GCSE 3310U40-1

MATHEMATICS – NUMERACY
UNIT 2: CALCULATOR – ALLOWED
INTERMEDIATE TIER

THURSDAY, 7 NOVEMBER 2019 – MORNING

1 hour 45 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.	3	
2.	5	
3.	4	
4.	5	
5.	4	
6.	5	
7.	8	
8.	10	
9.	9	
10.	8	
11.	10	
12.	9	
Total	80	

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 9.

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•14 or use the π 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 7 (a), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

1. 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.

(Turn over)

[3 marks]

2. Look at the table for Question 2 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 2 continued

2. (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]

Question 2 continued

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

How many Salmanazars can be filled from this barrel?

[2 marks]

3. 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)

[4 marks]

4. (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]

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

[2 marks]

continued on the next page . . .

Question 4 continued

4. (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]

5. Look at the diagram for Question 5 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 . . .

Question 5 continued

5. (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 5 continued

5. (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]

6. Look at the diagram for Question 6 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]

Question 6 continued

6. (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 6 (b) in the separate Diagram Booklet.

[4 marks]

7. Look at the information provided for Question 7 in the separate Diagram Booklet.

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

Lowri orders 3 pizzas.

She wants to pay the least amount possible.

continued on the next page . . .

Question 7 (a) continued

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.

(Turn over)

[5 marks + 2 marks OCW]

continued on the next page . . .

Question 7 continued

7. (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]

8. (a) Rowan lives in New Zealand.

Rowan wants to post a number of packages.

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

The diagram represents New Zealand postage stamps.

He has 10 of each of the stamps shown.

1 New Zealand dollar ($1)

= 100 cents (100c)

continued on the next page . . .

Question 8 (a) continued

Rowan wants to:

- **put the correct postage on each package,**
- **use as FEW of his stamps as possible.**

Select the stamps he needs to post each of the following packages.

8. (a) (i) Documents, postage $3.60

[2 marks]

continued on the next page . . .

Question 8 (a) continued

8. (a) (ii) Birthday present, postage $7.40

[2 marks]

Question 8 continued

8. (b) Rowan is coming to Wales on holiday.

The conversion rate at the exchange shop is $1 = £0.53

The exchange shop only has £10 and £20 notes.

Rowan only has $550 saved.

He wants to exchange as close to $550 as possible.

He asks for as few notes as possible.

continued on the next page . . .

Question 8 (b) continued

Calculate:

- **how many of each British note Rowan gets,**
- **how much he pays for his currency, correct to the nearest cent.**

You must show all your working.

(Turn over)

(Turn over)

[6 marks]

9. Ask for the model for Question 9.

The model is NOT made to scale.

The model represents a solid concrete step.

The step:

- stands on horizontal ground,
- has all of its edges vertical or horizontal,
- has a uniform cross – section.

continued on the next page . . .

Question 9 continued

9. (a) Look at the diagrams for Question 9 (a) in the separate Diagram Booklet.

Which diagram, X, Y or Z is the plan view of the concrete step.

Diagram _____

[1 mark]

continued on the next page . . .

Question 9 continued

9. (b) The volume of concrete in the step is 66 000 cm^3

(i) The concrete to make the step costs 39p per litre.

A builder charges a rate of £27 per hour.
Any fraction of an hour is charged as that fraction of his hourly rate.
(For example, half an hour is charged at half of £27)

continued on the next page . . .

Question 9 (b) (i) continued

It takes him 1 hour 20 minutes to make the step.

There were no other costs. Calculate the total cost of making the step.

(Turn over)

[3 marks]

continued on the next page . . .

Question 9 (b) continued

9. (b) (ii) Calculate the length of the step.

Give your answer in cm.

You must show all your working.

(Turn over)

[5 marks]

10. (a) 40 people were asked how many mugs they have in their cupboards.
The results are shown below.

Number of mugs	Frequency
1 to 5	3
6 to 10	7
11 to 15	12
16 to 20	18

continued on the next page . . .

Question 10 (a) continued

10. (a) (i) From this data, which group contains the MEDIAN number of mugs? Circle your answer.

Can't tell	1 to 5	6 to 10
11 to 15	16 to 20	

[1 mark]

continued on the next page . . .

Question 10 (a) continued

10. (a) (ii) Calculate an estimate of the mean number of mugs these people have in their cupboards.

[4 marks]

continued on the next page . . .

Question 10 continued

10. (b) A cylindrical mug has an inner radius of 4·3 cm and an inner height of 11·8 cm.

Tea is poured into the mug.

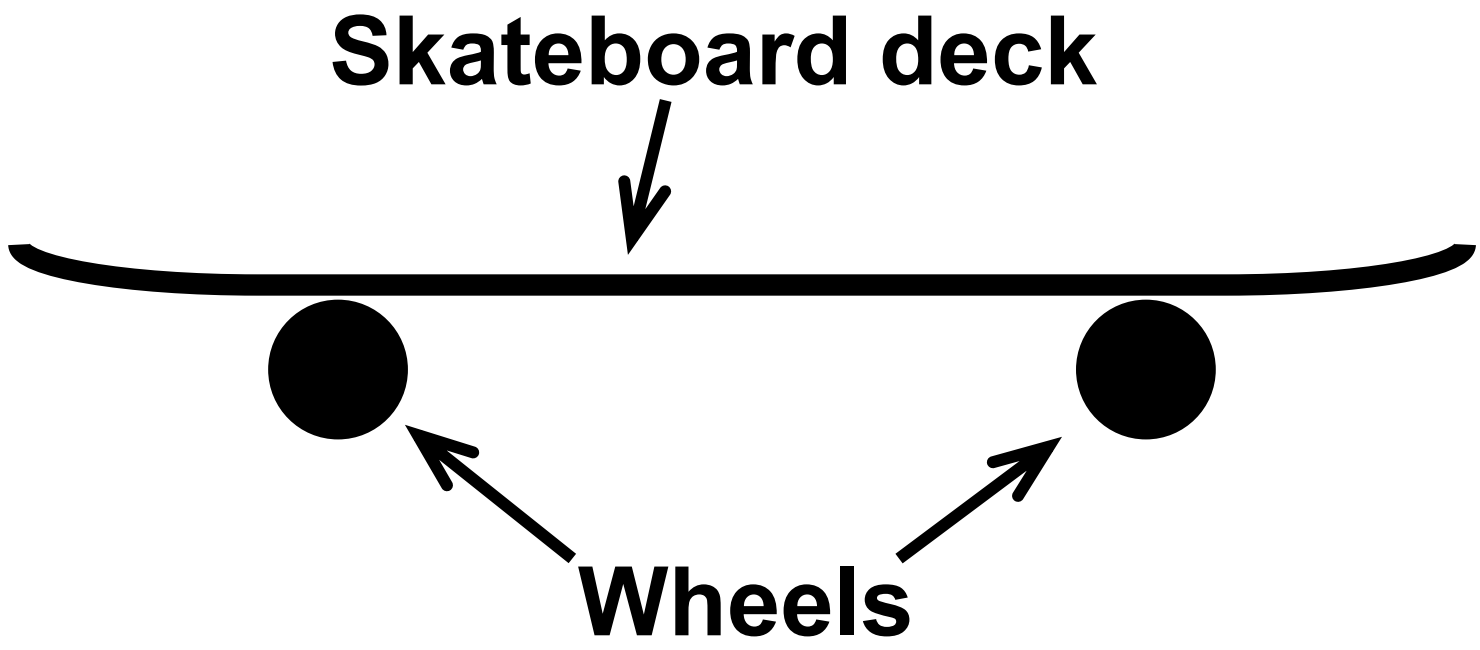
The level of the tea is 2 cm below the top of the mug.

