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# **GCSE MARKING SCHEME**

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**SUMMER 2024**

**GCSE  
MATHEMATICS – NUMERACY  
UNIT 1 – FOUNDATION TIER  
3310U10-1**

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## About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

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**WJEC GCSE MATHEMATICS - NUMERACY**  
**SUMMER 2024 MARKING SCHEME**

Unit 1: Foundation Tier	Mark	Comments
<p>1(a) (Total cost of individual membership)  <math>380 \times 2 + 170 \times 2</math> or equivalent  <span style="float: right;">(£)1100</span></p> <p>(Amount saved)  <math>1100 - 920</math>  <span style="float: right;">(£)180</span></p>	<p>M1 A1</p> <p>M1 A1</p>	<p>May be seen in stages</p> <p>FT 'their derived 1100' provided &gt; than 920</p> <p>If no marks awarded, award SC1 for 760 and 340 seen (not added)</p>
<p><u>1(a) Alternative method 1: Subtraction method</u></p> <p><math>£920 - £170 - £170 - £380</math>  <span style="float: right;">= £200</span></p> <p><math>£380 - £200</math>  <span style="float: right;">= £180.</span></p>	<p>M1 A1</p> <p>M1 A1</p>	<p>FT 380 – 'their 200' provided M1 previously awarded</p>
<p><u>1(a) Alternative method 2: Subtraction method</u></p> <p><math>£920 - £170 - £380 - £380</math>            = – £10 OR is £10 more than the family membership</p> <p><math>£170 + £10</math>  <span style="float: right;">= £180.</span></p>	<p>M1 A1</p> <p>M1 A1</p>	<p>FT 170 + 'their 10' provided M1 previously awarded</p>
<p><u>1(a) Alternative method 3: Subtraction method</u></p> <p><math>£920 - £170 - £170</math>  <span style="float: right;">= £580</span></p> <p><math>£380 + £380 - £580</math>  <span style="float: right;">= £180.</span></p>	<p>M1 A1</p> <p>M1 A1</p>	<p>FT 380 + 380 – 'their 580' provided M1 previously awarded</p>
<p><u>1(a) Alternative method 4: Subtraction method</u></p> <p><math>£920 - £380 - £380</math>  <span style="float: right;">= £160</span></p> <p><math>£170 + £170 - £160</math>  <span style="float: right;">= £180.</span></p>	<p>M1 A1</p> <p>M1 A1</p>	<p>FT 170 + 170 – 'their 160' provided M1 previously awarded</p>
<p>Full subtraction method that would lead to an answer of £180            Correct answer of £180</p>	<p>M2</p> <p>A2</p>	<p>Award M1 for sight of at least 2 values subtracted</p> <p>Award A1 for answer from 1 error only.</p>
<p>Organisation and communication</p> <p>Writing</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <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 explanations and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc.</li> </ul>

Unit 1: Foundation Tier	Mark	Comments
1(b)(i) $11 \times 20$ 220 (calories)	M1 A1	
1(b)(ii) $360 \div 12$  30 (minutes)	M1  A1	Allow $12 \div 360$ written if the intention is $360 \div 12$ e.g. counting up in 12s to at least $3 \times 12$ For $360 \div 12$ not seen but counting up in 12s seen award M1 for the sight of $\geq 180$
1(c) An acute angle	B1	
1(d) <b>No</b> indicated or unambiguously implied and correct reason given, e.g. 'Because it is not the most popular class' 'As step is the modal fitness class' 'Because yoga doesn't have the highest frequency' 'Because the most popular fitness class is step' 'Because other classes have more people in them' 'Because the number of people attending step class is higher' 'Because step is the most common class' 'Because circuits has more people attending'	E1	Allow, e.g. 'It should be step' 'It's not the highest number' 'It's not the biggest' 'Because there are others with more' 'Because it's step' 'More people do circuits' 'The steps have 12 more than yoga' 'Step does 96 people'  Do not accept 'No, because it's not in the middle of highest number and the lowest number'
1(e) (Area of tiles) Evidence of counting squares <b>within</b> the shape  Area in range 31 - 38 (cm <sup>2</sup> or m <sup>2</sup> )  'Their area' $\times 30$ Correct cost for their area	M1  A1  M1 A1	Look at diagram Allow M1 for area within and some of the squares outside If no evidence of counting squares, award M1 if answer for area is in the range 22 – 40 Award M0 if clearly working with perimeter  Number of squares in range with no evidence of counting award M1 A1  FT 'their area' $\times 30$
1(e) <u>Alternative method</u> (Area of tiles) Evidence of counting squares <b>within</b> the shape <b>and</b> counting up in 30s  Answer in the range (£)930 – (£)1140	M2  A2	If no evidence of counting squares, award M1 for evidence of <b>counting up in 30s</b> to at least 300  If A2 not awarded, award A1 for answer in the range (£)660 – (£)1200

Unit 1: Foundation Tier	Mark	Comments
<p>1(f) 9(cm) (<math>\pm 2</math>mm)  <math>9 \times 50 (\div 100)</math></p> <p>4.5 (metres)</p>	<p>B1 M1</p> <p>A1</p>	<p>(8.8 (cm) to 9.2(cm))  FT 'their 9' provided it has come from a measurement of the height or length of the van, and is <math>\geq 3</math>(cm)</p> <p>Answer must be in metres only.  Answer line takes precedence  E.g.  For an answer of 4m 50cm or 450cm using 9cm  award B1 M1 A0</p> <p>Measurements of:  8.8 cm gives 4.4 m  8.9 cm gives 4.45 m  9 cm gives 4.5 m  9.1 cm gives 4.55 m  9.2 cm gives 4.6 m</p> <p>If no marks awarded, award SC1 for an answer in the range 4.3m to 4.7m (but outside 4.4m to 4.6m)</p>

Unit 1: Foundation Tier	Mark	Comments
<p>2(a) (Wednesday) 25<sup>th</sup> (Thursday) 26<sup>th</sup> and (Friday) 27<sup>th</sup> June Or 25(th) to 27(th) June</p>	<p>B3</p>	<p>Look at calendar for indication throughout the question If B3 not awarded: Award B2 for one of the following (for identifying 3 days when they can all go):</p> <ul style="list-style-type: none"> <li>• 26<sup>th</sup> June and 27<sup>th</sup> June only</li> <li>• 25<sup>th</sup> June and 26<sup>th</sup> June only</li> <li>• 25<sup>th</sup> June only</li> <li>• 25<sup>th</sup>, 26<sup>th</sup> and 27<sup>th</sup> without any indication of June</li> </ul> <p>For all dates listed below, if the 1<sup>st</sup> date given and none of the others then award B2</p> <ul style="list-style-type: none"> <li>• 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> March</li> <li>• 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> March</li> <li>• 19<sup>th</sup>, 20<sup>th</sup> and 21<sup>st</sup> March</li> <li>• 26<sup>th</sup>, 27<sup>th</sup> and 28<sup>th</sup> March</li> <li>• 31<sup>st</sup> March, 1<sup>st</sup> and 2<sup>nd</sup> April</li> <li>• 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> April</li> <li>• 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> April</li> <li>• 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> April</li> <li>• 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> June</li> <li>• 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> June</li> <li>• 18<sup>th</sup>, 19<sup>th</sup> and 20<sup>th</sup> June</li> </ul> <p>If B3 or B2 not awarded: Award B1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• An answer of June with or without dates</li> <li>• Identifying that they cannot go during the Months of May, July <b>AND</b> August</li> <li>• Identifying that they can <b>ONLY</b> go March, April <b>AND</b> June eg answer of 'March, April or June'</li> <li>• Identifying that they cannot go on any Saturday <b>AND</b> Sunday (allow if not indicated on school holidays)</li> <li>• Identifying that they cannot go on the last 3 Tuesdays <b>AND</b> first 2 Fridays of each month</li> </ul> <p>Answer line takes precedence but note: If more than one answer is given, mark the response that gains the least credit.</p>

