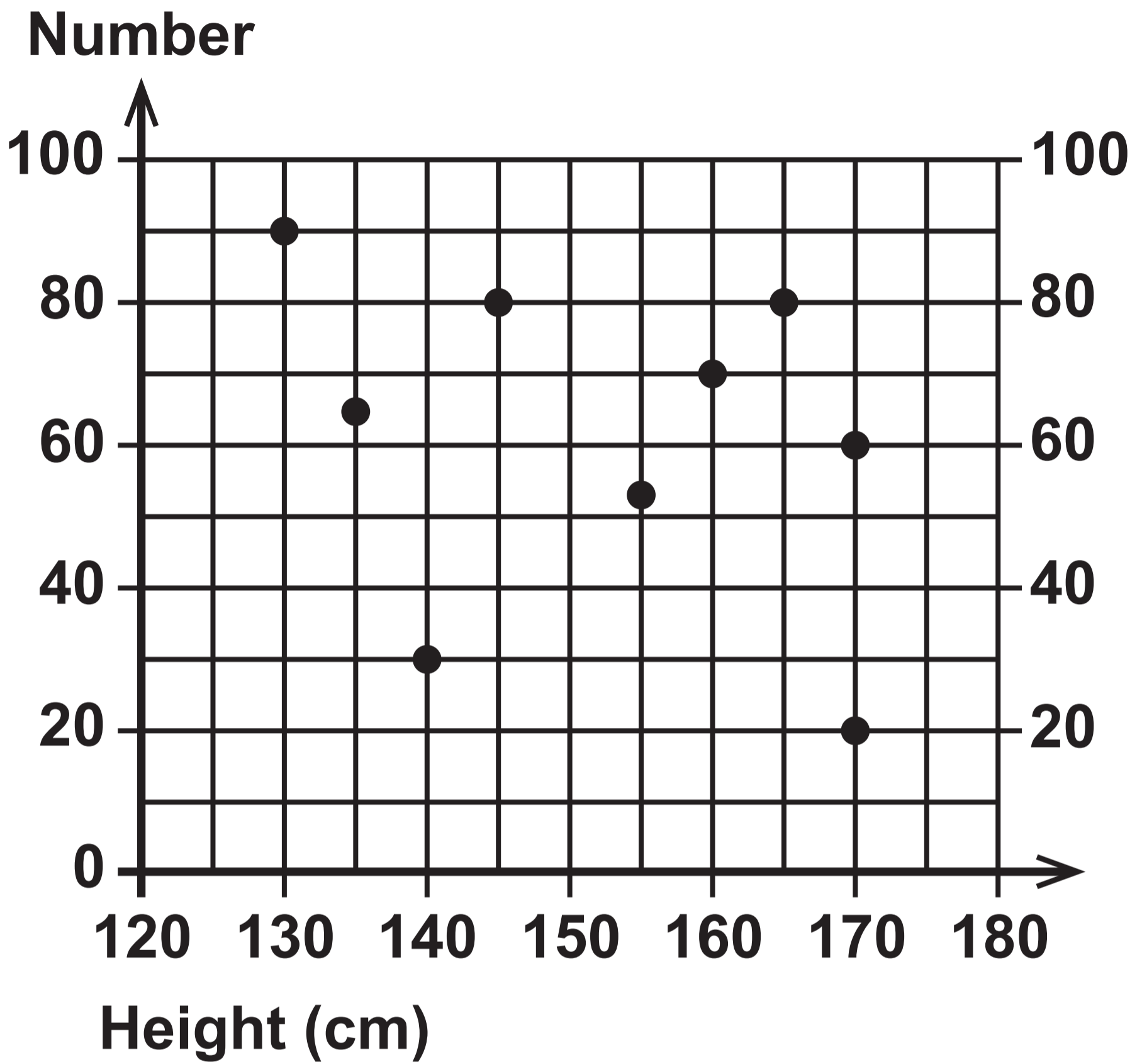
## Question 6

### Table

<b>CAPACITY IN LITRES</b>	<b>NUMBER OF BOTTLES</b>	<b>TRADITIONAL NAME</b>
<b>0.75</b>	<b>1</b>	<b>Bottle</b>
<b>1.5</b>	<b>2</b>	<b>Magnum</b>
<b>3</b>		<b>Jéroboam</b>
<b>4.5</b>		<b>Réhoboam</b>
<b>6</b>	<b>8</b>	<b>Methuselah</b>
<b>9</b>	<b>12</b>	<b>Salmanazar</b>
<b>12</b>		<b>Balthazar</b>



