

# WJEC GCSE Mathematics and Numeracy (Double Award)

Approved by Qualifications Wales

## Sample Assessment Materials

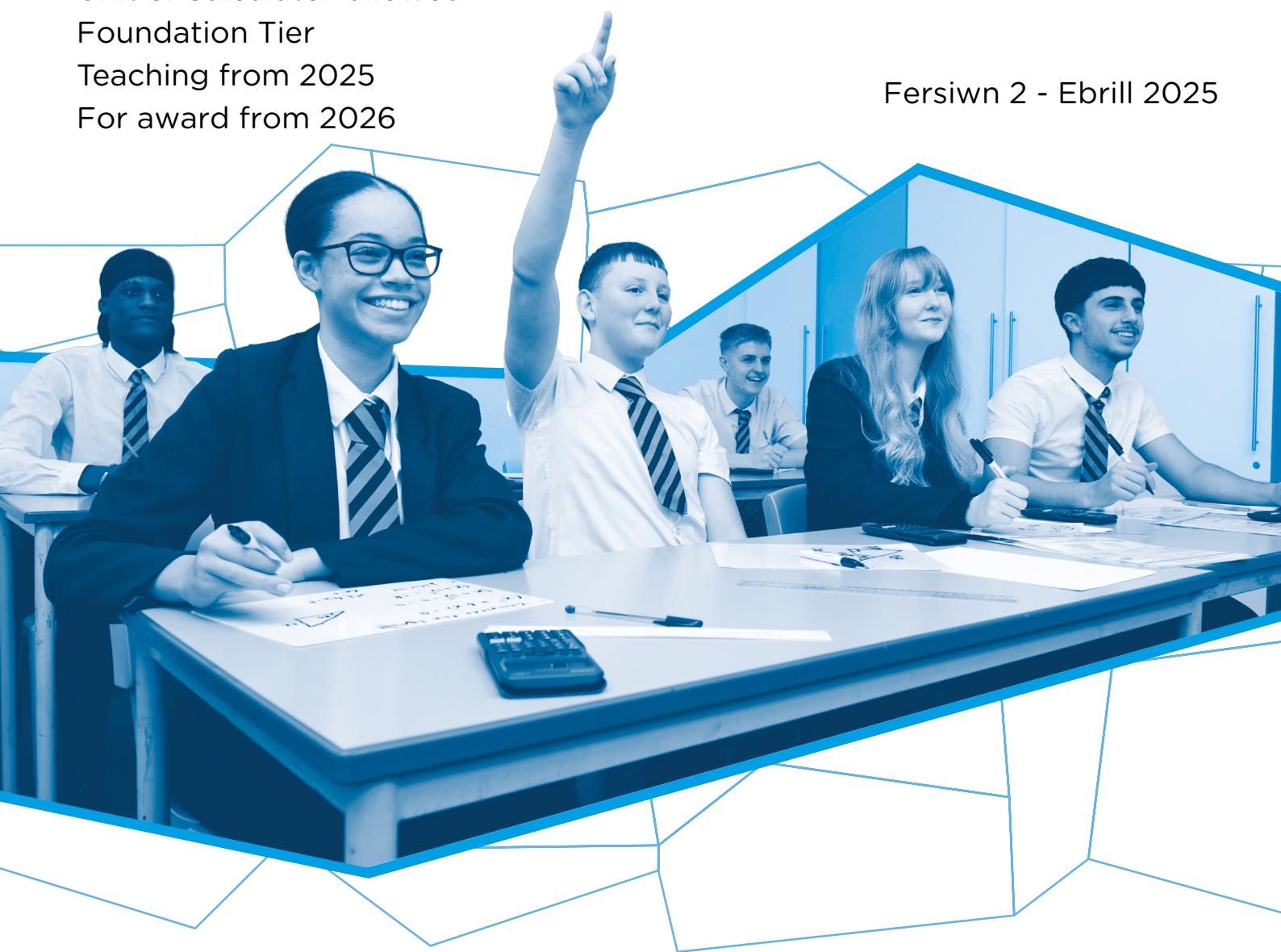
Unit 3: Calculator-allowed

Foundation Tier

Teaching from 2025

For award from 2026

Fersiwn 2 - Ebrill 2025





# SUMMARY OF AMENDMENTS

Version	Description	Page number
2	Graphics updated	19

## Contents

Question paper	1
Mark scheme	26
Mapping grid	34

Surname	Centre number	Candidate number
First name(s)		0



**GCSE**

**3320U3**

**Mathematics and Numeracy  
(Double Award)  
Unit 3: Calculator-allowed  
Foundation Tier**

**1 hour 45 minutes**

**SAMPLE ASSESSMENT  
MATERIALS**

**Additional materials**

The use of a calculator will be required for this examination.

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 provided at the top of this page.

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

If you need more space, use the additional page(s) at the back of this booklet. Number the question(s) correctly.

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

**Information for candidates**

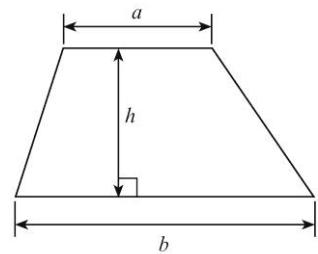
The number of marks is given in brackets at the end of each question or part-question.

In question 2(a), the assessment will take into account the quality of your mathematical organisation, communication and accuracy in writing.

<b>For examiner's use only</b>		
<b>Question</b>	<b>Maximum mark</b>	<b>Mark awarded</b>
1.	2	
2.	8	
3.	2	
4.	3	
5.	9	
6.	3	
7.	2	
8.	4	
9.	6	
10.	2	
11.	4	
12.	5	
13.	3	
14.	4	
15.	6	
16.	5	
17.	3	
18.	4	
<b>Total</b>	<b>75</b>	

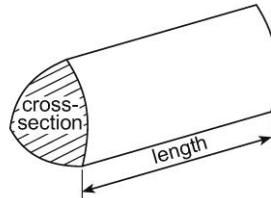
## Formula List – Unit 3 Foundation Tier

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



**Volume of an Object with a Uniform Cross-section  
(e.g. Prism, Cylinder)**

$$\text{Volume} = \text{area of cross section} \times \text{length}$$



Answer **all** questions.

1. (a) The words of the Welsh national anthem, Hen Wlad fy Nhadau, were written by Evan James in January 1856.  
In January 2024, Mathew sang the anthem in a school competition.

[1]  
Examiner only

How many years after Evan James wrote the words did Mathew sing in the competition?

.....  
.....