Unit 1: Foundation Tier	Mark	Comments
<p>2(b) (Pier Apartment) (Discount 10% of 250=) (£)25 or (Discount 10% of 500=) (£)50</p> <p><math>2 \times 250 - 2 \times 25</math> OR <math>500 - 50</math> OR <math>2 \times (250 - 25)</math></p> <p>(Promenade Hotel) (£)110 <math>\times 2 \times 2</math> or equivalent</p> <p>(£) 450 AND (£)440</p> <p style="text-align: right;">Difference of (£)10</p>	<p>B1</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>B1</p>	<p></p> <p>FT <math>2 \times 250 - 2 \times</math> 'their derived 25' Or <math>500 -</math> 'their derived 50'</p> <p>FT from B0, M1, M1</p> <p>FT provided at least one M1 previously awarded and (£)450 OR (£)440 correct with the FT difference correctly evaluated</p>
<p><i>2(b) Alternative method working initially with 1 night (Pier Apartment)</i> (Discount 10% of 250=) (£)25</p> <p><math>250 - 25</math></p> <p>(Promenade Hotel) (£)110 <math>\times 2</math></p> <p><math>((£)225 - (£)220) \times 2</math> OR <math>(£)5 \times 2</math></p> <p>(Difference of) (£)10</p>	<p>B1</p> <p>M1</p> <p>M1</p> <p>M1</p> <p>A1</p>	<p><i>Note: must be clearly working with 1 night initially</i></p> <p>FT 'their derived 25'</p> <p>FT from B0, M1, M1</p> <p>FT a difference correctly evaluated provided at least one M1 previously awarded with (£)225 OR (£)220 correct and there has been an attempt to double at least one of the values</p>
<p>2(c) <math>24 \times 15</math> or equivalent 360 (cm<sup>2</sup>) AND No indicated</p>	<p>M1</p> <p>A1</p>	<p>Note: <math>24 \times 2 + 15 \times 2 = 78</math> gains M0A0 as working with perimeter</p>

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<p>3. <math>30 + 3 \times 50 + 15</math></p> <p>3 hours and 15 minutes or 195 (minutes)</p> <p>10:45 (am)</p>	<p>M2</p> <p>A1</p> <p>B1</p>	<p>May be seen in stages Award M1 for any one of the following</p> <ul style="list-style-type: none"> <li>• <math>3 \times 50</math></li> <li>• 150 or 2 hours 30 mins</li> </ul> <p>OR for allowing one omitted or 150 treated incorrectly</p> <ul style="list-style-type: none"> <li>• <math>(30 + 15=)</math> 45</li> <li>• <math>(30 + 15 + 50=)</math> 95 or 1 hour 35 mins</li> <li>• <math>(30 + 15 + 100=)</math> 145 or 2 hours 25 mins</li> <li>• <math>(30 + 150=)</math> 180 or 3 hours</li> <li>• <math>(15 + 150=)</math> 165 or 2 hours 45 mins</li> </ul> <p>CAO. Mark final answer.</p> <p>FT 2pm – ‘their 3hr 15 mins’ including 15 and/or 30 correctly evaluated</p>																																																																								
<p><u>3. Alternative method</u></p> <p>2pm</p> <p>– 15 mins correctly evaluated</p> <p>– <math>3 \times 50</math> mins (2 hours 30 mins) correctly subtracted</p> <p>– 30 mins correctly evaluated</p>	<p>B1</p> <p>B2</p> <p>B1</p>	<p>These marks can be completed in any order and are FT marks</p> <p>Award B1 for <math>3 \times 50</math> or 150</p> <p>Answer of 10:45 (am) gains B4</p> <p>Tables below give times depending on the order that they have been subtracted from 2pm:</p> <table border="1" data-bbox="858 1059 1362 1193"> <thead> <tr> <th>Mark</th> <th>Method 1</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>B1</td> <td>-15 mins</td> <td>1:45 (pm)</td> </tr> <tr> <td>B2</td> <td>-2hrs 30 mins</td> <td>11:15 (am)</td> </tr> <tr> <td>B1</td> <td>-30 mins</td> <td>10:45 (am)</td> </tr> </tbody> </table> <table border="1" data-bbox="858 1218 1362 1352"> <thead> <tr> <th>Mark</th> <th>Method 2</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>B1</td> <td>-15 mins</td> <td>1:45 (pm)</td> </tr> <tr> <td>B1</td> <td>-30 mins</td> <td>1:15 (pm)</td> </tr> <tr> <td>B2</td> <td>-2hrs 30 mins</td> <td>10:45 (am)</td> </tr> </tbody> </table> <table border="1" data-bbox="858 1377 1362 1512"> <thead> <tr> <th>Mark</th> <th>Method 3</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>B1</td> <td>-30 mins</td> <td>1:30 (pm)</td> </tr> <tr> <td>B1</td> <td>-15 mins</td> <td>1:15 (pm)</td> </tr> <tr> <td>B2</td> <td>-2hrs 30 mins</td> <td>10:45 (am)</td> </tr> </tbody> </table> <table border="1" data-bbox="858 1536 1362 1671"> <thead> <tr> <th>Mark</th> <th>Method 4</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>B1</td> <td>-30 mins</td> <td>1:30 (pm)</td> </tr> <tr> <td>B2</td> <td>-2hrs 30 mins</td> <td>11:00 (am)</td> </tr> <tr> <td>B1</td> <td>-15 mins</td> <td>10:45 (am)</td> </tr> </tbody> </table> <table border="1" data-bbox="858 1695 1362 1830"> <thead> <tr> <th>Mark</th> <th>Method 5</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>B2</td> <td>-2hrs 30 mins</td> <td>11:30 (am)</td> </tr> <tr> <td>B1</td> <td>-15 mins</td> <td>11:15 (am)</td> </tr> <tr> <td>B1</td> <td>-30 mins</td> <td>10:45 (am)</td> </tr> </tbody> </table> <table border="1" data-bbox="858 1854 1362 1989"> <thead> <tr> <th>Mark</th> <th>Method 6</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>B2</td> <td>-2hrs 30 mins</td> <td>11:30 (am)</td> </tr> <tr> <td>B1</td> <td>-30 mins</td> <td>11:00 (am)</td> </tr> <tr> <td>B1</td> <td>-15 mins</td> <td>10:45 (am)</td> </tr> </tbody> </table>	Mark	Method 1	Time	B1	-15 mins	1:45 (pm)	B2	-2hrs 30 mins	11:15 (am)	B1	-30 mins	10:45 (am)	Mark	Method 2	Time	B1	-15 mins	1:45 (pm)	B1	-30 mins	1:15 (pm)	B2	-2hrs 30 mins	10:45 (am)	Mark	Method 3	Time	B1	-30 mins	1:30 (pm)	B1	-15 mins	1:15 (pm)	B2	-2hrs 30 mins	10:45 (am)	Mark	Method 4	Time	B1	-30 mins	1:30 (pm)	B2	-2hrs 30 mins	11:00 (am)	B1	-15 mins	10:45 (am)	Mark	Method 5	Time	B2	-2hrs 30 mins	11:30 (am)	B1	-15 mins	11:15 (am)	B1	-30 mins	10:45 (am)	Mark	Method 6	Time	B2	-2hrs 30 mins	11:30 (am)	B1	-30 mins	11:00 (am)	B1	-15 mins	10:45 (am)
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<p>4(a) Method to compare the same number of toothbrushes, e.g. for 1, 5, 6, 15, 30 or 60 toothbrushes</p> <ul style="list-style-type: none"> <li>(1) <math>1(.)44 \div 3</math> AND <math>2(.)25 \div 5</math></li> <li>(3) <math>(1.)44</math> AND <math>3 \times 2(.)25 \div 5</math></li> <li>(5) <math>2 \times 1(.)44 - 1(.)44 \div 3</math> (AND <math>2(.)25</math>)</li> <li>(5) <math>5 \times 1(.)44 \div 3</math> (AND <math>2(.)25</math>)</li> <li>(6) <math>2 \times 1(.)44</math> AND <math>2(.)25 \div 5 + 2(.)25</math></li> <li>(15) <math>5 \times 1(.)44</math> AND <math>3 \times 2(.)25</math></li> <li>(30) <math>10 \times 1(.)44</math> AND <math>6 \times 2(.)25</math></li> <li>(60) <math>20 \times 1(.)44</math> AND <math>12 \times 2(.)25</math></li> </ul> <p>An accurate calculation for a 3 pack <b>OR</b> a 5 pack, e.g. 48(p) or 45(p), (£)7.20 or (£)6.75</p> <p>Cost of same number of toothbrushes for 3 pack <b>AND</b> 5 pack <b>WITH</b> conclusion pack of 5 is better value for money</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>In £s:</p> <table border="1"> <thead> <tr> <th></th> <th>1</th> <th>3</th> <th>5</th> <th>6</th> <th>15</th> <th>30</th> <th>60</th> </tr> </thead> <tbody> <tr> <td>3pk</td> <td>0.48</td> <td>(1.44)</td> <td>2.40</td> <td>2.88</td> <td>7.20</td> <td>14.40</td> <td>28.80</td> </tr> <tr> <td>5pk</td> <td>0.45</td> <td>1.35</td> <td>(2.25)</td> <td>2.70</td> <td>6.75</td> <td>13.50</td> <td>27.00</td> </tr> </tbody> </table> <p>If units are given, they must be correct Ignore any subsequent working, unless it adversely impacts on the conclusion</p>		1	3	5	6	15	30	60	3pk	0.48	(1.44)	2.40	2.88	7.20	14.40	28.80	5pk	0.45	1.35	(2.25)	2.70	6.75	13.50	27.00
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<p>4(b) (100 ml for) <math>93 \times 4 \div 3</math> or <math>93 \div 3 + 93</math> or <math>93 \times 20 \div 15</math> or <math>93 \times 100 \div 75</math> or equivalent  (£)1.24 or 124(p)</p>	<p>M2</p> <p>A1</p>	<p>M1 for any one of the following:</p> <ul style="list-style-type: none"> <li>(25 ml for) <math>93 \div 3</math> (= 31p)</li> <li>(5 ml for) <math>93 \div 15</math> (= 6.2p)</li> <li>(1 ml for) <math>93 \div 75</math> (= 1.24p)</li> </ul> <p>If units are given, they must be correct</p>																								
5(a) 15(:)00 or 3 p.m.	B1	Allow 15(:)00 pm, 3(:)00 or 3 o'clock Do not accept 15(:)00 am, 3 a.m, 03:00 (p.m)																								
5(b) 14 (km)	B1																									
5(c) 12:00 to 12:30	B1																									
<p>6. (Tax on first 15000 euros) <math>0.2(0) \times 15000</math>  (Tax on remaining income) <math>0.3(0) \times (26000 - 15000)</math>  (Total income tax) 6300 (euros)</p>	<p>M1</p> <p>M2</p> <p>A2</p>	<p>Ignore £ written for euros (= 3000 euros)</p> <p>(= 3300 euros) M1 for (Remaining income to be taxed) <math>26000 - 15000</math> (= 11000 euros)</p> <p>Ignore any further working (such as to calculate income – income tax)</p> <p>A1 for either part of the tax correctly evaluated, i.e. <math>(0.2(0) \times 15000 =)</math> 3000 (euros) or <math>(0.3(0) \times (26000 - 15000) =)</math> 3300 (euros)</p>																								