Calculate the volume of the tea in the mug.

[3 marks]

11. Finbar's skateboard is shown below.

The diagram is NOT drawn to scale.



(a) The diameter of each wheel on Finbar's skateboard is 6·4 cm.

He uses his skateboard to go to visit his friend Sab.

Sab lives 2340 metres from Finbar.

continued on the next page . . .

Question 11 (a) continued

11. (a) (i) When Finbar visits Sab, how many times will each wheel on Finbar's skateboard rotate?

[4 marks]

Question 11 continued

11. (a) (ii) What assumption did you make in answering (a) (i)?

[1 mark]

continued on the next page . . .

Question 11 continued

11. (b) A skateboard deck is usually made from one of maple wood, fibreglass or plastic.

The density of these materials is given in the table below.

Skateboard deck material	Density (g/cm^3)
Maple wood	0•7
Fibreglass	2•6
Plastic	1•8

continued on the next page . . .

Question 11 (b) continued

Look at the table for Question 11 (b) in the separate Diagram Booklet.

Finbar and Sab compare their skateboards.

The wheels and the fittings on both their skateboards are identical.

How much heavier is Finbar's skateboard than Sab's skateboard?

Give your answer in grams.

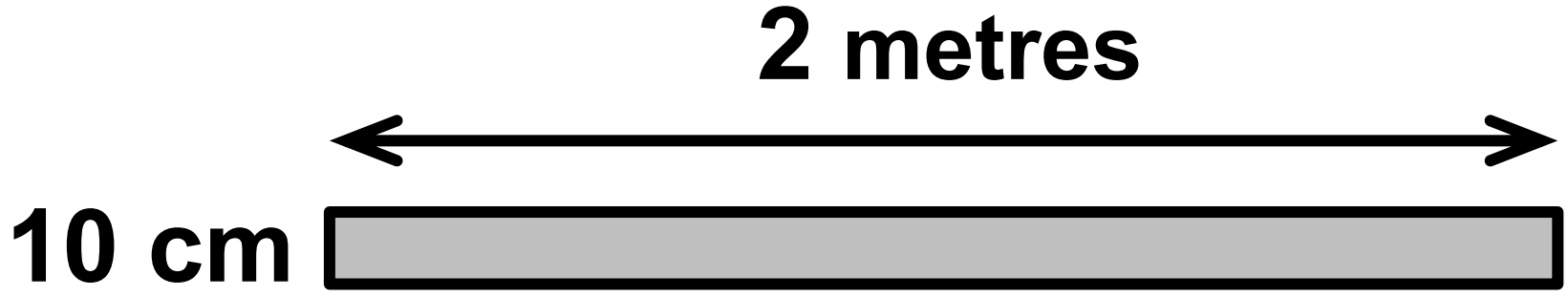
You must show all your working.

(Turn over)

(Turn over)

[5 marks]

12. Robyn has 5 planks of wood, each of length 2 m and width 10 cm as shown in the diagram below.
The diagram is NOT drawn to scale.



Look at Diagram 1 for Question 12 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

Robyn lays the 5 planks horizontally on the floor.
She leaves a 15 cm GAP between each plank, as shown in Diagram 1.

continued on the next page . . .

Question 12 continued

Look at Diagram 2 for Question 12 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

Robyn is planning to make a gate. She uses these 5 planks and one other plank that is to be placed diagonally, as shown in Diagram 2.

12. (a) (i) Calculate an estimate of the length of the plank that is to be placed diagonally.

Give your answer in metres.

_____

_____

[4 marks]

continued on the next page . . .

Question 12 (a) continued

12. (a) (ii) What assumption did you make in calculating the length of the plank that is to be placed diagonally?

[1 mark]

continued on the next page . . .

Question 12 continued

12. (b) Look at the diagram for Question 12 (b) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

Robyn finishes the gate with two end planks of wood.

The costs of the different sizes of planks of wood are in the following ratio:

horizontal plank : diagonal plank : end plank

= 3 : 4 : 5

continued on the next page . . .

Question 12 (b) continued

An end plank costs £8.55

Calculate the total cost of the planks needed to make the gate.

[4 marks]