(b) Kris has correctly answered four out of the five calculations shown below.  
Circle the **incorrect** calculation.

$$54 + 9876 = 9930$$

$$123 \times 87 = 10701$$

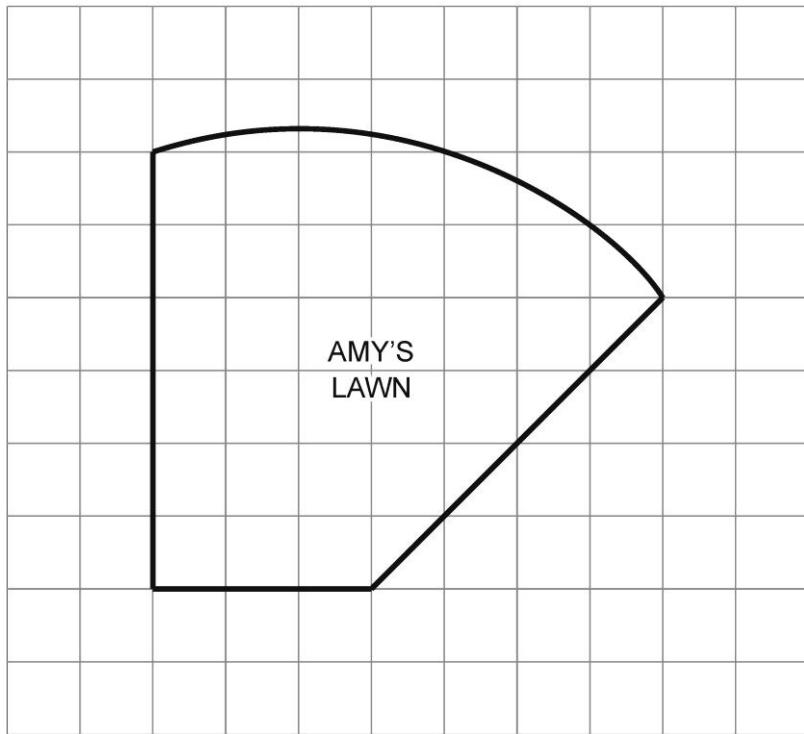
$$1225 \div 35 = 35$$

$$246 \times 35 = 8650$$

$$12345 - 6789 = 5556$$

.....  
.....

2. The shape below, drawn on a square grid, represents the lawn in Amy's garden. [3 + 2 OCW]



(a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Each square on the grid represents an area of  $2.25 \text{ m}^2$ .  
Estimate the area of Amy's lawn.

(b) Amy wants to improve her lawn by sowing new grass seeds.  
Grass seed to cover 1 m<sup>2</sup> costs 94p.

[3]

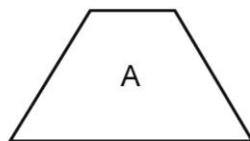
Examiner  
only

Calculate the total cost of the seeds that Amy needs.  
Give your answer in **pounds** (£), correct to the nearest penny.

.....  
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Total cost of the grass seeds = £.....

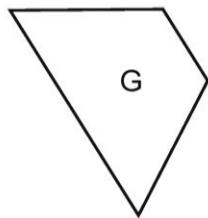
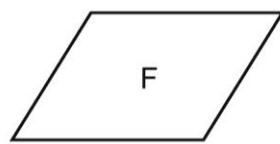
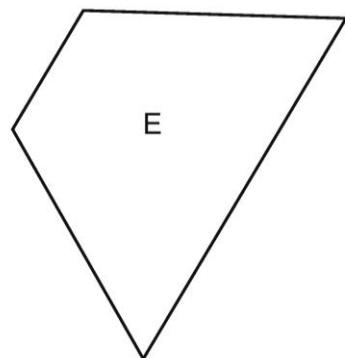
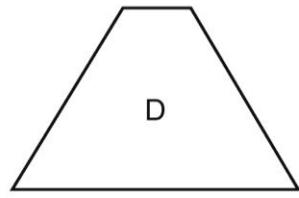
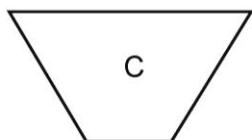
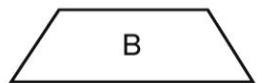

3.



[2]

Examiner  
only

Which **two** of the following shapes are congruent to shape A?



The shapes which are congruent to shape A are:

..... and .....

4. Clara is making cheese sandwiches, ham sandwiches and tuna sandwiches to sell in her shop. [3]

Examiner only

She makes a total of 180 sandwiches.

Use the following information to complete the table below.

- 124 sandwiches are made using brown bread
- 85 sandwiches contain cheese
- 18 tuna sandwiches are made with white bread
- 28 of the 40 ham sandwiches are made with brown bread.

	Cheese	Ham	Tuna	Total
White bread				
Brown bread				
Total				<b>180</b>

.....

.....

.....

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.....


5. The 32 pupils in a Year 11 class were asked to record their main method of travel to school on that day.

Examiner only

The options they recorded were Walking, Cycling, Bus, Train, Car, Other.

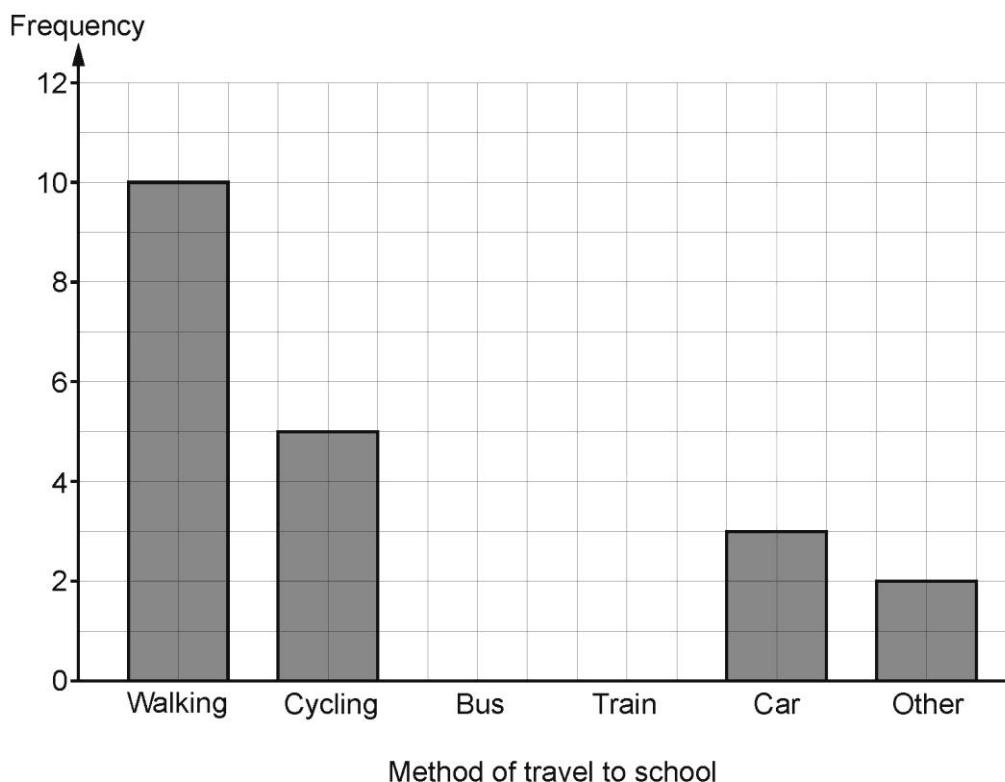
(a) Some of the results are shown in the bar chart below.