Unit 1: Foundation Tier	Mark	Comments
9(a) $50 \times 3 \times 1.8(0)$ or $50 \times 3 \times 180$  <p style="text-align: center;">(£) 270 or 27000(p)</p>	M2           A2	M1 for any of the following: <ul style="list-style-type: none"> <li>• <math>50 \times 3</math></li> <li>• <math>50 \times 1.8(0)</math></li> <li>• <math>50 \times 180</math></li> <li>• <math>3 \times 1.8(0)</math></li> <li>• <math>3 \times 180</math></li> </ul> For A2, if units are given, they must be correct, otherwise A1 for 270p or £27000  Ignoring units, A1 for any of the following: <ul style="list-style-type: none"> <li>• <math>(50 \times 3 =)</math> 150</li> <li>• <math>(50 \times 1.8(0) =)</math> 90</li> <li>• <math>(50 \times 180 =)</math> 9000</li> <li>• <math>(3 \times 1.8(0) =)</math> 5.4(0)</li> <li>• <math>(3 \times 180 =)</math> 540</li> </ul>
9(b)(i) (Mean of 8 temperatures is $-56 \div 8 =$ ) $-7$ (°C)	B3	Must not be from incorrect working, other than allowing from $56 \div 8$  B2 for any one of the following: <ul style="list-style-type: none"> <li>• <math>-56 \div 8</math></li> <li>• <math>56 \div 8 = 7</math></li> </ul> B1 for any one of the following: <ul style="list-style-type: none"> <li>• (sum of temperatures) <math>-56</math></li> <li>• (sum of temperatures) <math>56</math></li> <li>• sight of 'their sum of temperatures' <math>\div 8</math>, provided the summation is <u>not</u> from a sum involving all positive integers or all negative integers, with or without a negative sign inserted. If '<math>\div 8</math>' is not seen, it may be implied from 'their sum' and 'their mean' (rounded or truncated)</li> </ul>
9(b)(ii) $(-56 + -16) \div 9$ or $-72 \div 9$  <p style="text-align: center;"><math>-8</math> (°C)</p>	M1   A1	FT 'their $-56$ ' from (b)(i)  On FT allow a rounded or truncated answer Allow a correctly rounded or truncated answer, to 1d.p. for '(their $-56$ ' + $-16) \div 9$ to imply M1 A1
9(c)(i) $20 \times (8.6 (\pm 0.2))$  <p style="text-align: center;"><math>172 (\pm 4 \text{ m})</math></p>	M1  A1	Do not award from sight of an incorrect evaluation of 'their $8.6$ ' $\times 20$
9(c)(ii) $232^\circ \pm 2^\circ$	B1	



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# **GCSE MARKING SCHEME**

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**SUMMER 2024**

**GCSE  
MATHEMATICS – NUMERACY  
UNIT 2 – FOUNDATION TIER  
3310U20-1**

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## About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

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Unit 2: Foundation Tier	Mark	Comments										
2. (b) 4 buses	B3	<p>Award B3 for 4 buses, provided it doesn't come from incorrect working <b>or values</b> but allow <math>110 \div 37 = 2.97</math> or 3 buses (or equivalent) and then 4 buses as their final answer.</p> <p>If B3 not awarded, award B2 for any one of the following:</p> <ul style="list-style-type: none"> <li>• <math>(110 + 11) \div 37</math></li> <li>• <math>121 \div 37</math></li> <li>• <math>3 \cdot 2(7027\dots)</math> or 3.3</li> <li>• 3 buses with 10 (people left) or 3 r 10</li> <li>• <math>121 - 3 \times 37</math> and have 10 (left) with answer of 3</li> <li>• Sight of <math>4 \times 37</math> or <math>37 + 37 + 37 + 37</math></li> <li>• Sight of 148</li> <li>• 'their <math>110 + 11 \div 37</math> answer rounded up</li> </ul> <p>If B2 not awarded, award B1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• Sight of <math>3 \times 37</math> or <math>37 + 37 + 37</math></li> <li>• Attempt to work with multiples of 37 up to at least 3 lots of 37 (e.g. 37, 74, 110 or 37, 73, 110)</li> <li>• Sight of 111</li> <li>• <math>110 \div 37</math></li> <li>• Answer of 3</li> <li>• 'their <math>110 + 11 \div 37</math> answer rounded down</li> </ul>										
2. (c) (i)		<p>Answers in the table take precedence Allow tallies for the correct number of pupils</p> <table border="1" data-bbox="177 1055 655 1256"> <thead> <tr> <th>Activity</th> <th>Number of pupils</th> </tr> </thead> <tbody> <tr> <td>Climbing</td> <td>6</td> </tr> <tr> <td>High ropes</td> <td>4</td> </tr> <tr> <td>Bowling</td> <td>3</td> </tr> <tr> <td>Sailing</td> <td>11</td> </tr> </tbody> </table> <p>B1 Award B1 for climbing = 6 AND high ropes = 4</p> <p>B1 Award B1 for bowling = 3, F.T 'their climbing' <math>\div 2</math></p> <p>B1 Award B1 for sailing = 11 FT <math>24 - 4 -</math> 'their climbing' – 'their bowling'</p>	Activity	Number of pupils	Climbing	6	High ropes	4	Bowling	3	Sailing	11
Activity	Number of pupils											
Climbing	6											
High ropes	4											
Bowling	3											
Sailing	11											
2. (c) (ii) unlikely	B1											