# Question 10



## Question 10 (b)

### Table

<b>Name</b>	<b>Height (cm)</b>	<b>Number</b>
<b>Gwenda</b>		
<b>Daniel</b>		
<b>Lotte</b>		
<b>Iona</b>		
<b>Steffan</b>		

# Question 11

## Information

**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**

**GCSE**

**3310U20-1**



**MATHEMATICS – NUMERACY**

**UNIT 2: CALCULATOR – ALLOWED**

**FOUNDATION TIER**

**THURSDAY, 7 NOVEMBER 2019 – MORNING**

# **Spare Diagram Booklet**

<b>Surname:</b>	
<b>First name(s):</b>	
<b>Centre Number:</b>	
<b>Candidate Number:</b>	<b>0</b>

# Question 1

## Information

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<b>PAIR OF COMPASSES BOX OF 25</b>	<b>£24.59</b>
<b>SCIENTIFIC CALCULATOR</b>	<b>£12.99 EACH</b>

## Question 2

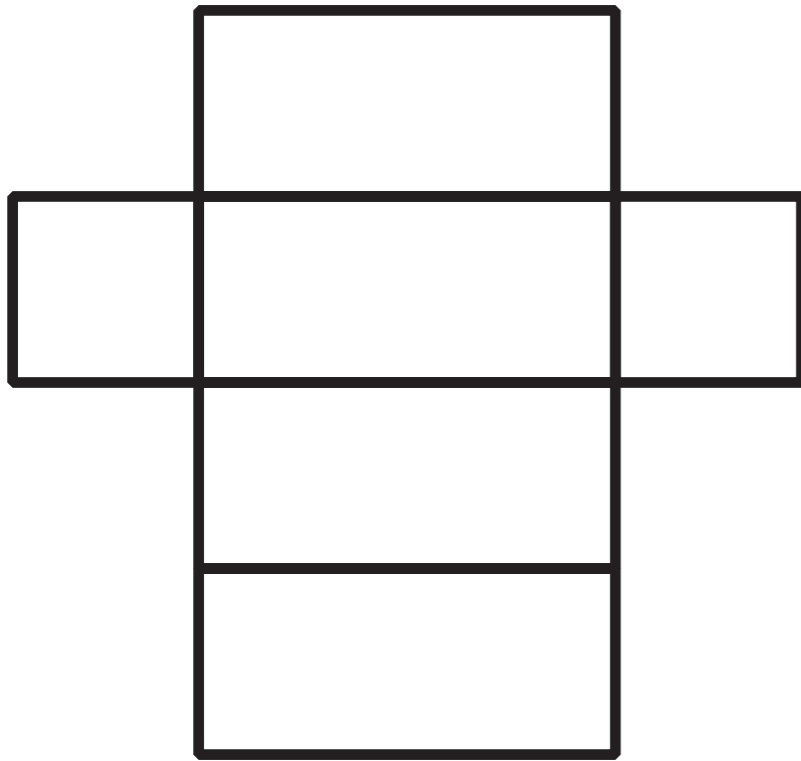
### Formula

**Total postage costs (£) =**

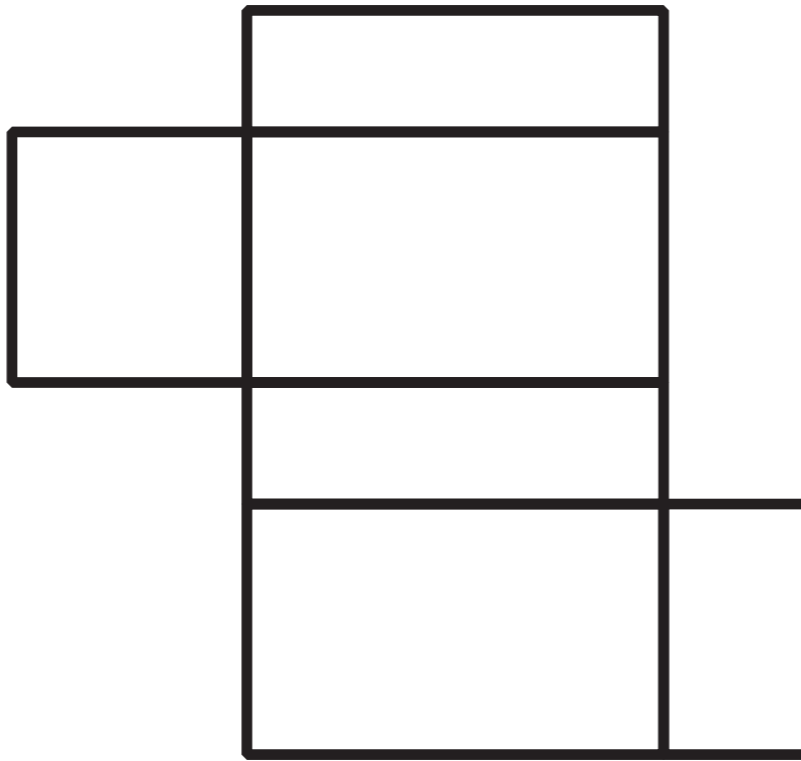
**Number of SMALL LETTERS × 0.65  
+ number of LARGE LETTERS × 0.98**