[2]

From the 32 pupils in the class:

- 12 pupils recorded either Bus or Train
- the **modal** option was Bus.

Complete the bar chart by drawing the two missing bars.



(b) Seven of the students who had walked were asked to record their distances from home to school on that day.

The distances, measured in km, are shown below.

2.1      1.7      0.9      1.4      2.1      2.8      0.2

(i) Find the median of these distances.

[2]

.....  
.....  
.....  
.....

Median = ..... km

(ii) Find the range of these distances.

[1]

.....  
.....

Range = ..... km

(iii) Find the mean of these distances.

[3]

You must show all your working.

.....  
.....  
.....  
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.....

Mean = ..... km

(iv) An eighth walking student stated that she walked 0.4 km to school each day.

[1] Examiner only

What will happen to the mean distance calculated in part (iii) if all eight students are included?

Tick the correct box.

The mean will increase	<input type="checkbox"/>
The mean will stay the same	<input type="checkbox"/>
The mean will decrease	<input type="checkbox"/>

You must explain your choice.

.....  
.....

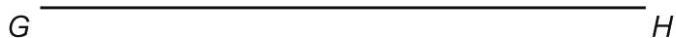
  

6. Using a ruler and protractor, complete an accurate drawing of the triangle  $FGH$ , in which:

[3]

- $GH = 8\text{ cm}$
- $F\hat{G}H = 60^\circ$
- $F\hat{H}G = 36^\circ$

The side  $GH$  has been drawn for you.



7. Sam thinks of a number.

[2]

Examiner  
only

$\frac{1}{3}$  of his number is 477.

What is Sam's number?

.....  
.....  
.....  
.....

8. (a) (i) A box contains  $a$  apples.

Write down, in terms of  $a$ , the number of apples in 8 boxes.

[1]

.....  
.....

[1]

(ii) Yang is  $b$  years old. Catrin is 7 years younger than Yang.  
Write down Catrin's age, in terms of  $b$ .

.....  
.....

[1]

(b) (i) Solve  $x - 7 = 38$

.....  
.....

[1]

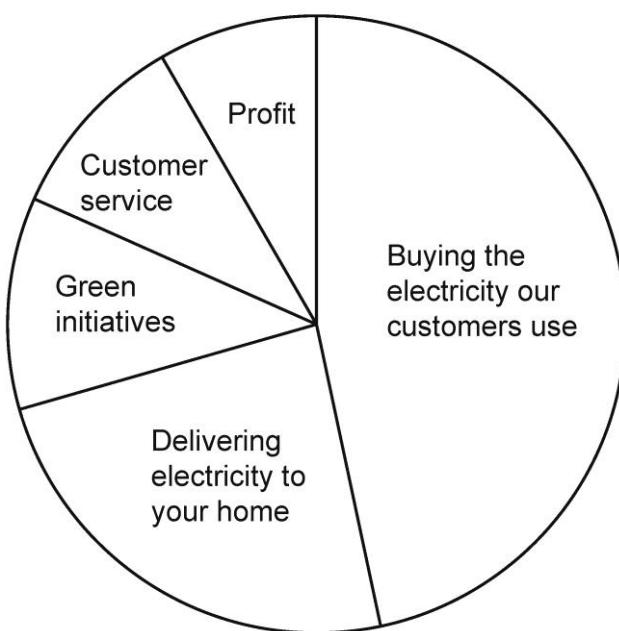
(ii) Solve  $\frac{y}{4} = -17$

.....  
.....

9. Gwalia Electric is a company that supplies electricity.

(a) Last year, Gwalia Electric displayed the following information in a pie chart.

[3]



The pie chart represents a total of £2340 million.

How much money did Gwalia Electric spend on green initiatives last year?  
Give your answer in millions of pounds.

.....  
.....  
.....  
.....  
.....  
.....  
.....

Money spent on green initiatives = £ ..... million

(b) Last year, Gwalia Electric had 1.08 million customers.  
The previous year, Gwalia Electric had 800 000 customers.

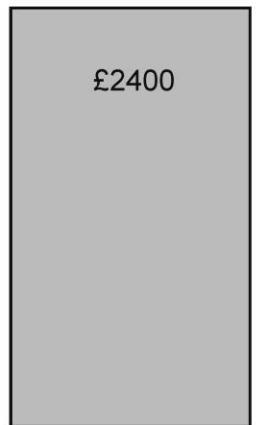
[1] Examiner only

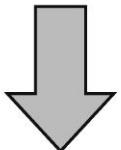
What is the difference between these numbers of customers?  
Circle your answer.

1 880 000      280 000      692 000      2 800 000      728 920

.....  
.....

(c) In an advertisement, Gwalia Electric claims that the average annual household bill has decreased by 9% during the last year. [2]  
The advertisement contains the following display.



Down 9%  


Is the decrease of 9% correct for the displayed numbers?  
You must show all your working to support your answer.

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.....  
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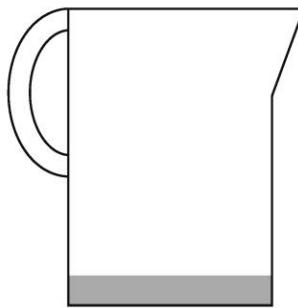
10. Calculate the following, giving your answer correct to 2 decimal places.

[2] Examiner only

$$\frac{25 - 3.7^2}{\sqrt{21}}$$

.....  
.....  
.....  
.....


11. A lemon drink is to be made by adding water to lemon cordial.



(a) A measuring jug contains 170 ml of lemon cordial.  
1.36 litres of water is added to make the lemon drink.

[2]

What is the volume of lemon drink in the jug?  
Give your answer in millilitres.

.....  
.....  
.....  
.....

The volume of lemon drink in the jug is ..... ml

(b) A cup holds 175 ml of lemon drink when full.

[2]

Examiner  
only

How many cups can be completely filled by using the lemon drink from the jug?

.....  
.....  
.....  
.....