END OF PAPER

TOTAL 80 MARKS

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

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

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

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

GCSE

3310U40-1

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

THURSDAY, 7 NOVEMBER 2019 – MORNING

Diagram Booklet

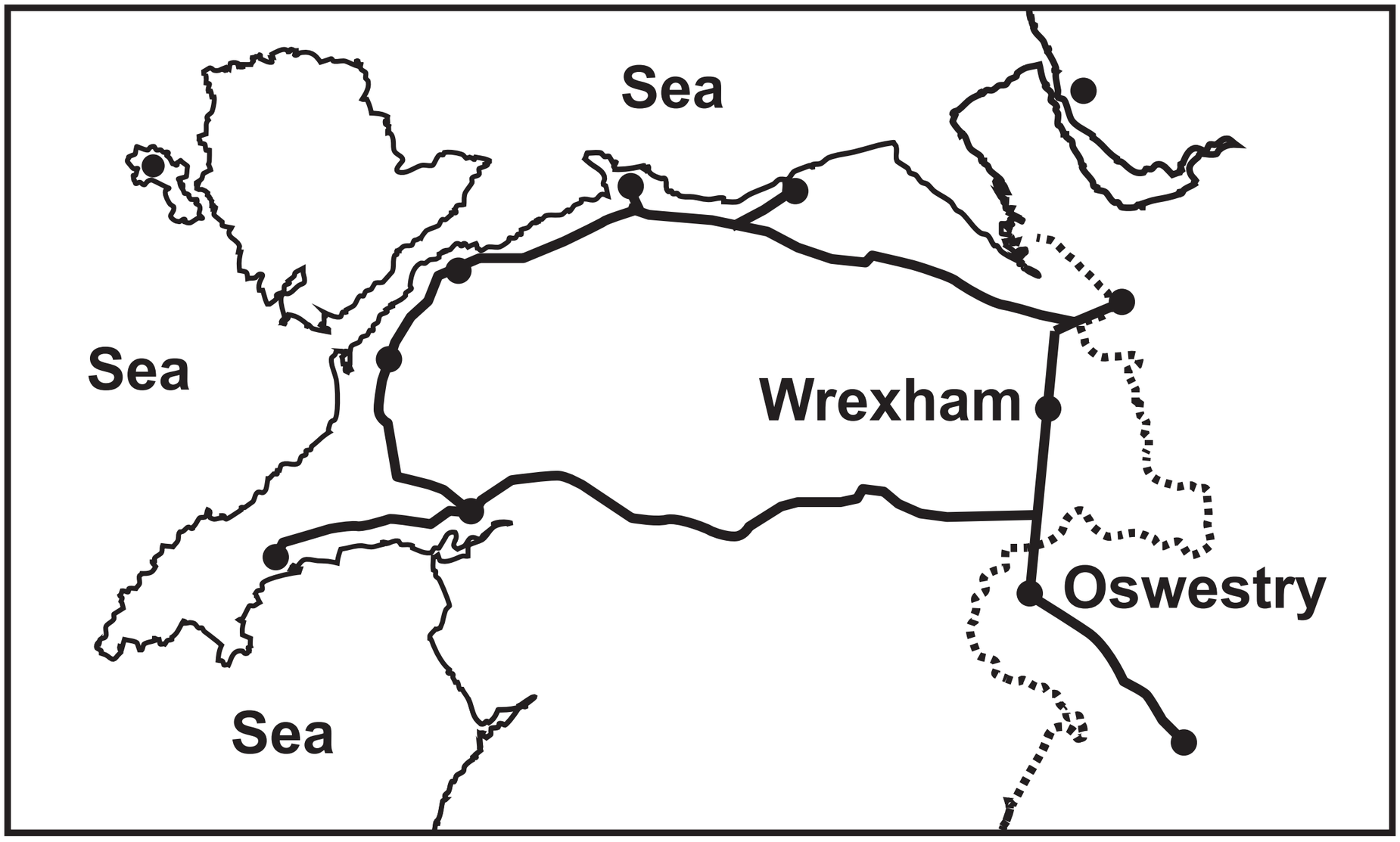
Surname:	
First name(s):	
Centre Number:	
Candidate Number:	**0**

Question 2

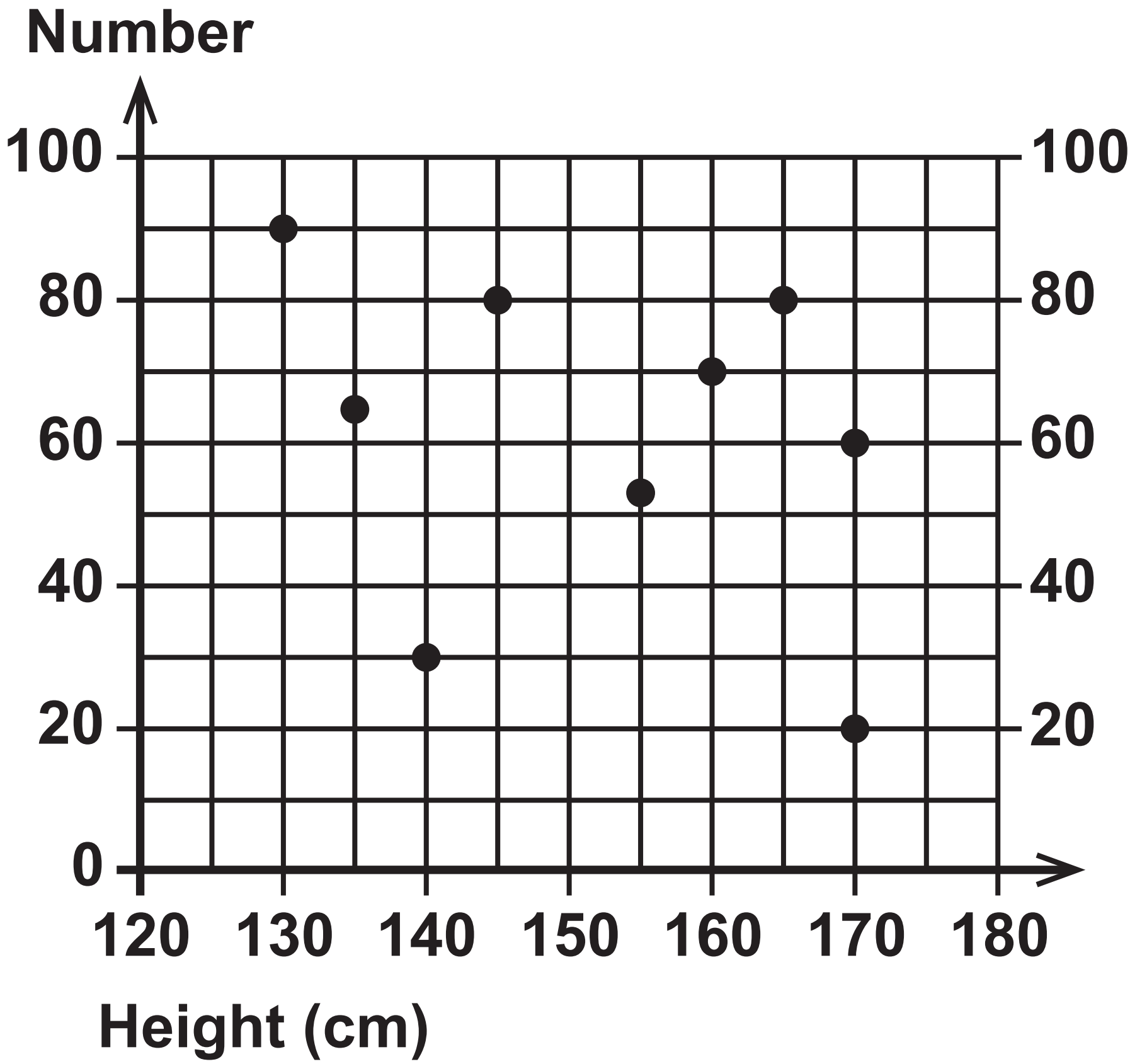
Table

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 5



Question 6



Question 6 (b)