# Question 2 (d)

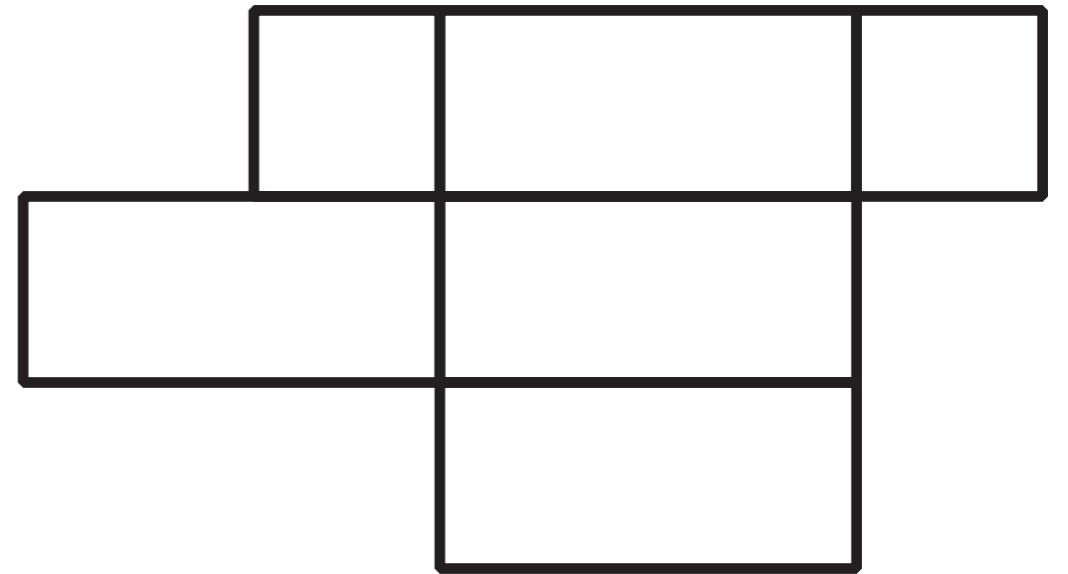
## Net A



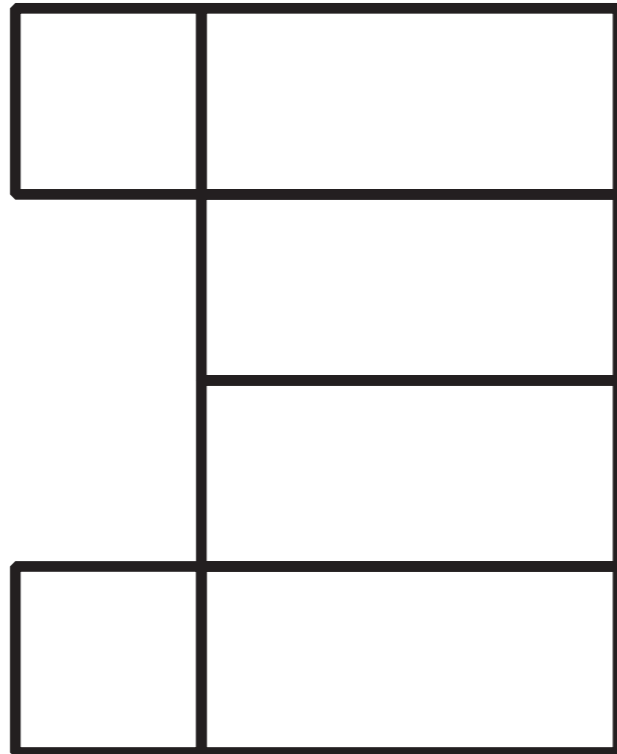