12. In a quiz, there are 60 questions.

A contestant scores

- + 6 points for each correct answer,
- 3 points for each incorrect answer,
- 2 points for each question not answered.

Elena and Faizal are two contestants in the quiz.

(a) Elena answers 32 questions correctly, answers 16 questions incorrectly and does not answer 12 questions.

What is her final score?

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(b) After 59 questions, Faizal's score was 345 points.  
After 60 questions, Faizal's score was 343 points.

[3]

Explain, showing your calculations, how Faizal may have answered the 60 questions.

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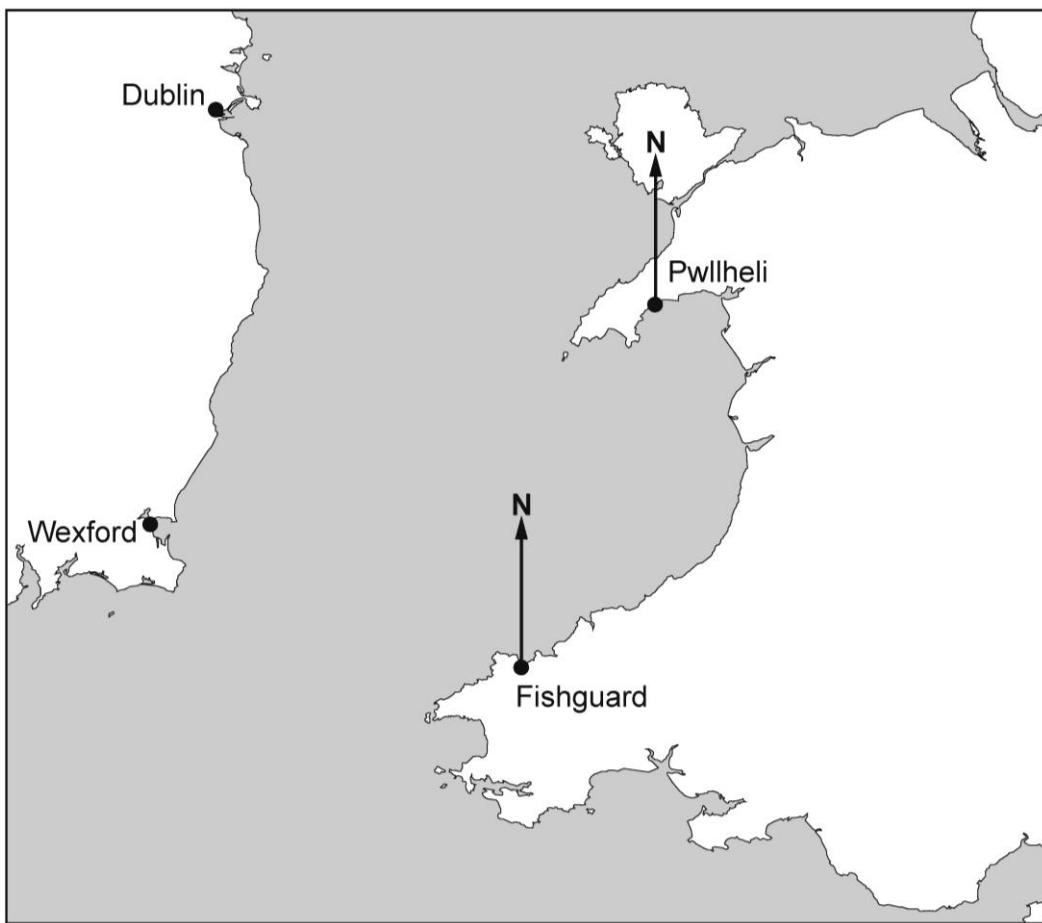
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13. A map of Wales and part of the Republic of Ireland is shown below.

[3]

Examiner  
only



The village of Courtown in the Republic of Ireland is on a bearing of:

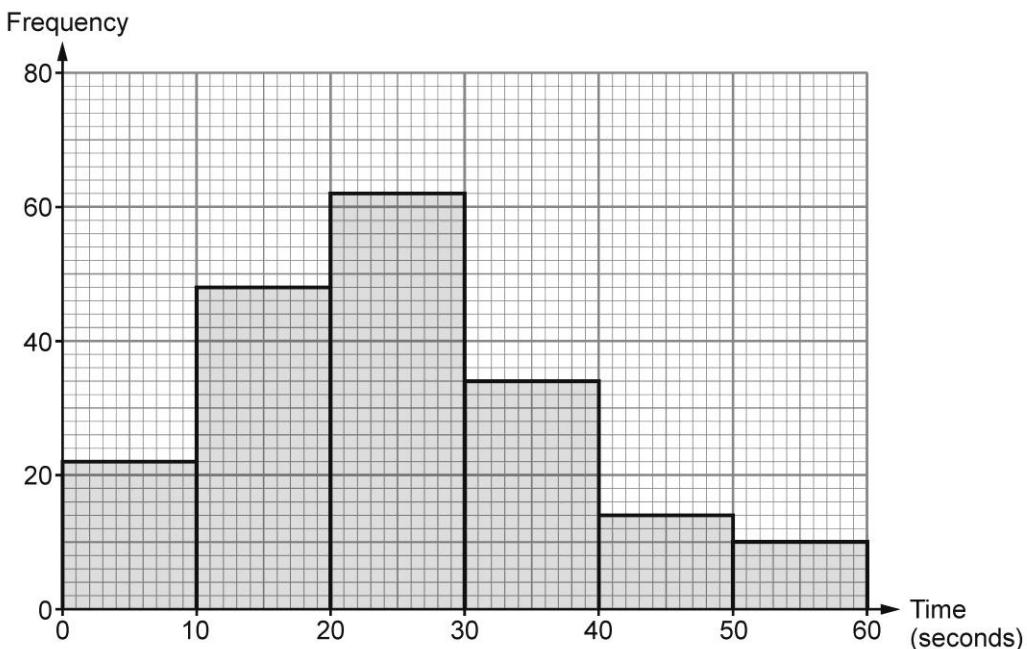
- $260^\circ$  from Pwllheli and
- $310^\circ$  from Fishguard.

Mark the position of Courtown on the map with a cross, X.

**14.** Mali works in a call centre.

The frequency diagram below shows the time it took Mali to answer each call she received on Tuesday.

On Tuesday, she answered all the calls within 60 seconds.



Mali said,

'I answered 80% of the calls received on Tuesday within 30 seconds or less.'

Is Mali correct?

Yes

No

You must show working to support your answer.