Table

Name	Height (cm)	Number
Gwenda		
Daniel		
Lotte		
Iona		
Steffan		

Question 7

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

Question 8 (a)

New Zealand postage stamps

1 New Zealand dollar ($1) = 100 cents (100c)

10c New Zealand	30c New Zealand	40c New Zealand

$1.60 New Zealand	$1.80 New Zealand	$2.30 New Zealand	$2.80 New Zealand

Question 9 (a)

Diagram X

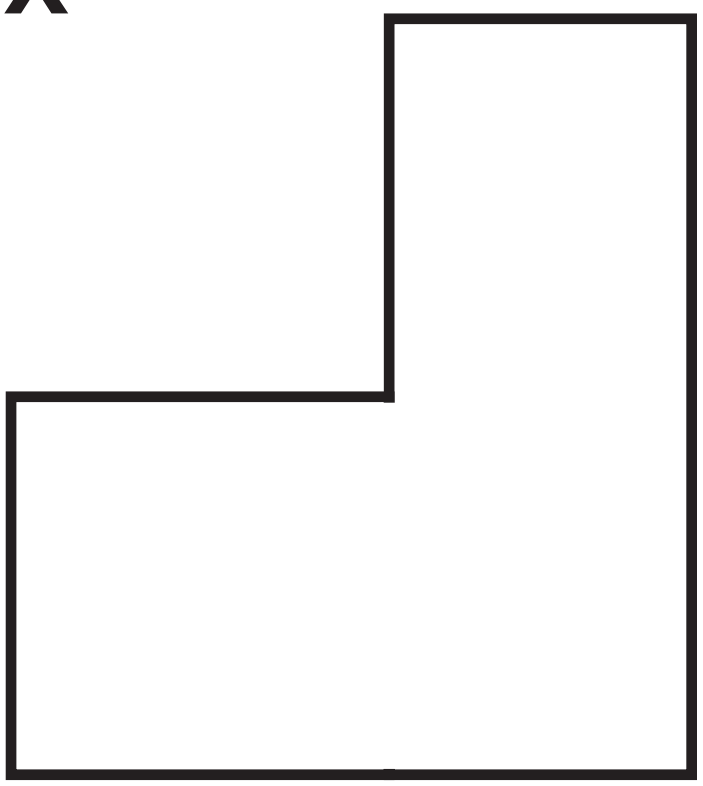
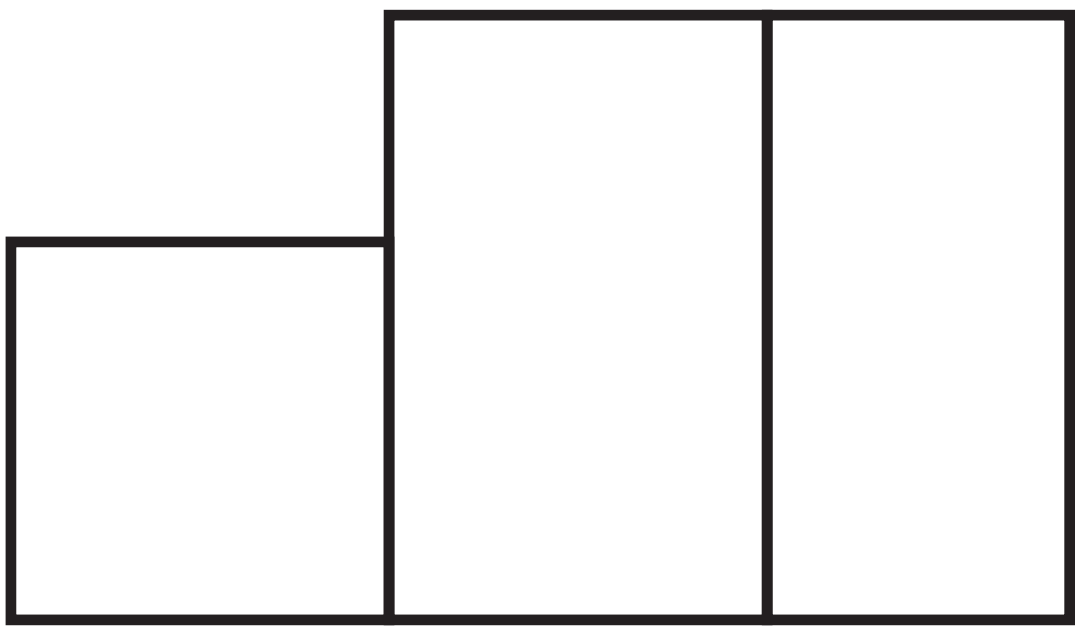


Diagram Y

Diagram Z



Question 11 (b)

Table

	Finbar's skateboard	Sab's skateboard
Area of the skateboard deck	1800 cm^2	1600 cm^2
Thickness of the skateboard deck	1•2 cm	1•4 cm
Material used to make the deck	Fibreglass	Maple wood