Unit 2: Foundation Tier	Mark	Comments																				
<p>3.</p> <table border="1" data-bbox="134 253 624 322"> <tr> <td>5:30 p.m.</td> <td><i>The Football Show</i></td> </tr> <tr> <td>6:10 p.m.</td> <td><i>Politics Cymru</i></td> </tr> </table> <p>OR</p> <table border="1" data-bbox="134 416 630 486"> <tr> <td>5:30 p.m.</td> <td><i>Politics Cymru</i></td> </tr> <tr> <td>5:50 p.m.</td> <td><i>The Football Show</i></td> </tr> </table>  <table border="1" data-bbox="134 786 630 855"> <tr> <td>6:45 p.m.</td> <td><i>Cartoon Time</i></td> </tr> <tr> <td>7:10 p.m.</td> <td><i>Baking Fun</i></td> </tr> </table> <p>OR</p> <table border="1" data-bbox="134 943 630 1012"> <tr> <td>6:45 p.m.</td> <td><i>Baking Fun</i></td> </tr> <tr> <td>7:35 p.m.</td> <td><i>Cartoon Time</i></td> </tr> </table>	5:30 p.m.	<i>The Football Show</i>	6:10 p.m.	<i>Politics Cymru</i>	5:30 p.m.	<i>Politics Cymru</i>	5:50 p.m.	<i>The Football Show</i>	6:45 p.m.	<i>Cartoon Time</i>	7:10 p.m.	<i>Baking Fun</i>	6:45 p.m.	<i>Baking Fun</i>	7:35 p.m.	<i>Cartoon Time</i>	<p>B2</p> <p>B2</p> <p>B2</p>	<p>Accept unambiguous indication of programme names E.g. 40 minute news for the football show. Allow correct use of 24-hour time.</p> <p>Award B1 for any one of the following:</p> <ul style="list-style-type: none"> <li><i>The Football Show</i> <b>AND</b> <i>Politics Cymru</i> on first two lines on RHS in either order</li> <li><b>Strict</b> FT for the 3<sup>rd</sup> time in the table from 'their given first programme on the 2<sup>nd</sup> line in the table' i.e. Football show and then 6:10 or Politics Cymru and then 5:50 or Cartoon Time and then 5:55 or Baking Fun and then 6:20</li> <li>Consistent working backwards from 6:30pm for the <b>whole 3<sup>rd</sup> line of the table</b> i.e. 5:50 and then Football show or 6:10 and then Politics Cymru or 6:05 and then Cartoon Time or 5:40 and then Baking Fun</li> </ul> <p>Award B1 for any one of the following:</p> <ul style="list-style-type: none"> <li>6:45 (pm) <b>AND</b> <i>Cartoon Time</i></li> <li>6:45 (pm) <b>AND</b> <i>Baking Fun</i></li> <li><b>Strict</b> FT for 'their given third programme on the 5<sup>th</sup> line' i.e. 6:45 (pm) <b>AND</b> Football show <b>AND</b> then 7:25 or 6:45 (pm) <b>AND</b> Politics Cymru <b>AND</b> then 7:05</li> <li>Consistent working backwards from 8pm for the <b>whole 6<sup>th</sup> line of the table</b> i.e. 7:20 and then Football show or 7:40 and then Politics Cymru or 7:35 and then Cartoon Time or 7:10 and then Baking Fun</li> <li>if a programme stated (on 5<sup>th</sup> line of the table) has a consistent start and end time for their programme. E.g. on 5<sup>th</sup> line 7pm <b>and</b> Football show <b>and</b> then 7:40pm on the next line <b>or</b> 6:40 <b>and</b> Cartoon Time <b>and</b> 7:05 on the next line</li> </ul> <p>If repeated use of a programme gains marks in both sections penalise -1 e.g. Cartoon Time and then 5:55 in first section and then</p> <table border="1" data-bbox="895 1552 1394 1621"> <tr> <td>6:45 p.m.</td> <td><i>Cartoon Time</i></td> </tr> <tr> <td>7:10 p.m.</td> <td><i>Baking Fun</i></td> </tr> </table> <p>Award B1 B2 -1 or B0 B2</p> <p>If <b>no marks awarded for the whole question</b>, award SC1 for:</p> <ul style="list-style-type: none"> <li><b>BOTH</b> <i>Cartoon Time</i> <b>AND</b> <i>Baking Fun</i> given in the 5<sup>th</sup> and 6<sup>th</sup> lines in the programme column (in either order)</li> </ul>	6:45 p.m.	<i>Cartoon Time</i>	7:10 p.m.	<i>Baking Fun</i>
5:30 p.m.	<i>The Football Show</i>																					
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Unit 2: Foundation Tier	Mark	Comments
<p>4(a) (Deal A = ) (£)19.99 + (£)28.99 × 24  <b>AND</b>  (Deal B = ) (£)100(.00) + (£)24.36 × 24</p> <p>(Deal A = ) (£)715.75 <b>AND</b> (Deal B = ) (£)684.64</p> <p>Deal B (is cheaper by) <b>AND</b> (£)31.11</p>	<p>M3</p> <p>A1</p> <p>B1</p>	<p>Award M2 for any one of the following</p> <ul style="list-style-type: none"> <li>• (Deal A = ) (£)19.99 + 28.99 × 24</li> <li>• (Deal B = ) (£)100(.00) + 24.36 × 24</li> </ul> <p>Award M1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• Sight of (£)28.99 × 24 or (£)695.76</li> <li>• Sight of (£)24.36 × 24 or (£)584.64</li> <li>• Sight of (£)1175.52 (BIDMAS error Deal A)</li> <li>• Sight of (£)2984.64 (BIDMAS error Deal B)</li> </ul> <p>CAO</p> <p>If M0A0 awarded, award SC1 for any one of the following:  (19.99 + 29 × 24=) (£)715.99  (20 + 28.99 × 24=) (£)715.76  (20 + 29 × 24=) (£)716  (100 + 24.4(0) × 24=) (£)685.6(0)  (100 + 24 × 24=) (£)676</p> <p>FT the difference between ‘their <b>derived</b> Deal A’ and ‘their <b>derived</b> Deal B’ <b>with</b> ‘their cheaper’ deal stated provided at least one mark previously awarded.  <b>Note:</b>  For use of 12 months instead of 24 months award:  SC1 for sight of (19.99 + 28.99 × 12 =) (£)367.87  SC1 for sight of (100 + 24.36 × 12 =) (£)392.32.  B1 for the correct conclusion with the correct difference on follow-through (Deal A AND (£)24.45) provided at least one mark awarded.</p>
<p><u>4(a) Alternative method for difference</u>  (Monthly payments difference =)  [(£)28.99-(£)24.36] × 24 or equivalent</p> <p>(Deal B cheaper by = ) (£)111.12</p> <p>(One off payments difference=) (£)100(.00) - (£)19.99  (Deal A is cheaper by = ) (£)80.01</p> <p>Deal B (is cheaper by) <b>AND</b> (£)31.11</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>B1</p>	<p>(695.76 – 584.64)</p> <p>If M0A0 M0A0 awarded, award SC1 for any one of the following:  (£) 31.35 from (29 – 24.36) × 24 - (100 – 19.99)  (£) 31.36 from (29 – 24.36) × 24 - (100 – 20)  (£) 30.15 from (28.99 – 24.40) × 24 - (100 – 19.99)  (£) 30.16 from (28.99 – 24.40) × 24 - (100 – 20)  (£) 39.75 from (28.99 – 24) × 24 - (100 – 19.99)  (£) 39.76 from (28.99 – 24) × 24 - (100 – 20)  (£) 39.99 from (29 – 24) × 24 - (100 – 19.99)  (£) 40 from (29 – 24) × 24 - (100 – 20)  (£) 30.39 from (29 – 24.40) × 24 - (100 – 19.99)  (£) 30.4(0) from (29 – 24.40) × 24 - (100 – 20)</p> <p>FT the difference between ‘their <b>derived</b> monthly payments difference’ <b>and</b> ‘their <b>derived</b> one-off payment difference’ with correct conclusion provided at least one mark previously awarded.  <b>Note:</b> For use of 12 months instead of 24, award:  M1 for 100 – 19.99  A1 for (£)80.01  SC1 for sight of (28.99 × 12 - 24.36 × 12) (£)55.56  and the correct conclusion with the correct difference on follow-through (Deal A and 24.45)</p>