## Net B



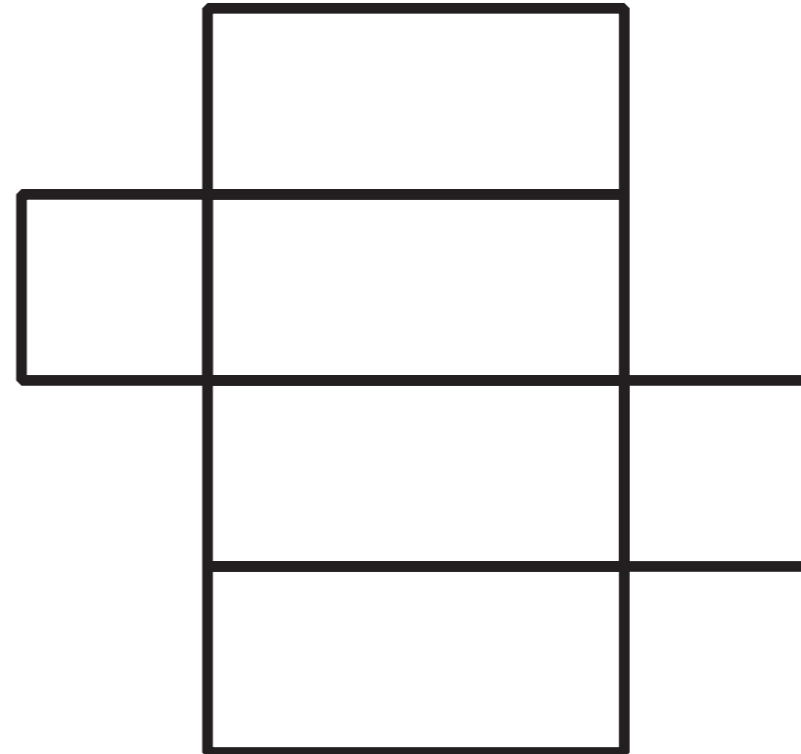
## Net C



## Net D

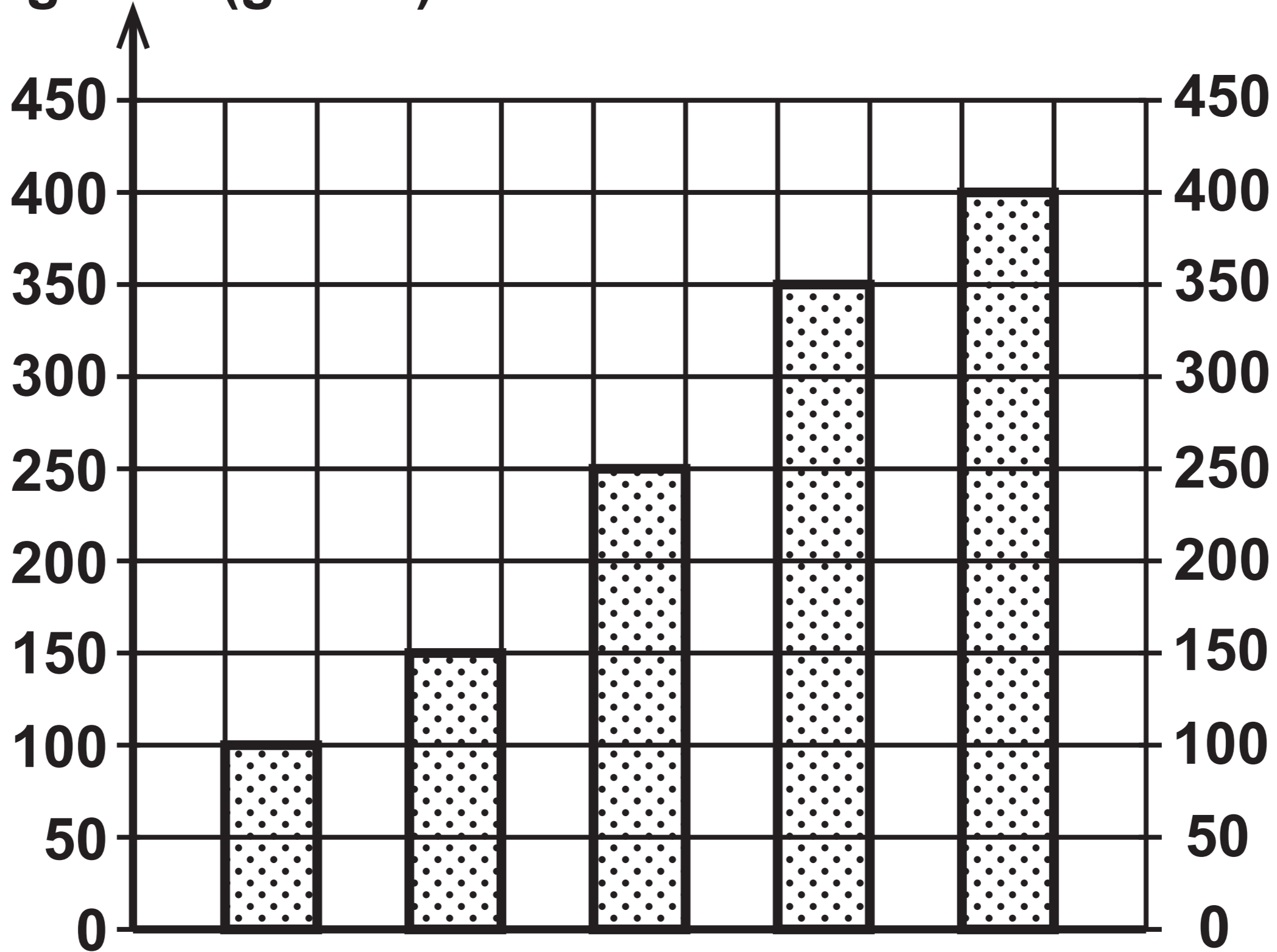


## Net E



**Amount