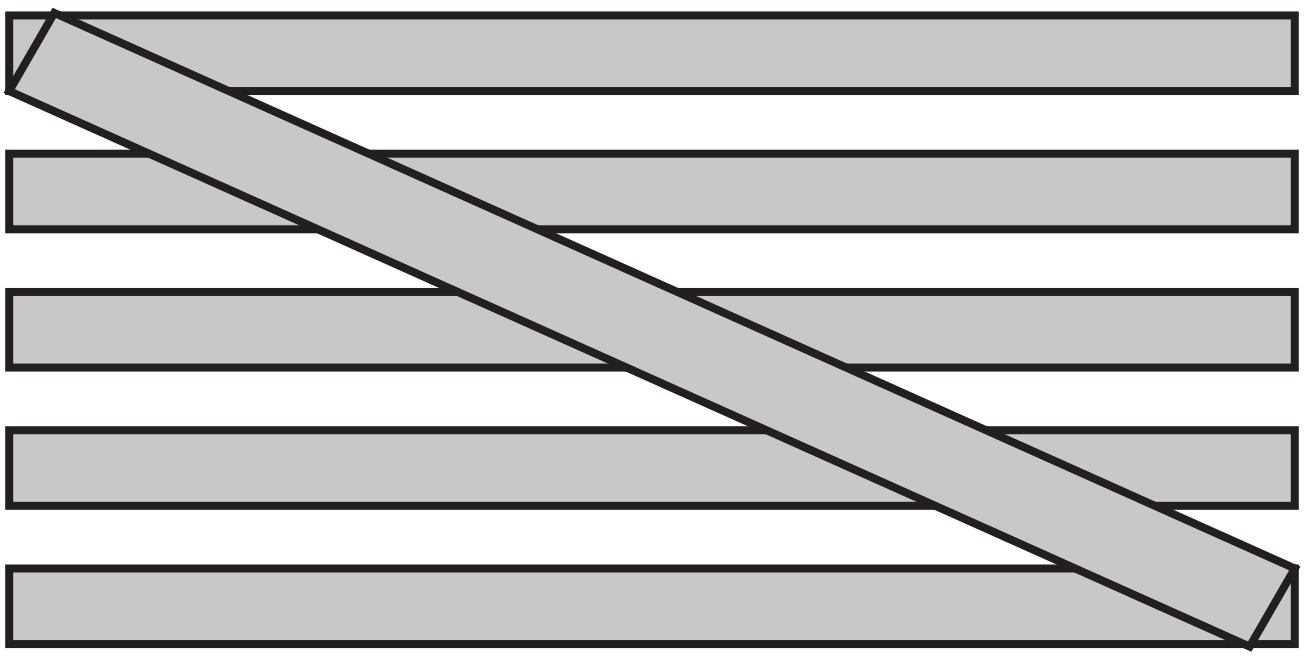
Question 12

Diagram 1

Diagram NOT drawn to scale

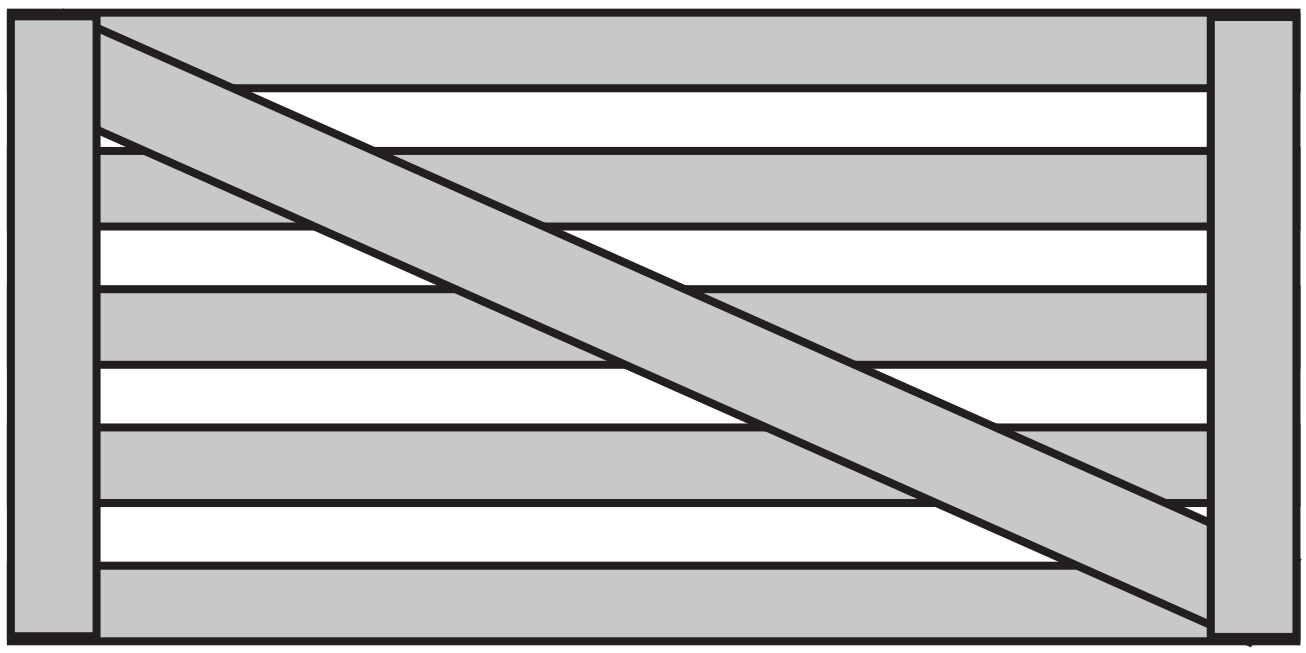
Diagram 2

Diagram NOT drawn to scale



Question 12 (b)