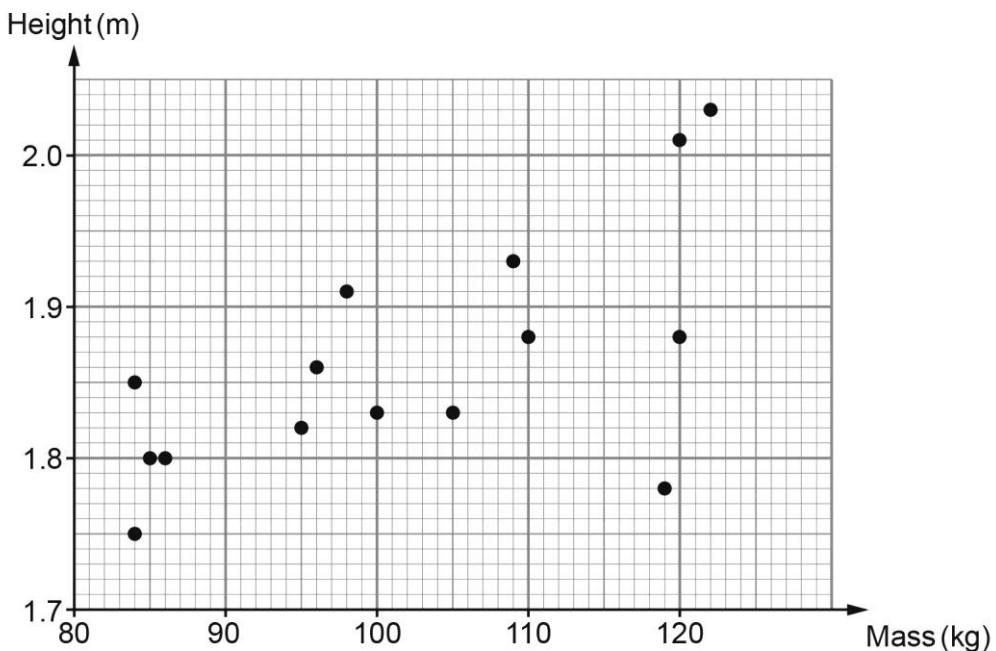
[4]

15. A rugby team consists of 15 players.

The Welsh rugby team played the Irish rugby team in February 2024.

Examiner  
only

The scatter diagram below shows the height and mass of each of the 15 Welsh players who started the game against Ireland.



(a) Two of the players, each with a mass greater than 90 kg, have the same mass. [2]

Find the difference between the heights of these two players.  
Give your answer in centimetres.

.....  
.....  
.....  
.....

(b) Siôn believes the scatter diagram shows that there is a positive correlation between the height and mass of the 15 Welsh players.

(i) Explain what this means in the context of the scatter diagram. [1]

.....  
.....

(ii) Sion's friend, Harri, looks at the scatter diagram and says;

'One player's height and mass don't follow the same pattern as for the rest of the players'.

Write the height and mass of this player.

Examiner  
only

[1]

Height = ..... m      Mass = ..... kg

(c) Draw a line of best fit on the scatter diagram.

[1]

(d) Explain why it may not be appropriate to use your line of best fit to estimate the height of a rugby player with mass 125 kg.

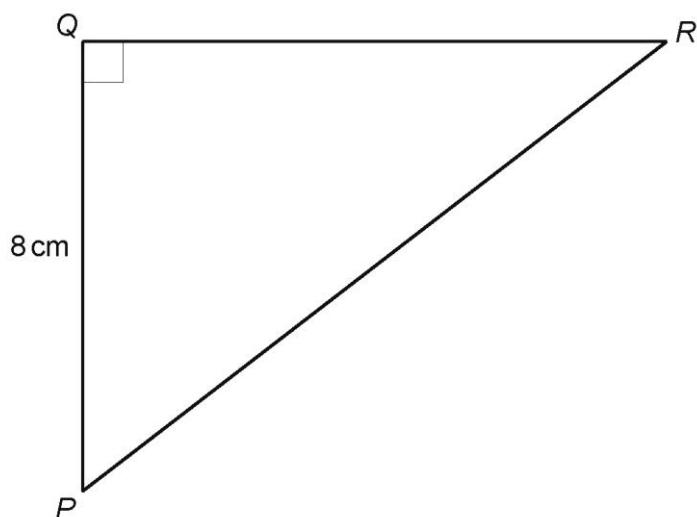
[1]

.....

.....

16. The area of triangle  $PQR$ , shown in the diagram below, is  $36 \text{ cm}^2$ .

[5] Examiner only



*Diagram not drawn to scale*

Calculate the length of  $PR$ .



17. The scale diagram below shows a plan view of Gruff's garden.  
The scale used is **1 cm represents 1 metre**.

[3]  
Examiner  
only

Gruff's house is along the side BC.

There is a hedge along AB.

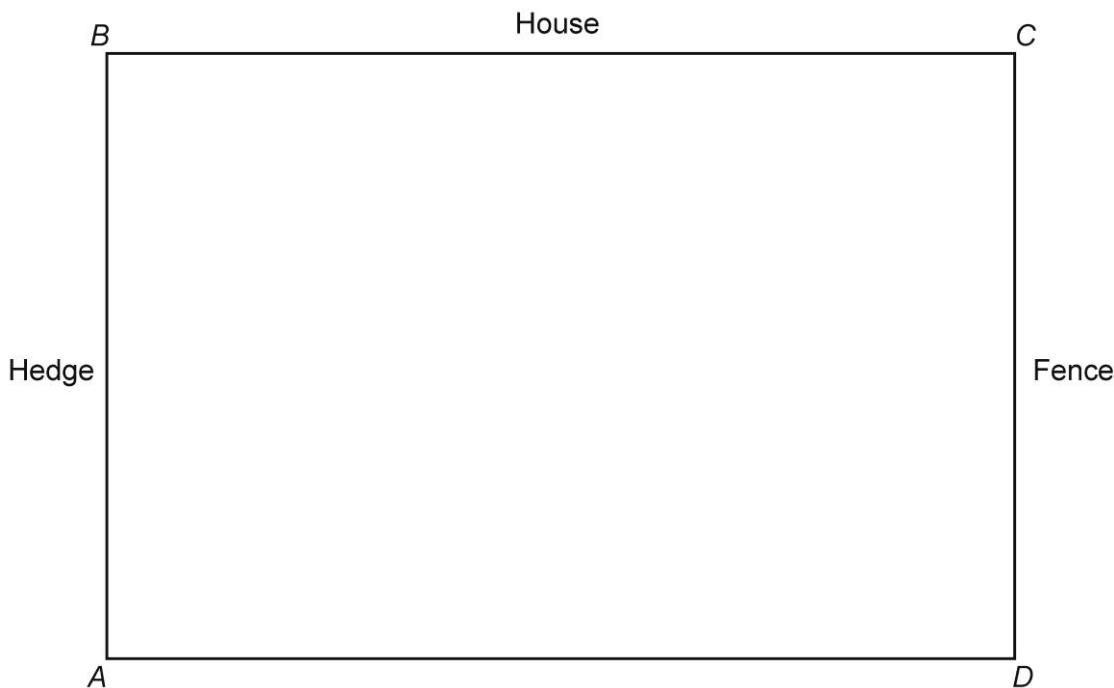
There is a fence along CD.

