

Surname	Centre Number	Candidate Number
First name(s)		0



**GCSE**

3310U40-1



A19-3310U40-1

**THURSDAY, 7 NOVEMBER 2019 – MORNING**

**MATHEMATICS – NUMERACY  
UNIT 2: CALCULATOR-ALLOWED  
INTERMEDIATE TIER**

1 hour 45 minutes

**ADDITIONAL MATERIALS**

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the additional page at the back of the booklet. Question numbers must be given for all work written on the additional page.

Take  $\pi$  as 3.14 or use the  $\pi$  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 7(a), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

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	
<b>Total</b>	<b>80</b>	

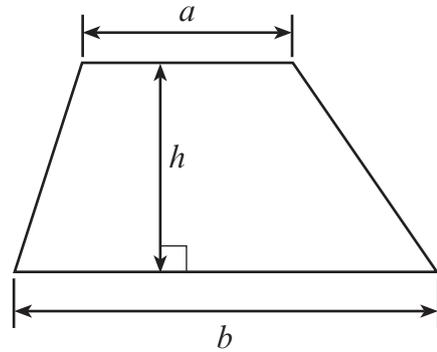
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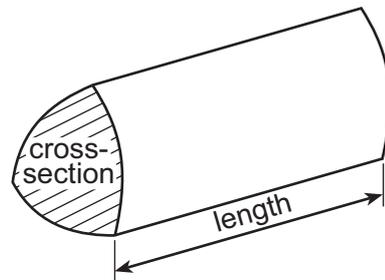
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## Formula List – Intermediate Tier

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



**Volume of prism** = area of cross-section  $\times$  length





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



The table below 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]

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

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- (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.

[1]

4 bottles      28.5 bottles      10.5 bottles      36 bottles      38 bottles

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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]

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- (ii) What fraction of Jenna's friends have a dog? [2]

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- (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]

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5. A map of north Wales and the border with England is shown below. The distance between Wrexham and Oswestry is approximately 22 km by road.



- (a) The straight-line distance between Wrexham and Oswestry on the map is 2.2 cm. Which of the following represents the scale of the map? Circle your answer. [1]

1 : 10      1 : 1000      1 : 10000      1 : 100000      1 : 1000000

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- (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. [3]

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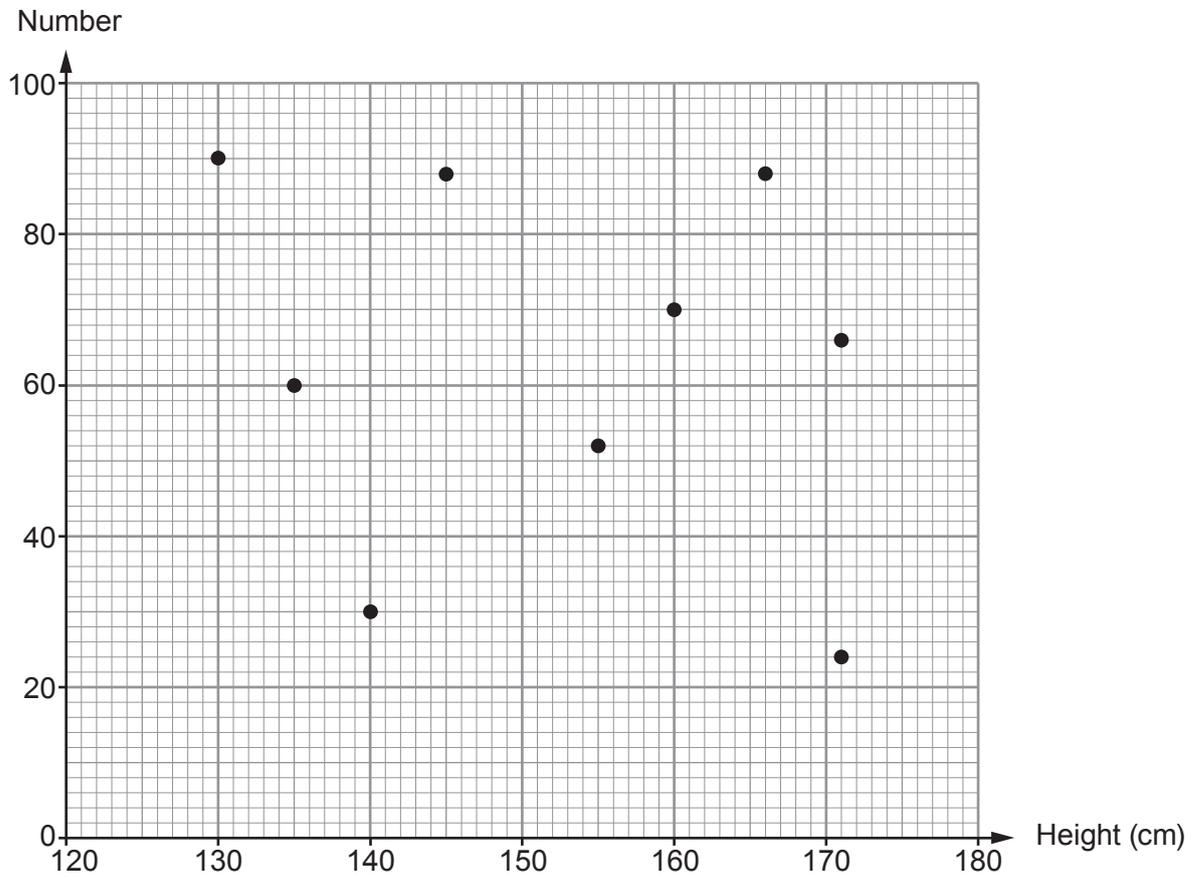
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Average speed ..... km/h