Diagram NOT drawn to scale



GCSE

3310U40-1

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

THURSDAY, 7 NOVEMBER 2019 – MORNING

Spare Diagram Booklet

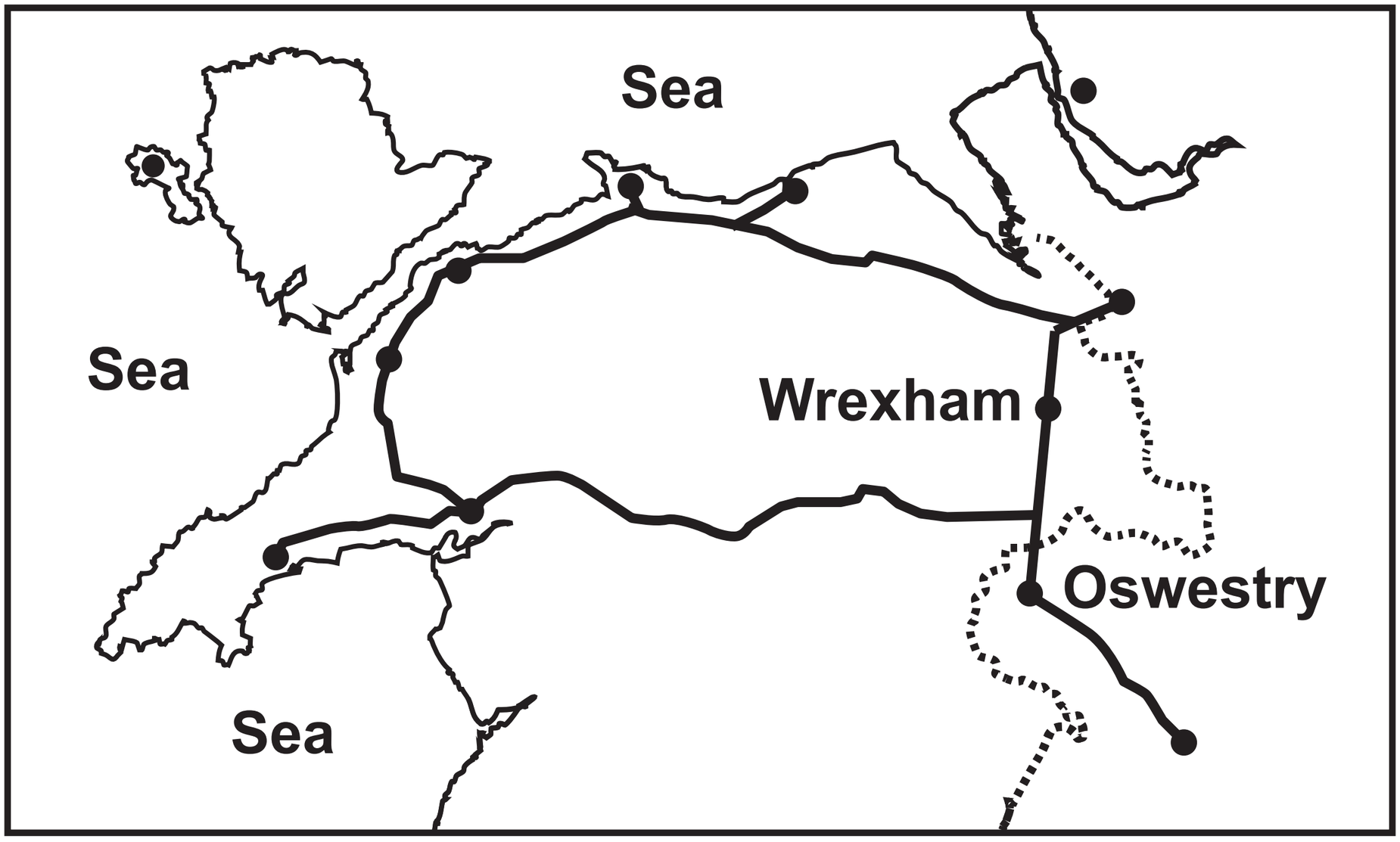
Surname:	
First name(s):	
Centre Number:	
Candidate Number:	**0**

Question 2

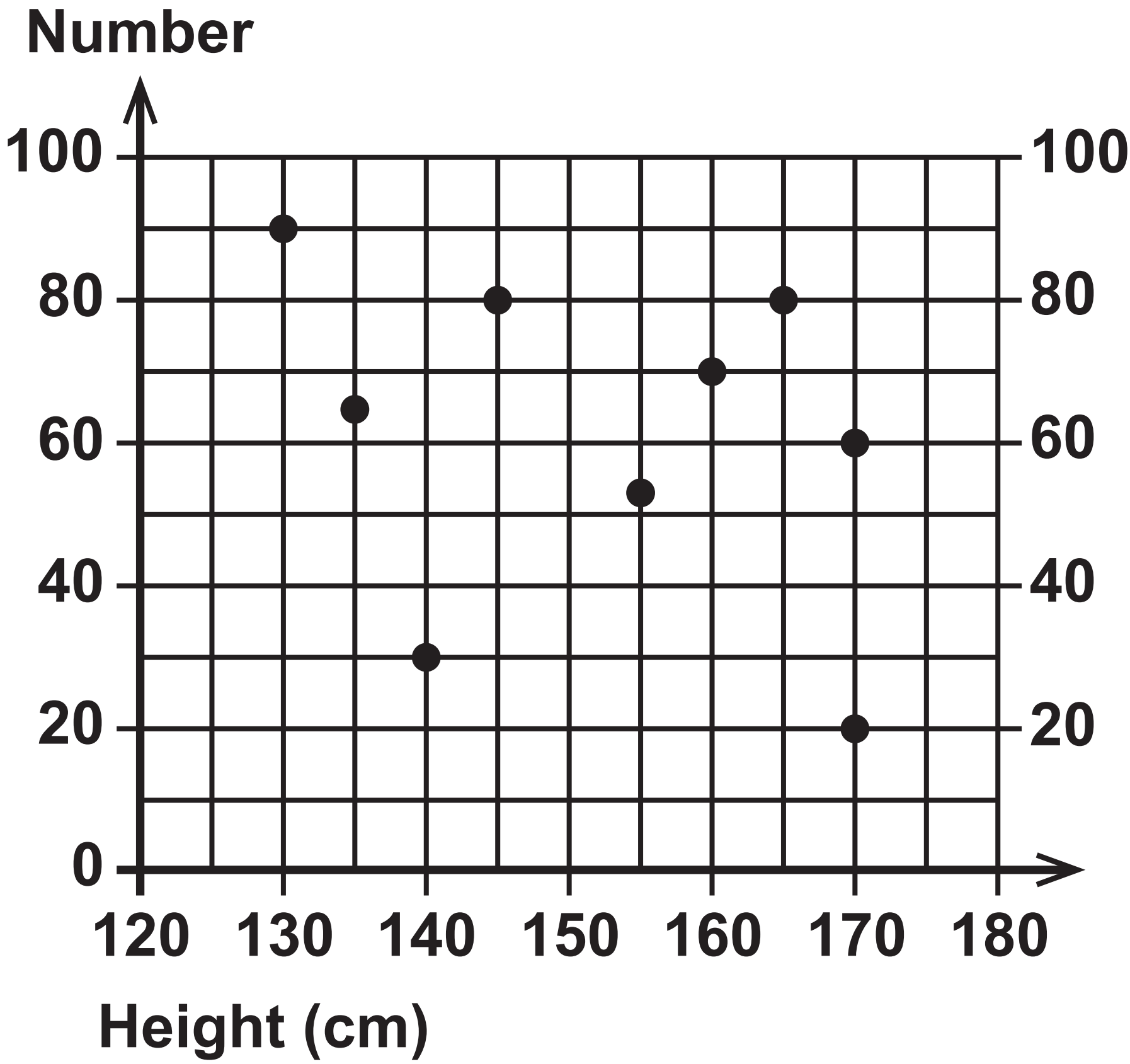
Table

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 5



Question 6



Question 6 (b)

Table

Name	Height (cm)	Number
Gwenda		
Daniel		
Lotte		
Iona		
Steffan		

Question 7

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

Question 8 (a)

New Zealand postage stamps

1 New Zealand dollar ($1) = 100 cents (100c)

10c New Zealand	30c New Zealand	40c New Zealand

$1.60 New Zealand	$1.80 New Zealand	$2.30 New Zealand	$2.80 New Zealand

Question 9 (a)