Unit 2: Foundation Tier	Mark	Comments
<p>Organisation and communication</p> <p>Writing</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <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 explanations and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc.</li> </ul>
<p>4(b) A line of 12.8cm (<math>\pm 2</math>mm) (or a point) in a correct position drawn within the angle tolerance (<math>\pm 2^\circ</math>)</p> <p>Screen size = 14.3 cm (<math>\pm 2</math>mm) OVERLAY</p>	<p>B2</p> <p>B1</p>	<p>If 2 'vertical lines' given, mark the line that gains the most marks from the first B2</p> <p>Award B1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• a line drawn (or point indicated) of length 12.8cm (<math>\pm 2</math>mm) in a correct position but out of the angle tolerance (<math>\pm 2^\circ</math>)</li> <li>• a line drawn from the given line (or point indicated) of length 12.8cm (<math>\pm 2</math>mm) within the angle tolerance (<math>\pm 2^\circ</math>) but not in a correct position</li> </ul> <p>Strict FT from their diagram. If B2 previously awarded, then award the final B1 provided:</p> <ul style="list-style-type: none"> <li>• 'their diagonal' is measured correctly (<math>\pm 2</math> mm) (may need to check both diagonals) AND</li> <li>• this measurement lies between 13.9 and 14.7 cm (i.e. 14.3 cm <math>\pm 4</math> mm).</li> </ul> <p>If B1 or B0 previously awarded, award the final B1 for 'their diagonal' measured correctly (<math>\pm 2</math>mm) (may need to check both diagonals)</p> <p>Answer must be given in cm <b>and</b> to 1 decimal place for B1</p> <p>Award SC1 for an answer of 14.3 (cm) from use of Pythagoras' Theorem.</p>

Unit 2: Foundation Tier	Mark	Comments								
<p>5. <math>6 \times 7 + 5 \times 180</math> or equivalent (42 + 900)</p> <p style="text-align: right;">942 (cm)</p>	<p>M2</p> <p>A2</p>	<p>May be seen in stages but M2 only awarded if intention of adding <math>6 \times 7</math> and <math>5 \times 180</math> is seen.</p> <p>Award M1 for any one of the following. May be embedded within working.</p> <ul style="list-style-type: none"> <li>• sight of <math>6 \times 7</math></li> <li>• sight of <math>5 \times 180</math></li> </ul> <p>Answer line takes precedence.</p> <p>Award A1 for any one of the following. May be embedded within working.</p> <ul style="list-style-type: none"> <li>• <math>(6 \times 7 =) 42</math></li> <li>• <math>(5 \times 180 =) 900</math></li> </ul> <p>If no marks awarded, award SC2 for an answer of 1129 (cm) from using 6 panels and 7 posts.</p> <p>If no marks awarded, award SC1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• An answer of 381 (cm) (from use of 3 posts and 2 panels)</li> <li>• Sight of 5 panels with 6 posts drawn</li> <li>• <math>7 \times 7 + 6 \times 180</math> (<math>49 + 1080</math>)</li> </ul>								
<p>6. (Amount needed to save after next week) (£)510 – 165 or (£) 510 – (95 + 70) or (£) 510 – 95 – 70 (=£345)</p> <p>(Amount to save per week £) <math>\div 12</math> (£) 28.75</p>	<p>M2</p> <p>m1</p> <p>A1</p>	<p>May be seen in stages Allow missing brackets provided not contradicted in further working M1 for sight of any one of</p> <ul style="list-style-type: none"> <li>• <math>510 - 95 (= £415)</math></li> <li>• <math>510 - 70 (= £440)</math></li> </ul> <p>Depends on at least M1 previously awarded</p> <p>CAO. ISW FT provided at least 2 marks previously awarded</p> <ul style="list-style-type: none"> <li>• FT from M1 m1 for A1: <ul style="list-style-type: none"> <li>○ <math>415 \div 12 = (£)34.58(333\dots)</math> or (£)34.59</li> <li>○ <math>440 \div 12 = (£)36.66(666\dots)</math> or (£)36.67</li> </ul> </li> <li>• FT from M2 m0 for A1: <ul style="list-style-type: none"> <li>○ <math>345 \div 13 = (£)26.53(8\dots)</math> or (£)26.54</li> <li>○ <math>345 \div 11 = (£)31.36(36\dots)</math> or (£)31.37</li> </ul> </li> </ul> <p>If no marks, award any one of the following:</p> <table border="1" data-bbox="858 1570 1500 1794"> <tr> <td data-bbox="858 1570 954 1659">SC2</td> <td data-bbox="954 1570 1500 1659">(<math>\pounds</math>)28.75 &lt; answer <math>\leq</math> (<math>\pounds</math>)29, from supporting working, e.g. <math>12 \times 29 + 95 + 70 = (\pounds)513</math></td> </tr> <tr> <td data-bbox="858 1659 954 1727">SC1</td> <td data-bbox="954 1659 1500 1727">(<math>\pounds</math>)28.75 &lt; unsupported answer <math>\leq</math> (<math>\pounds</math>)29</td> </tr> <tr> <td data-bbox="858 1727 954 1760">SC1</td> <td data-bbox="954 1727 1500 1760">answer (<math>\pounds</math>)13.75 from <math>165 \div 12</math></td> </tr> <tr> <td data-bbox="858 1760 954 1794">SC1</td> <td data-bbox="954 1760 1500 1794">answer (<math>\pounds</math>)42.50 from <math>510 \div 12</math></td> </tr> </table>	SC2	( $\pounds$ )28.75 < answer $\leq$ ( $\pounds$ )29, from supporting working, e.g. $12 \times 29 + 95 + 70 = (\pounds)513$	SC1	( $\pounds$ )28.75 < unsupported answer $\leq$ ( $\pounds$ )29	SC1	answer ( $\pounds$ )13.75 from $165 \div 12$	SC1	answer ( $\pounds$ )42.50 from $510 \div 12$
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SC1	answer ( $\pounds$ )13.75 from $165 \div 12$									
SC1	answer ( $\pounds$ )42.50 from $510 \div 12$									