Gruff wants to plant a tree in the garden.

The tree must be

- nearer to the fence than the house
- less than 7 metres from the corner A.

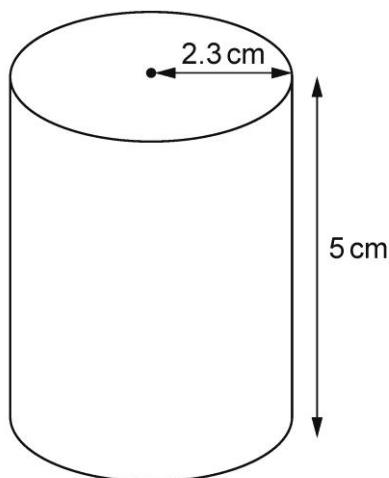
Draw suitable lines on the diagram and shade the region where the tree could be planted.



18. A solid metal cylinder has a radius of 2.3 cm and a height of 5 cm.

[4]

Examiner  
only



*Diagram not drawn to scale*

The mass of the cylinder is 423.1 g.

Find the density of the metal.

Give your answer in g/cm<sup>3</sup>.

END OF QUESTIONS

Question number	<p style="text-align: center;"><b>Additional page, if required. Write the question number(s) in the left-hand margin.</b></p>



## Mark Scheme

GCSE Mathematics and Numeracy Unit 3 Foundation Tier SAMs	Mark	Comments
1.(a) $(2024 - 1856 =) 168$ (years)	B1	
1.(b) $246 \times 35 = 8650$	B1	
2. (a) Evidence of square counting (Number of squares =) 33 (Total area = $33 \times 2.25 =) 74(.25$ ) ( $\text{m}^2$ )	M1 A1 B1	Allow 31 to 35 squares. Allow 69.75 to 78.75 ( $\text{m}^2$ ). FT $2.25 \times$ 'their area'.
Organisation and Communication.	OC1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> <li>present their response in a structured way</li> <li>explain to the reader what they are doing at each step of their response</li> <li>lay out their explanation and working in a clear and logical way</li> <li>write a conclusion that draws together their results and explains what their answer means</li> </ul>
Accuracy of writing.	W1	For W1, candidates will be expected to: <ul style="list-style-type: none"> <li>show all their working</li> <li>use correct mathematical form in their working</li> <li>use appropriate terminology, units, etc</li> </ul>
(b) $74.25 \times 0.94$ or $74.25 \times 94$  (£) 69.80	M1  A2	FT 'their area' $\times$ 0.94 or 'their area' $\times$ 94. Allow use of 'their area' rounded to nearest whole or rounded to 1 d.p. For reference: <ul style="list-style-type: none"> <li><math>69.75 \times 0.94 = 65.56(5)</math></li> <li><math>78.75 \times 0.94 = 74.02(5)</math></li> </ul> Award A1 for one of the following: <ul style="list-style-type: none"> <li>an equivalent answer in pence (correct to the nearest penny)</li> <li>an answer correctly given in pounds, but not correctly rounded e.g. £69.79 or £70.</li> </ul>
3. C (and) G	B2	B1 for at least one correct answer and no more than one incorrect answer.

<p>4. Completed table:</p> <table border="1" data-bbox="96 226 711 377"> <thead> <tr> <th></th><th>Cheese</th><th>Ham</th><th>Tuna</th><th>Total</th></tr> </thead> <tbody> <tr> <td>White bread</td><td>26</td><td>12</td><td><b>18</b></td><td>56</td></tr> <tr> <td>Brown bread</td><td>59</td><td><b>28</b></td><td>37</td><td><b>124</b></td></tr> <tr> <td>Total</td><td><b>85</b></td><td><b>40</b></td><td>55</td><td>(180)</td></tr> </tbody> </table> <table border="1" data-bbox="96 444 711 595"> <thead> <tr> <th></th><th>Cheese</th><th>Ham</th><th>Tuna</th><th>Total</th></tr> </thead> <tbody> <tr> <td>White bread</td><td></td><td></td><td><b>18</b></td><td></td></tr> <tr> <td>Brown bread</td><td></td><td><b>28</b></td><td></td><td><b>124</b></td></tr> <tr> <td>Total</td><td><b>85</b></td><td><b>40</b></td><td></td><td>(180)</td></tr> </tbody> </table> <table border="1" data-bbox="96 662 711 813"> <thead> <tr> <th></th><th>Cheese</th><th>Ham</th><th>Tuna</th><th>Total</th></tr> </thead> <tbody> <tr> <td>White bread</td><td></td><td>a</td><td><b>18</b></td><td>b</td></tr> <tr> <td>Brown bread</td><td></td><td><b>28</b></td><td></td><td><b>124</b></td></tr> <tr> <td>Total</td><td><b>85</b></td><td><b>40</b></td><td>c</td><td>(180)</td></tr> </tbody> </table>		Cheese	Ham	Tuna	Total	White bread	26	12	<b>18</b>	56	Brown bread	59	<b>28</b>	37	<b>124</b>	Total	<b>85</b>	<b>40</b>	55	(180)		Cheese	Ham	Tuna	Total	White bread			<b>18</b>		Brown bread		<b>28</b>		<b>124</b>	Total	<b>85</b>	<b>40</b>		(180)		Cheese	Ham	Tuna	Total	White bread		a	<b>18</b>	b	Brown bread		<b>28</b>		<b>124</b>	Total	<b>85</b>	<b>40</b>	c	(180)	<p>B3 Fully correct table.</p> <p>B2 for any 7 (or more) correct entries.</p> <p>B1 for 4 or 5 of the <b>bold</b> entries.</p> <p>If B1 awarded with one error, allow the following FT answers for a second B1 (awarding a total of B2 for 7 or 8 entries involving one error):</p> <ul style="list-style-type: none"> <li>• a = 'their 40' – 'their 28'</li> <li>• b = 180 – 'their 124'</li> <li>• c = 180 – 'their 85' – 'their 40'</li> </ul>
	Cheese	Ham	Tuna	Total																																																									
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<p>5.(a) Bars drawn correctly. Frequencies of 11 for Bus and 1 for Train.</p>	<p>B2 For B2, bars must be two squares wide. Condone inconsistent gaps between bars. B1 for one of the following:</p> <ul style="list-style-type: none"> <li>• any indication of 11 for Bus and 1 for Train</li> <li>• any indication of 12 for Bus and 0 for Train</li> </ul>																																																												
<p>5.(b)(i) 0.2 0.9 1.4 1.7 2.1 2.1 2.8 (Median =) 1.7 (km)</p>	<p>M1 A1 For arranging the 7 numbers in order. CAO Unsupported 1.7 gains M1 A1</p>																																																												
<p>5.(b)(ii) (Range =) 2.6 (km)</p>	<p>B1 B0 for 2.8 – 0.2 or 0.2 – 2.8</p>																																																												
<p>5.(b)(iii) 2.1 + 1.7 + 0.9 + 1.4 + 2.1 + 2.8 + 0.2 (= 11.2) ÷ 7 (Mean =) 1.6 (km)</p>	<p>M1 m1 A1 Attempt to add <u>all</u> 7 numbers. FT 'their total' CAO</p>																																																												
<p>5.(b)(iv) Indication that 'The mean will decrease' AND Valid reason e.g. 0.4 is less than the mean of 1.6; the new member is younger than the mean age.</p>	<p>E1 FT 'their derived mean' in part (b)(iii) provided at least M1 was awarded.  Allow E1 for a valid reason or explanation (e.g. calculating the new mean as <math>11.6/8 = 1.45</math>) without having given a conclusion in their table or in their explanation. E0 for 'because you are dividing by a larger number (8)'.</p>																																																												