Diagram X

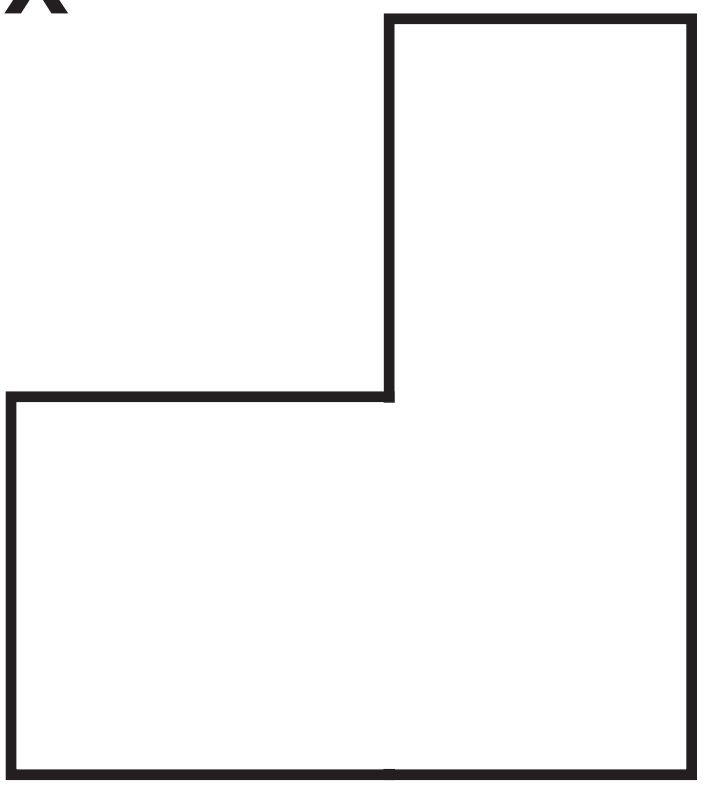
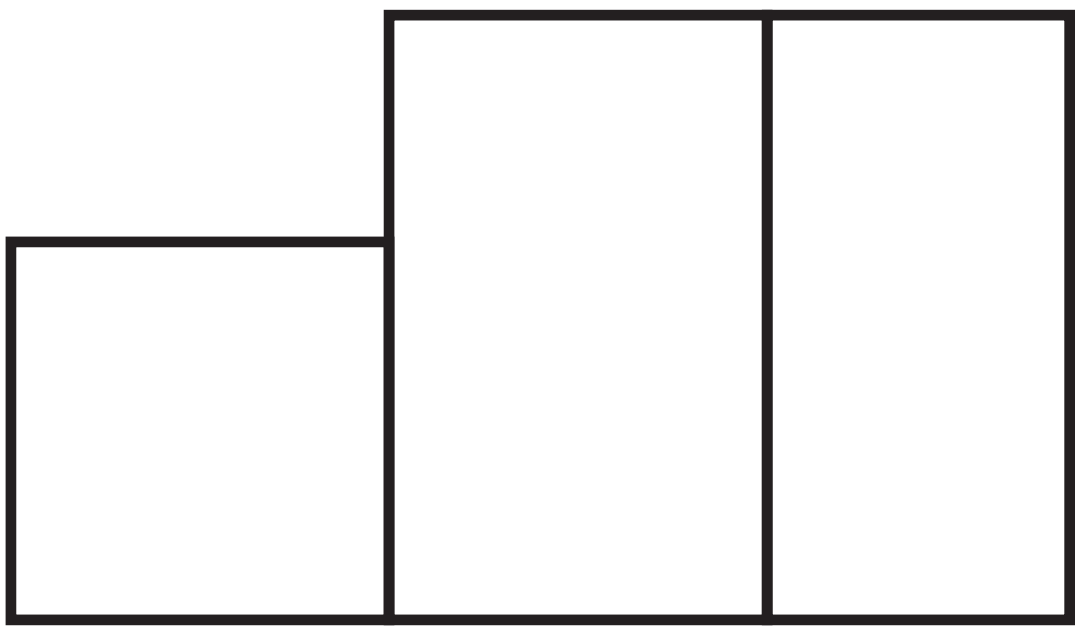


Diagram Y

Diagram Z



Question 11 (b)

Table

	Finbar's skateboard	Sab's skateboard
Area of the skateboard deck	1800 cm^2	1600 cm^2
Thickness of the skateboard deck	1•2 cm	1•4 cm
Material used to make the deck	Fibreglass	Maple wood