6. 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 below.



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

[1]

- (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.

[4]

Name	Height (cm)	Number
Gwenda		
Daniel		
Lotte		
Iona		
Steffan		





8. (a) Rowan lives in New Zealand.

Rowan wants to post a number of packages.  
He has 10 of each of the following stamps.



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

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.

(i) Documents, postage \$3.60

[2]

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(ii) Birthday present, postage \$7.40

[2]

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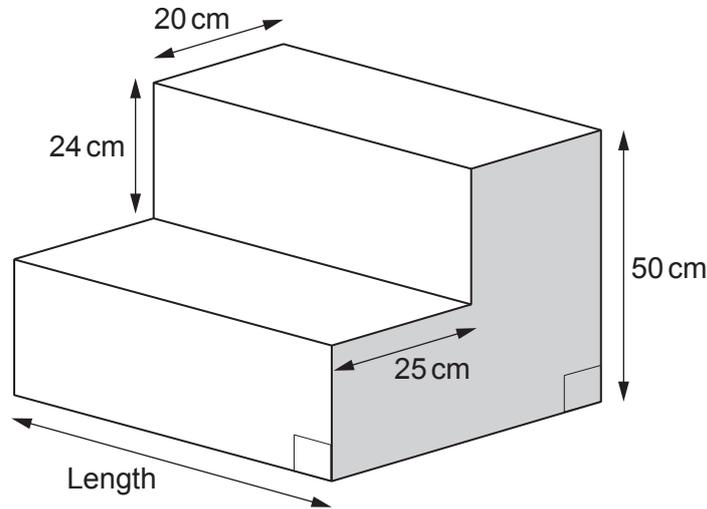
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9. The picture shows a solid concrete step.  
The step:

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



*Diagram not drawn to scale*

(a) Draw a sketch of the plan view of the concrete step. [1]

(b) The volume of concrete in the step is  $66\,000\text{ cm}^3$ .

(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.)

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

There were no other costs.

Calculate the total cost of making the step. [3]

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(ii) Calculate the length of the step.  
Give your answer in cm.  
You must show all your working.