Unit 2: Foundation Tier	Mark	Comments
7(a)(i) $133 \times 8$ 1064 (miles)	M1 A1	Mark final answer. Allow 1064 km
7(a)(ii) $8 \times 60$ 480 (mph)	M1 A1	FT from (a)(i) $60 \times$ 'their 1064' $\div 133$ or 'their 1064' $\div \frac{133}{60}$ or 'their 1064' $\div 2.2(166\dots)$ A1 Allow A1 for $479 \text{ (mph)} < \text{answer} \leq 483.64 \text{ (mph)}$ from $1064 \div 2.2(166\dots)$ rounded or truncated to at least 1 d.p. or similar for a correctly evaluated 'their 1064' $\div 2.2(166\dots)$
7(b) $55 \times 40 \times 23$ 50 600 (cm <sup>3</sup> ) or 50 600 ml or 50.6 litres Unambiguously implies 'Yes' with one of the following: <ul style="list-style-type: none"> <li>(48 litres =) 48 000 cm<sup>3</sup></li> <li>50.6 (litres)</li> <li>a suitable appropriate statement, e.g. '50 litres is more than 48 litres'</li> </ul>	M1 A1 E1	FT from M1 A0 provided appropriate conclusion and conversion is shown Allow 'Yes' with clear <b>use of</b> 1 litre = 1000 cm <sup>3</sup> , e.g. <ul style="list-style-type: none"> <li>(48 litres is less than) 50(.6 litres)</li> <li>50(.6 litres is greater than 48 litres)</li> <li>50 000 (cm<sup>3</sup>) is greater than 48 000 (cm<sup>3</sup>)</li> </ul>
7(c) a = 43(°) b = 137(°) c = 112(°) d = 112(°)	B1 B1 B1 B1	FT b = 180 - 'their a', provided 'their b' > 90 and 'their b' $\neq$ 112 FT $360 - (68 + \text{'their a' + 'their b'})$ , provided: <ul style="list-style-type: none"> <li><math>112 &lt; \text{'their a' + 'their b'} &lt; 202</math></li> <li><math>c \neq 137</math></li> <li>their c' <math>\neq</math> 'their b'</li> </ul> FT d = 'their c', provided $90 < \text{'their c'} < 180$

8. Select the method to give the best mark:

Method using £	
Camera Fox	(62.95 + 3.90 =) (£)66.85 B1
US Camera Geek	81.20 ÷ 1.25 (£)64.96 M1 A1
Sure Camera	75 – 75 × 0.14 or 75 – 10.50 or 75 × (1 – 0.14) M1 (£)64.50 A1
Conclusion 'Sure Camera'	Costs 66.85, 64.96 and 64.50 WITH incorrect conclusion or no conclusion penalise -1

**OR**

Method using \$	
(62.95 + 3.90) × 1.25 or (£)66.85 × 1.25 or 62.95 × 1.25 + 3.90 × 1.25 M1 (\$83.56(25) or (78.69 + 4.88 = \$)83.57 Allow an answer in the range (\$ 83.55 to (\$83.57 A1	
(\$81.20 given)	
(75 – 75 × 0.14) × 1.25 or 64.50 × 1.25 or 75 × (1 – 0.14) × 1.25 M2 (\$80.62(5) or (\$80.63 A1	
Costs in dollars correct WITH incorrect conclusion or no conclusion penalise -1	

**OR method using £ and \$**

£	
Camera Fox	(62.95 + 3.90 =) (£)66.85 B1
US Camera Geek	
Sure Camera	75 – 75 × 0.14 M1 (£)64.50 A1
Conclusion	Costs (£)66.85 with (£)64.50 and (\$80.62(5) (or (\$80.63) AND conclusion 'Sure Camera' A1

\$	
(\$81.20 given)	
(75 – 75 × 0.14) × 1.25 M2 (\$80.62(5) or (\$80.63 A1	

Unit 2: Foundation Tier	Mark	Comments
<p>9.</p> <p>(Number of kWh =) <math>138 \times 39.5 \times 1.02264 \div 3.6</math>  (Cost of gas = Number of kWh) <math>\times 0(. )12</math></p> <p>(£)185.76 to (£)185.82 or 18576(p) to 18582(p)</p> <p>(Standing charge <math>30 \times (0.)32 =</math>) (£)9.6(0) or 960(p)</p> <p>(Total of gas and standing charge)  *(£)195.36 to (£)195.42 or 19536(p) to 19542(p)</p> <p>(Total including VAT =)  <math>1.05 \times 195(. )36</math> to <math>1.05 \times 195(. )42</math></p> <p>*(£)205.12 to (£)205.19(1)  or 20512(p) to 20519(.1p)</p>	<p>M1 m1</p> <p>A1</p> <p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p><u>Penalise incorrect units -1 only on first occurrence, by withholding A or B mark, not M marks</u></p> <p>(= 1548.4474 kWh)</p> <p>(1548.4474 <math>\times</math> 0.12 = £185.813688)</p> <p>CAO</p> <p>FT 'their derived cost of gas' + 'their <math>30 \times (0.)32</math>' correctly evaluated, provided 'their derived cost of gas' <math>\neq</math> 'their <math>138 \times 39.5 \times 1.02264 \div 3.6</math>' or 1548.4474 kWh  May be implied in later working</p> <p>FT 'their derived total cost of gas + 'their standing charge'</p> <p>ISW further rounding, e.g. (£)205, (£)205.20</p> <p>If final B0 B0 M0 A0, award SC1 for correctly evaluated final answer of <math>1.05 \times</math> 'derived cost of gas' having omitted the standing charge, provided 'their derived cost of gas' <math>\neq</math> 'their <math>138 \times 39.5 \times 1.02264 \div 3.6</math>' or 1548.4474 kWh</p> <p><i>*Allow answers in these ranges that may include unseen rounding or truncation from a previously written value</i></p>
<p>9. <u>Alternative method: Gas per day</u></p> <p>(Number of kWh =) <math>138 \times 39.5 \times 1.02264 \div 3.6</math>  (Number of kWh per day) <math>\div 30</math>  (Cost of gas per day) <math>\times 0(. )12</math></p> <p>(Cost of gas per day =) (£)6.19(...) or 619(...p)</p> <p>(Total of gas and standing charge)  6.51(...) or 651(...p)</p> <p>(Total including VAT =)  <math>1.05 \times 6.51(... ) \times 30</math></p> <p>*(£)205.12 to (£)205.19(1)  or 20512(p) to 20519(.1p)</p>	<p>M1 m1 m1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p><u>Penalise incorrect units -1 only on first occurrence, by withholding A or B mark, not M marks</u></p> <p>(= 1548.4474 kWh)</p> <p>(= 51.6149133...kWh)</p> <p>CAO</p> <p>FT 'their derived cost of gas per day' + <math>(0.)32</math> correctly evaluated  May be implied in later working</p> <p>(= 6.83(94...) <math>\times</math> 30 or <math>6.84 \times 30</math>)  FT 'their derived cost of gas per day + <math>(0.)32</math>, provided 'their derived cost of gas' <math>\neq</math> 'their <math>138 \times 39.5 \times 1.02264 \div 3.6</math>' or 1548.4474 kWh</p> <p>ISW further rounding, e.g. (£)205, (£)205.20</p> <p>If final B0 M0 A0, award SC1 for correctly evaluated final answer of <math>1.05 \times</math> 'derived cost of gas per day' <math>\times</math> 30 having omitted the standing charge, provided 'their cost of gas' <math>\neq</math> 'their <math>138 \times 39.5 \times 1.02264 \div 3.6</math>' or 1548.4474 kWh</p> <p><i>*Allow answers in these ranges that may include unseen rounding or truncation from a previously written value</i></p>





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# **GCSE MARKING SCHEME**

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**SUMMER 2024**

**GCSE  
MATHEMATICS – NUMERACY  
UNIT 1 – INTERMEDIATE TIER  
3310U30-1**

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## About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

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**WJEC GCSE MATHEMATICS - NUMERACY**

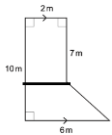
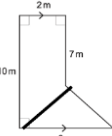
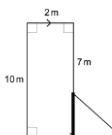
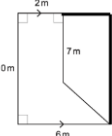
**SUMMER 2024 MARKING SCHEME**