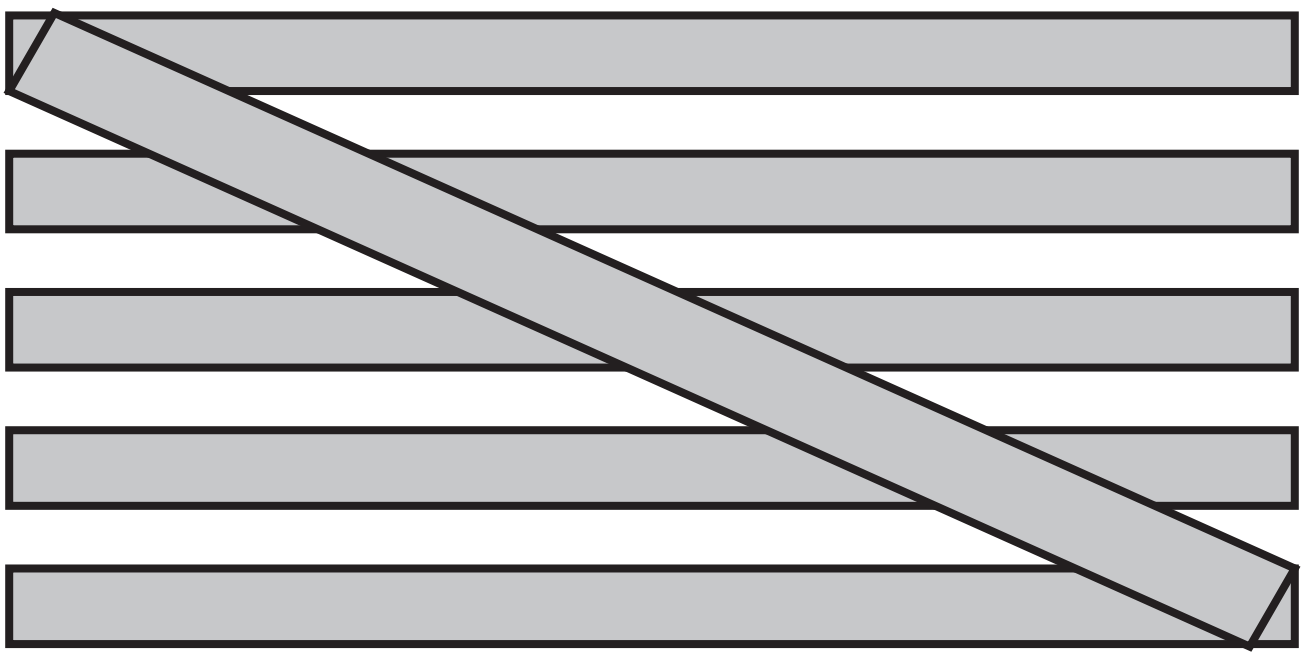
Question 12

Diagram 1

Diagram NOT drawn to scale

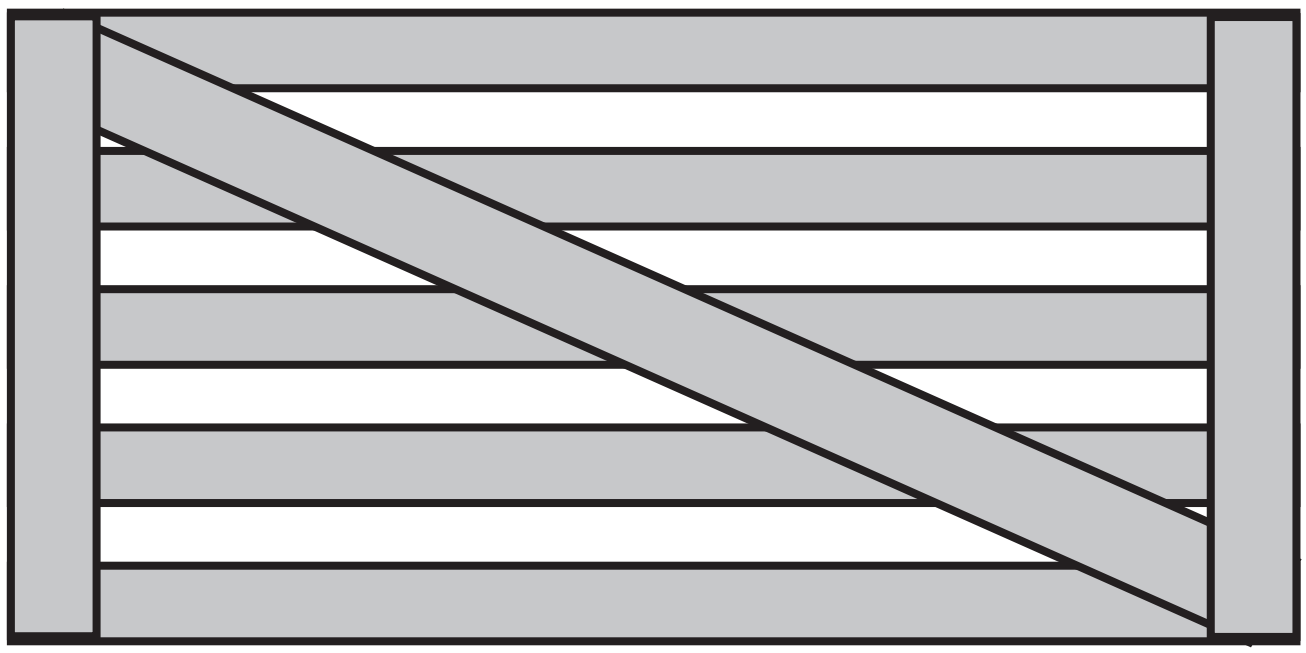
Diagram 2

Diagram NOT drawn to scale



Question 12 (b)

Diagram NOT drawn to scale



GCSE
MATHEMATICS
and
NUMERACY

wjec
cbac

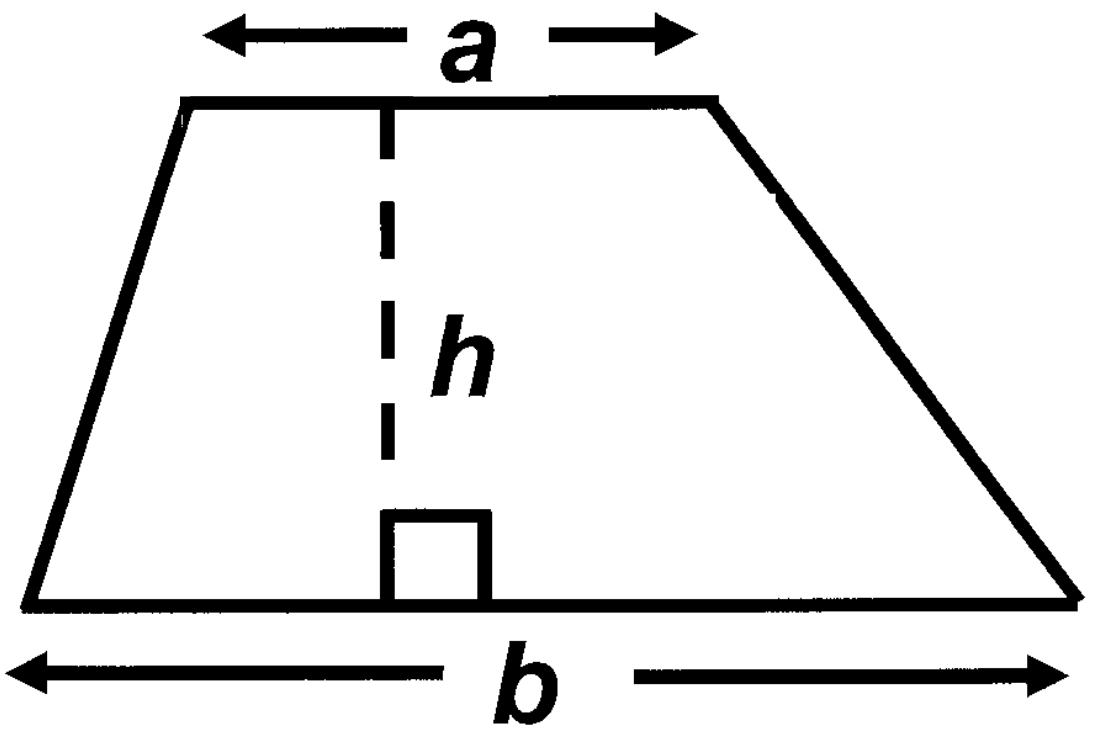
FORMULA LIST
INTERMEDIATE TIER
GCSE

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