of  
dog food (grams)**

**Question 3 (b)**



**Size of dog**

Miniature   Small   Medium   Large   Extra large

## Question 4 (c)

### Table

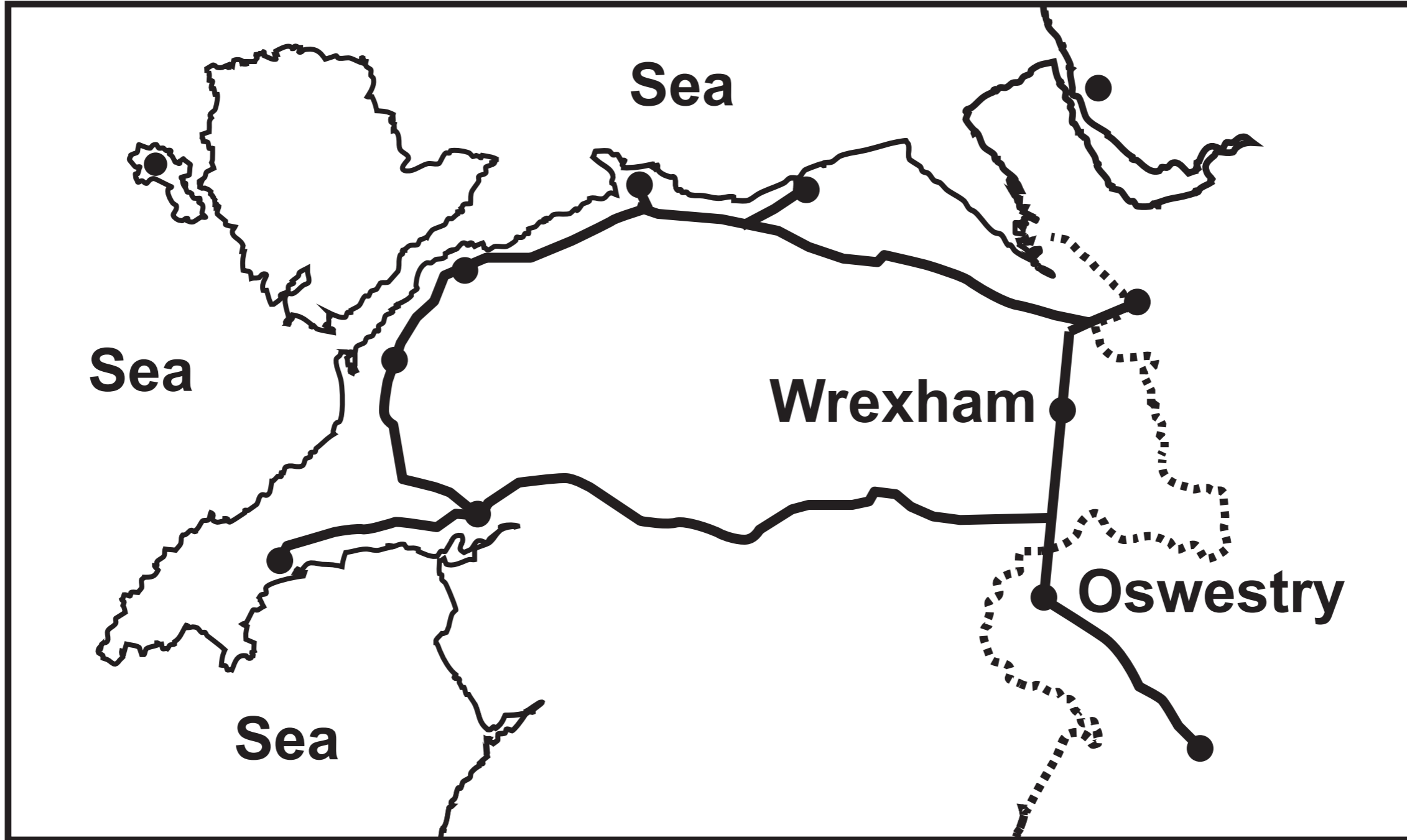
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## Question 6