[5]





- (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]

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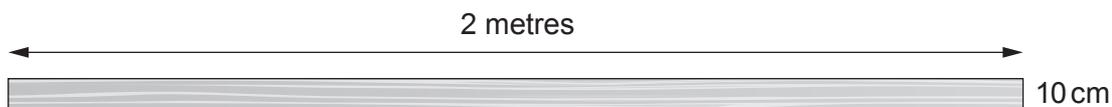
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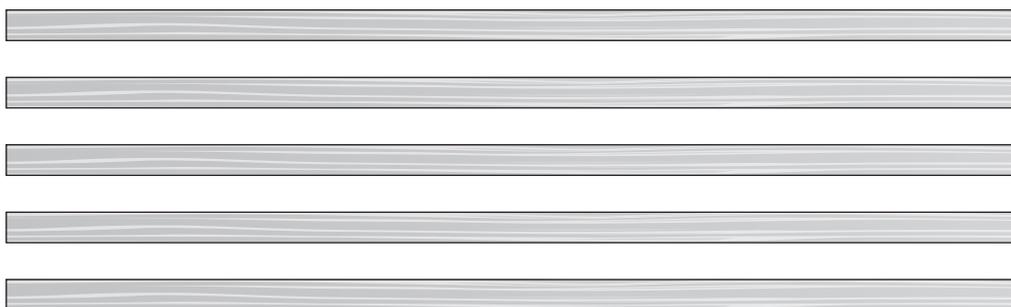


12. Robyn has 5 planks of wood each of length 2 m and width 10 cm.



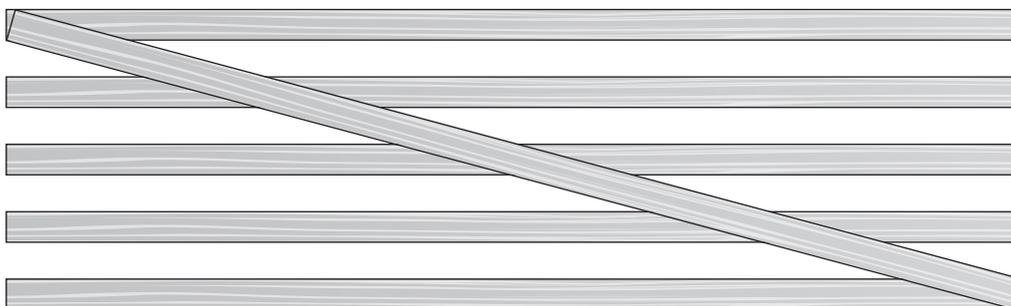
*Diagram not drawn to scale*

She lays the 5 planks horizontally on the floor. She leaves a **15 cm gap** between each plank, as shown below.



*Diagram 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 below.



*Diagram not drawn to scale*

- (a) (i) Calculate an estimate of the length of the plank that is to be placed diagonally. Give your answer in metres. [4]

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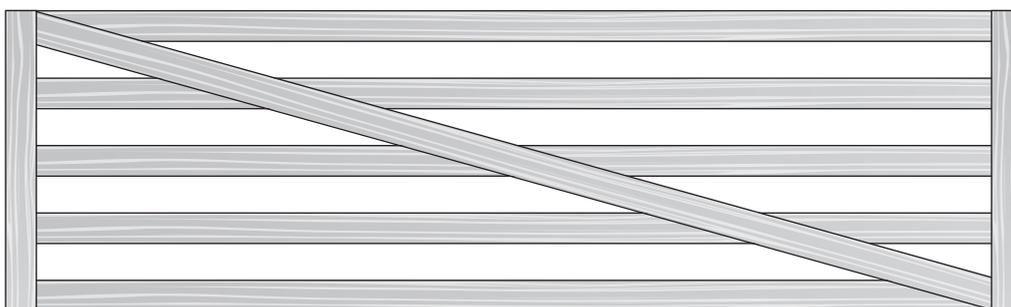
- (ii) What assumption did you make in calculating the length of the plank that is to be placed diagonally? [1]

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- (b) Robyn finishes the gate with two end planks of wood.



*Diagram not drawn to scale*

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

cost of 1 horizontal plank : cost of 1 diagonal plank : cost of 1 end plank

$$= 3 : 4 : 5$$

An end plank costs £8.55.

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

[4]

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**END OF PAPER**