Unit 1: Intermediate Tier	Mark	Comments																								
<p>1(a) Method to compare the same number of toothbrushes, e.g. for 1, 5, 6, 15, 30 or 60 toothbrushes</p> <ul style="list-style-type: none"> <li>(1) <math>1(.44) \div 3</math> AND <math>2(.25) \div 5</math></li> <li>(3) <math>(1(.44) \text{ AND}) 3 \times 2(.25) \div 5</math></li> <li>(5) <math>2 \times 1(.44) - 1(.44) \div 3</math> (AND <math>2(.25)</math>)</li> <li>(5) <math>5 \times 1(.44) \div 3</math> (AND <math>2(.25)</math>)</li> <li>(6) <math>2 \times 1(.44)</math> AND <math>2(.25) \div 5 + 2(.25)</math></li> <li>(15) <math>5 \times 1(.44)</math> AND <math>3 \times 2(.25)</math></li> <li>(30) <math>10 \times 1(.44)</math> AND <math>6 \times 2(.25)</math></li> <li>(60) <math>20 \times 1(.44)</math> AND <math>12 \times 2(.25)</math></li> </ul> <p>An accurate calculation for a 3 pack <b>OR</b> a 5 pack, e.g. 48(p) or 45(p), (£)7.20 or (£)6.75</p> <p>Cost of same number of toothbrushes for 3 pack <b>AND</b> 5 pack <b>WITH</b> conclusion pack of 5 is better value for money</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>In £s:</p> <table border="1"> <thead> <tr> <th></th> <th>1</th> <th>3</th> <th>5</th> <th>6</th> <th>15</th> <th>30</th> <th>60</th> </tr> </thead> <tbody> <tr> <td>3pk</td> <td>0.48</td> <td>(1.44)</td> <td>2.40</td> <td>2.88</td> <td>7.20</td> <td>14.40</td> <td>28.80</td> </tr> <tr> <td>5pk</td> <td>0.45</td> <td>1.35</td> <td>(2.25)</td> <td>2.70</td> <td>6.75</td> <td>13.50</td> <td>27.00</td> </tr> </tbody> </table> <p>If units are given, they must be correct Ignore any subsequent working, unless it adversely impacts on the conclusion</p>		1	3	5	6	15	30	60	3pk	0.48	(1.44)	2.40	2.88	7.20	14.40	28.80	5pk	0.45	1.35	(2.25)	2.70	6.75	13.50	27.00
	1	3	5	6	15	30	60																			
3pk	0.48	(1.44)	2.40	2.88	7.20	14.40	28.80																			
5pk	0.45	1.35	(2.25)	2.70	6.75	13.50	27.00																			
<p>1(b) (100 ml for) <math>93 \times 4 \div 3</math> or <math>93 \div 3 + 93</math> or <math>93 \times 20 \div 15</math> or <math>93 \times 100 \div 75</math> or equivalent  (£)1.24 or 124(p)</p>	<p>M2</p> <p>A1</p>	<p>M1 for any one of the following:</p> <ul style="list-style-type: none"> <li>(25 ml for) <math>93 \div 3</math> (= 31p)</li> <li>(5 ml for) <math>93 \div 15</math> (= 6.2p)</li> <li>(1 ml for) <math>93 \div 75</math> (= 1.24p)</li> </ul> <p>If units are given, they must be correct</p>																								
2(a) 15(:)00 or 3 p.m.	B1	Allow 15(:)00 pm, 3(:)00 or 3 o'clock Do not accept 15(:)00 am, 3 a.m, 03:00 (p.m)																								
2(b) 14 (km)	B1																									
2(c) 12:00 to 12:30	B1																									
<p>3(a) <math>2000 + 0.35 \times 2000</math> or <math>2000 + 700</math> or <math>1.35 \times 2000</math> or equivalent  2700 (bottles)</p> <p><math>2700 - 0.21 \times 2700</math> or <math>2700 - 567</math> or <math>0.79 \times 2700</math> or equivalent  2133 (bottles)</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>May be implied in further correct working</p> <p>FT 'their derived 2700' provided <math>\neq</math> 2000</p> <p>Note: If a percentage is calculated by addition of a sum of percentages, accurate percentage parts need to be given with the intention to add the appropriate parts before an M mark can be awarded, e.g. attempt <math>2700 - 21\%</math> of 2700 as: '1% 27', '10% 270' with <math>2700 - (27+270+270)</math> M1 '1% 2.7', '10% 270' with <math>2700 - (2.7+270+270)</math> M0 '1% 27', '10% 270' with <math>2700 - (27+270)</math> M0</p>																								





Unit 1: Intermediate Tier	Mark	Comments
5(a) $50 \times 3 \times 1.8(0)$ or $50 \times 3 \times 180$  <p style="text-align: center;">(£) 270 or 27000(p)</p>	M2           A2	M1 for any of the following: <ul style="list-style-type: none"> <li>• <math>50 \times 3</math></li> <li>• <math>50 \times 1.8(0)</math></li> <li>• <math>50 \times 180</math></li> <li>• <math>3 \times 1.8(0)</math></li> <li>• <math>3 \times 180</math></li> </ul> For A2, if units are given, they must be correct, otherwise A1 for 270p or £27000  Ignoring units, A1 for any of the following: <ul style="list-style-type: none"> <li>• <math>(50 \times 3 =)</math> 150</li> <li>• <math>(50 \times 1.8(0) =)</math> 90</li> <li>• <math>(50 \times 180 =)</math> 9000</li> <li>• <math>(3 \times 1.8(0) =)</math> 5.4(0)</li> <li>• <math>(3 \times 180 =)</math> 540</li> </ul>
5(b)(i) (Mean of 8 temperatures is $-56 \div 8 =$ ) $-7$ (°C)	B3	Must not be from incorrect working, other than allowing from $56 \div 8$  B2 for any one of the following: <ul style="list-style-type: none"> <li>• <math>-56 \div 8</math></li> <li>• <math>56 \div 8 = 7</math></li> </ul> B1 for any one of the following: <ul style="list-style-type: none"> <li>• (sum of temperatures) <math>-56</math></li> <li>• (sum of temperatures) <math>56</math></li> <li>• sight of 'their sum of temperatures' <math>\div 8</math>, provided the summation is <u>not</u> from a sum involving all positive integers or all negative integers, with or without a negative sign inserted. If '<math>\div 8</math>' is not seen, it may be implied from 'their sum' and 'their mean' (rounded or truncated)</li> </ul>
5(b)(ii) $(-56 + -16) \div 9$ or $-72 \div 9$  <p style="text-align: center;"><math>-8</math> (°C)</p>	M1   A1	FT 'their $-56$ ' from (b)(i)  On FT allow a rounded or truncated answer Allow a correctly rounded or truncated answer, to 1d.p. for '(their $-56$ ' + $-16) \div 9$ ' to imply M1 A1
5(c)(i) $20 \times (8.6 (\pm 0.2))$  <p style="text-align: center;"><math>172 (\pm 4 \text{ m})</math></p>	M1  A1	Do not award from sight of an incorrect evaluation of 'their $8.6$ ' $\times 20$
5(c)(ii) $232^\circ \pm 2^\circ$	B1	