6. Angle FGH Angle FHG Completed triangle	B1 B1 B1	Allow $\pm 2^\circ$ Allow $\pm 2^\circ$ Only if at least one angle correct.  Award B1 B1 B0 for one of the following: • a reflection of the completed correct triangle • a completed correct triangle drawn without using a ruler
7. $477 \times 3$ (Sam's number is) 1431	M1 A1	
8.(a)(i) $8a$	B1	
8.(a)(ii) $b - 7$	B1	
8.(b)(i) 45 (	B1	Accept an embedded answer.
8.(b)(ii) – 68	B1	Accept an embedded answer.
9.(a) Angle $40^\circ$ (or 11.1...%)  2340 (million) $\times 40 \div 360$ or equivalent (or 2340 (million) $\times 11.1\dots \div 100$ )  (£) 260 (million)	B1 M1 A1	Allow a tolerance of $\pm 2^\circ$ (or $\pm 0.55\dots\%$ )  FT for M1 only if the angle is out of tolerance but within $\pm 4^\circ$ (or equivalent working with percentage $\pm 1.11\dots\%$ ). M1 may imply B1. Allow a place value error from misinterpretation of 'million' i.e. 2340(0....) $\times 40 \div 360$ .  Mark final answer. Allow A1 for (£) 260 000 000 in answer space.
9.(b) 280 000	B1	
9.(c) Any one of: • $\frac{2400 - 2184}{2400} (\times 100 = 9\%)$ • $0.09 \times 2400 (= 216)$ • $0.91 \times 2400 (= 2184)$ • $100 \times 2184 \div [100 - 9] (= 2400)$ • $2184 \div 2400 (\times 100) (= 0.91 \text{ or } 91\%)$  'Yes' indicated or implied AND any one of: • $(\frac{2400 - 2184}{2400} \times 100 =) 9\%$ • $(2400 - 216 =) 2184$ OR $(2184 + 216 =) 2400$ • $(0.91 \times 2400 =) 2184$ • $(100 \times 2184 \div [100 - 9] =) 2400$ • $(100\% - 91\% =) 9\%$	M1 A1	
10. 2.47	B2	B1 for 2.46(8044339...). All places given must be correctly <u>rounded or truncated</u> .

11.(a) 1530 (ml)	B2	Award B1 for sight of any one of the following: <ul style="list-style-type: none"> <li>• 1360 (+ 170)</li> <li>• <math>0.17 + 1.36 (\times 1000)</math></li> </ul>
11.(b) $\frac{1530}{175} (= 8.74....)$  8 full cups	M1  A1	FT 'their volume' for part (a),  FT provided equivalent decision (to round down) is required. Amount left over, if given, must be correct for A1 e.g. 8.74 with no working is awarded M1 A0; 8 cups with 130 ml left over is awarded M1 A1.
12.(a) $32 \times 6 - 16 \times 3 - 12 \times 2 (= 192 - 48 - 24)$  120	M1  A1	
12.(b) Strategy to explore possible combinations.  $58 \times 6 = 348$ and $348 - 3 = 345$ There were 58 correct answers (and one incorrect answer)  The final question is not answered (as the mark drops from 345 to 343).	S1  B1  B1	Award S1 for evidence of trial and improvement or correct answer.  This B1 implies S1.  May be implied.
13.  Position at $260^\circ$ from Pwllheli Position at $310^\circ$ from Fishguard Position marked or two intersecting lines	M1  M1  A1	Allow dots or crosses or any unambiguous indication that the correct bearings have been drawn.  FT if at least M1 previously awarded and two intersecting lines. (Lines must originate from P and F).

<p>14.</p> <p>Sight of 190 (Total number of calls = <math>22 + 48 + 62 + 34 + 14 + 10</math>)</p> <p>Sight of any of the following:</p> <ul style="list-style-type: none"> <li>• (80% of 190 =) 152 (calls)</li> </ul> <p><b>AND</b> (less than 30 seconds =) 132 (calls)</p> <ul style="list-style-type: none"> <li>• (20% of 190 =) 38 (calls)</li> </ul> <p><b>AND</b> (more than 30 seconds =) 58 (calls)</p> <ul style="list-style-type: none"> <li>• (132 calls = <math>\frac{132}{190} \times 100 = 69.4(7..)\%</math>)</li> <li>• (58 calls = <math>\frac{58}{190} \times 100 = 30.5(2..)\%</math>)</li> </ul> <p>Conclusion 'No'.</p>	<p>B1</p> <p>M2</p> <p>A1</p>	<p>Check the graph for answers.</p> <p>FT 'their 190'. M1 for sight of either of the following:</p> <ul style="list-style-type: none"> <li>• (80% of 190 =) 152 (calls)</li> </ul> <p><b>OR</b> (less than 30 seconds =) 132 (calls)</p> <ul style="list-style-type: none"> <li>• (20% of 190 =) 38 (calls)</li> </ul> <p><b>OR</b> (more than 30 seconds =) 58 (calls)</p> <p>FT provided conclusion from correct working only and M2 previously awarded.</p>
<p>15.(a)</p> <p>13 (cm)</p>	<p>B2</p>	<p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> <li>• sight of 2.01 and 1.88</li> <li>• sight of 201 and 188</li> <li>• sight of 0.13 (m)</li> <li>• 2.01 – 'their 1.88' correctly converted to cm (<math>\times 100</math>)</li> <li>• 'their 2.01' – 1.88 correctly converted to cm (<math>\times 100</math>)</li> <li>• 'their 2.01' – 'their 1.88' correctly converted to cm (<math>\times 100</math>)</li> <li>• 'their 2.01' AND 'their 1.88' correctly converted to cm (<math>\times 100</math>)</li> <li>• 10 cm (from 1.85 – 1.75).</li> </ul>
<p>15.(b)(i)</p> <p>Explanation with reference to mass and height increasing or decreasing together e.g. "the heavier players are taller" "as mass decreases so does the height" "they both increase"</p>	<p>E1</p>	
<p>15.(b)(ii)</p> <p>(Height =) 1.78 (m) AND (Mass =) 119</p>	<p>B1</p>	
<p>15.(c)</p> <p>Straight line of best fit, following the trend with some points above and some below the line.</p>	<p>B1</p>	<p>Allow intention of a straight line.</p>
<p>15.(d)</p> <p>Explanation of why it is not an appropriate estimate, e.g. "the diagram only considers the trend of players up to 122(kg)" "out of range"</p>	<p>E1</p>	<p>Allow "the heights of the four players around 120 kg are very different so using the line in this region is not appropriate".</p>