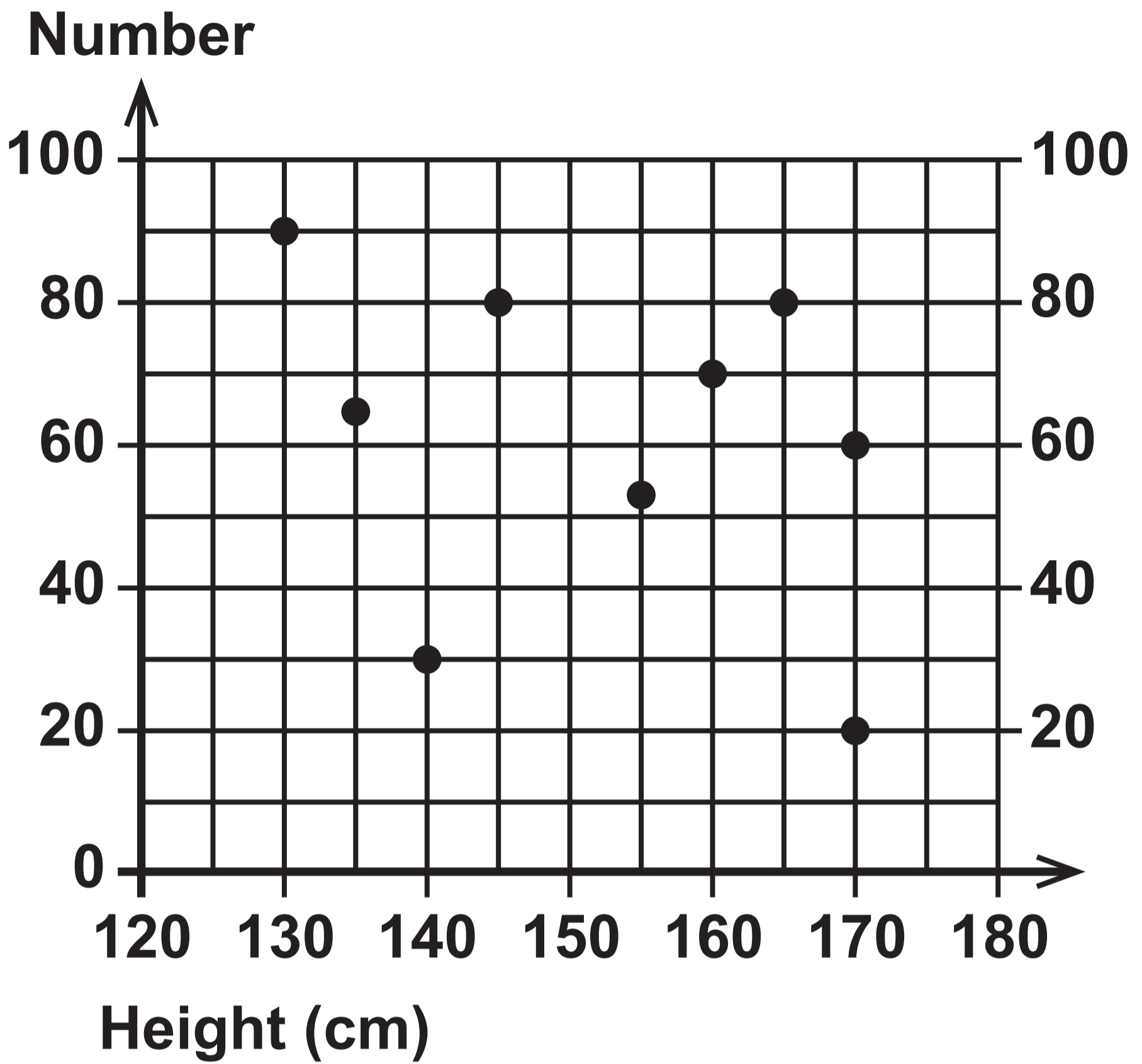
### Table

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<b>9</b>	<b>12</b>	<b>Salmanazar</b>
<b>12</b>		<b>Balthazar</b>

# Question 9



# Question 10



## Question 10 (b)

### Table

<b>Name</b>	<b>Height (cm)</b>	<b>Number</b>
<b>Gwenda</b>		
<b>Daniel</b>		
<b>Lotte</b>		
<b>Iona</b>		
<b>Steffan</b>		

# **Question 11**

## **Information**

**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**

**GCSE  
MATHEMATICS  
and  
NUMERACY**



**FORMULA LIST  
FOUNDATION TIER  
GCSE**

**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  $= \frac{1}{2} (a + b) h$