<p>16.</p> $(QR = ) \frac{2 \times 36}{8} \text{ or equivalent}$ $= 9 \text{ (cm)}$ $(PR^2 = ) 8^2 + 9^2 \text{ or equivalent}$ $PR^2 = 145 \text{ or } (PR = ) \sqrt{145}$ $(x = ) 12(0.041\ldots\text{cm})$	M1     A1     M1     A1     A1     	<p>Check diagram for answers. Award M1 for <math>\frac{8 \times QR}{2} = 36</math>.</p> <p>May be implied in later working (M1A1).</p> <p>Note: <math>(PR^2 = ) 64 + 81</math>. FT 'their derived 9'.</p> <p>Final answer of <math>x = 145</math> is M1A0A0. FT provided their answer &gt; 'their 9' and &gt; 8.</p> <p>FT from M1 for the correctly evaluated square root of 'their 145' provided their answer &gt; 9.</p> <p><u>Alternative method to find <math>x</math></u> A correct and complete method (using trigonometric relationships)</p> <p>(<math>x = ) 12(0.041\ldots\text{cm})</math>)</p>
<p>17.</p> <p>Unambiguous angle bisector of <math>BCD \pm 2^\circ</math></p> <p>Arc centre A with radius <math>7 \text{ cm} \pm 2 \text{ mm}</math></p> <p>Correct region identified</p>	B1     B1     B1     	<p>All lines and arcs must be of sufficient length to be able to select the correct region.</p> <p>Any valid method may be used to bisect the angle e.g. using a protractor or a pair of compasses.</p> <p>FT provided B1 awarded for the arc.</p>
<p>18.</p> $(\text{Volume of cylinder} = ) \pi \times 2.3^2 \times 5$ $= 83(0.095\ldots) \text{ or } 26.45\pi \text{ (cm}^3\text{)}$ $(\text{Density of metal} = ) 423.1 \div 83(0.095\ldots)$ <p>Accept an answer between 5 and 5.1 (g/cm<sup>3</sup>)</p>	M1     A1     M1     A1     	<p>May be seen or implied in later working.</p> <p>Accept an answer between 83 and 83.11 inclusive.</p> <p>FT <math>423.1 \div \text{'their derived volume of cylinder'}</math>, provided <math>\pi</math> has been used in its calculation.</p>

<p>18. <u>Alternative method:</u></p> <p>(Density of metal =) <math display="block">\frac{423.1}{\pi \times 2.3^2 \times 5}</math></p> <p>Accept an answer between 5 and 5.1 (g/cm<sup>3</sup>)</p>	<p>M2</p>	<p>Award M1 for sight of <math>\pi \times 2.3^2 \times 5</math>.</p>
	<p>A2</p>	<p>A1 for sight of <math>\frac{423.1}{26.45\pi}</math> or <math>\frac{8462}{529\pi}</math> or <math>\frac{15.9(96\dots)}{\pi}</math> or any other simplified fraction with <b>one</b> step left to carry out.</p>

## How to read the mark scheme

- 'M' marks are awarded for any correct method applied to appropriate working, even though a numerical error may be involved. Once earned they cannot be lost.
- 'm' marks are dependant method marks. They are only given if the relevant previous 'M' mark has been earned.
- 'A' marks are given for a numerically correct stage, for a correct result or for an answer lying within a specified range. They are only given if the relevant M/m mark has been earned either explicitly or by inference from the correct answer.
- 'B' marks are independent of method and are usually awarded for an accurate result or statement.
- 'S' marks are awarded for strategy
- 'E' marks are awarded for explanation
- 'U' marks are awarded for units
- 'P' marks are awarded for plotting points
- 'C' marks are awarded for drawing curves
- 'OC' marks are awarded for 'organising and communicating', a strand of OCW (organising, communicating and writing accurately)
- 'W' marks are awarded for 'writing accurately', a strand of OCW (organising, communicating and writing accurately)
- 'SC' marks are awards for special cases
- CAO: correct answer only
- ISW: ignore subsequent working
- FT: follow through

# Assessment mapping

Qn	Topic	Max mark	AO1	AO2	AO3	Common Qn (HT)	Common marks (HT)	OCW
1	Year of national anthem; calculations	2	2					
2	Area of lawn; cost of grass seeds	8	3	5				*
3	Identifying congruent shapes	2	2					
4	Sandwich shop table	3			3			
5	School transport bar chart: median, range, mean	9	6	1	2			
6	Accurate drawing of triangle	3	3					
7	Inverse calculation	2	2					
8	Expressions; linear equations	4	4					
9	Gwalia Electric pie chart	6	1	3	2			
10	Calculation + rounding	2	2					
11	Jugs of lemon drink (metric units)	4	2		2			
12	Quiz scores (directed numbers)	5	2		3			
13	Plotting bearings	3	3			Q2a	3	
14	Mali's frequency diagram	4		4		Q3	4	
15	Scatter diagram + units	6	4	1	1	Q4abcd	6	
16	Pythagoras, area and perimeter of triangle	5			5	Q5	5	
17	Loci - Gruff's garden	3		3		Q6	3	
18	Cylinder + density	4		4		Q7	4	
	<b>Totals</b>	<b>75</b>	<b>36</b>	<b>21</b>	<b>18</b>		<b>25</b>	