Unit 1: Intermediate Tier	Mark	Comments																																				
6(a)(i) (£) 70	B2	B1 for any one of the following: <ul style="list-style-type: none"> <li>• use of (£)2010</li> <li>• use of (£)1940</li> </ul>																																				
6(a)(ii) Answer in the inclusive range (£)1700 to (£)1780	B1	Allow answers given as a range provided 'their range' is inclusively within the required range																																				
<p>6(b) (Total area of the driveway)</p>  <ul style="list-style-type: none"> <li>• <math>\frac{1}{2} \times (10 - 7) \times (2 + 6) + 2 \times 7</math></li> <li>• <math>\frac{1}{2} \times 3 \times 8 + 2 \times 7 \quad (= 12 + 14)</math></li> </ul>  <ul style="list-style-type: none"> <li>• <math>\frac{1}{2} \times 2 \times (7 + 10) + \frac{1}{2} \times 6 \times (10 - 7)</math></li> <li>• <math>\frac{1}{2} \times 2 \times 17 + \frac{1}{2} \times 6 \times 3 \quad (= 17 + 9)</math></li> </ul>  <ul style="list-style-type: none"> <li>• <math>\frac{1}{2} \times (10 - 7) \times (6 - 2) + 2 \times 7 + 2 \times 3</math></li> <li>• <math>\frac{1}{2} \times 3 \times 4 + 2 \times 10 \quad (= 6 + 20)</math></li> </ul>  <ul style="list-style-type: none"> <li>• <math>6 \times 10 - \frac{1}{2} \times (6 - 2) \times (7 + 10)</math></li> <li>• <math>6 \times 10 - \frac{1}{2} \times 4 \times 17 \quad (= 60 - 34)</math></li> </ul> <p style="text-align: right;">26 (m<sup>2</sup>)</p> <p>Cost in the inclusive range (£)1780 to (£)1860</p>	M2	<p>M1 for one of the following appropriate areas:</p> <ul style="list-style-type: none"> <li>• <math>\frac{1}{2} \times (10 - 7) \times (2 + 6)</math> (= 12m<sup>2</sup> area of trapezium)</li> <li>• <math>\frac{1}{2} \times 2 \times (7 + 10)</math> (= 17m<sup>2</sup> area of trapezium)</li> <li>• <math>\frac{1}{2} \times 6 \times (10 - 7)</math> (= 9m<sup>2</sup> area of a triangle)</li> <li>• <math>\frac{1}{2} \times (10 - 7) \times (6 - 2)</math> (= 6m<sup>2</sup> area of the triangle)</li> <li>• <math>\frac{1}{2} \times (6 - 2) \times (7 + 10)</math> (= 34m<sup>2</sup> area 'extra' trapezium)</li> </ul> <p>A1 CAO</p> <p>B1 FT '20 ≤ their derived composite <b>area</b> ≤ 30' for a suitable cost from the scatter diagram, within a range (shown below); must be for a composite area</p> <p>Do not FT from the perimeter or with the missing side, 25(m)</p> <p>Allow an answer in a range, provided 'their range of answers' is inclusively within the stated range</p> <p>On FT cost in the inclusive range:</p> <table border="1" data-bbox="858 1534 1468 1915"> <thead> <tr> <th>Area (m<sup>2</sup>)</th> <th>Least estimated cost (£)</th> <th>Greatest estimated cost (£)</th> </tr> </thead> <tbody> <tr><td>20</td><td>1410</td><td>1460</td></tr> <tr><td>21</td><td>1460</td><td>1510</td></tr> <tr><td>22</td><td>1520</td><td>1570</td></tr> <tr><td>23</td><td>1590</td><td>1650</td></tr> <tr><td>24</td><td>1650</td><td>1710</td></tr> <tr><td>25</td><td>1700</td><td>1780</td></tr> <tr><td><b>26</b></td><td><b>1780</b></td><td><b>1860</b></td></tr> <tr><td>27</td><td>1850</td><td>1930</td></tr> <tr><td>28</td><td>1920</td><td>2010</td></tr> <tr><td>29</td><td>1970</td><td>2060</td></tr> <tr><td>30</td><td>2030</td><td>2130</td></tr> </tbody> </table>	Area (m <sup>2</sup> )	Least estimated cost (£)	Greatest estimated cost (£)	20	1410	1460	21	1460	1510	22	1520	1570	23	1590	1650	24	1650	1710	25	1700	1780	<b>26</b>	<b>1780</b>	<b>1860</b>	27	1850	1930	28	1920	2010	29	1970	2060	30	2030	2130
Area (m <sup>2</sup> )	Least estimated cost (£)	Greatest estimated cost (£)																																				
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27	1850	1930																																				
28	1920	2010																																				
29	1970	2060																																				
30	2030	2130																																				

Unit 1: Intermediate Tier	Mark	Comments
6(c) (Repair of 23m <sup>2</sup> driveway cost £) 0.4 × 1590 to 0.4 × 1650	B1	
'No' unambiguously stated or implied <b>AND</b> a <u>correctly evaluated</u> 40% cost that will be in the range (£)636 to (£)660	B1	Do not award if 'No' is based on further working, such as 60% evaluated rather than 40%
6(c) <i>Alternative method e.g.</i> <ul style="list-style-type: none"> <li>40% is (£)575 so 100% is 2.5 × 575 (= £1437.50)</li> <li>40% is (£)600 so 100% is 2.5 × 600 (= £ 1500)</li> </ul>	B1	
'No' unambiguously stated or implied <b>AND</b> a correctly evaluated 100% <b>AND</b> shows less than needed, e.g. a reading from the diagram £1590 to £1650 (22.8m <sup>2</sup> for £1600)	B1	
7(a) B and H in either order	B2	B1 for either B or H selected
7(b)(i) $\frac{42-30}{30} (\times 100)$ or $\frac{42}{30} (\times 100) - 1 (\times 100)$	M1	Or full reverse method, e.g. <ul style="list-style-type: none"> <li>20% of £30 is 30 ÷ 5 = £6, with either 6 × 2 = (£)12 or 6 × 7 = (£)42</li> <li>10% of £30 is 30 ÷ 10 = £3, with either 3 × 4 = (£)12 or 3 × 14 = (£)42</li> </ul>
40 (%)	A1	Allow an answer of £40 from correct working  If no marks, award SC1 for an answer of 140(%)
7(b)(ii) (Percentage profit is) $\frac{9 \times 42 - 10 \times 30}{10 \times 30} (\times 100)$ or $\frac{9 \times 12 - 30}{10 \times 30} (\times 100)$ or $\frac{9 \times 42}{10 \times 30} (\times 100) - 1 (\times 100)$ or $\frac{378}{300} (\times 100) - 1 (\times 100)$ or 1.26 (× 100) – 1 (× 100) or equivalent	M2	Allow a reverse method of finding percentages of 300 used, these percentages must be correct and when added (or subtracted) <u>could</u> lead to an answer of 26% e.g. (2 × 10% =) 20% of 300 is 60 and 6% of 300 is 18
26 (%) <b>AND</b> states 'profit'	A2	M1 for any one of the following: <ul style="list-style-type: none"> <li>(difference between sales and costs) 9 × 42 – 10 × 30 (= 378 – 300)</li> <li>(sales) (£) 378 <b>AND</b> (cost) (£) 300</li> <li>(difference between sales and costs) (£) 78</li> </ul> Mark final answer A1 for any one of the following: <ul style="list-style-type: none"> <li>26(%)</li> <li><math>\frac{78}{300} (\times 100)</math> or equivalent</li> <li><math>\frac{378}{300} \times 100 = 126 (\%)</math></li> <li><math>\frac{378}{300} = 1.26</math></li> <li>(<u>'their 9×42' – 10 × 30</u>) × 100 correctly evaluated 10 × 30 and given as a percentage, allow if an error in the decimal part of their answer</li> </ul>
7(b)(iii) 8	B1	

Unit 1: Intermediate Tier	Mark	Comments
8(a)(i) $200 - 80$ or $90 + 30$ 120 (customers)	M1 A1	
8(a)(ii) 32 seconds	B1	
8(a)(iii) $\frac{200-170}{200}$ or $\frac{30}{200}$ or $\frac{15}{100}$ $\frac{3}{20}$	M1 A1	Award M1 for 0.15 or 15% Only ignore further working if written as 0.15 or 15% If no marks, award SC1 for an answer of $\frac{17}{20}$ (from 40 seconds or less)
8(b)(i) 36	B1	
8(b)(ii) $46 - 20$ 26	M1 A1	Allow 20 – 46
8(c) 'No' unambiguously stated or implied AND a reason, e.g. 'upper quartile is higher this year' '75% reading higher this year' 'interval was 37 (or 38) to 50 seconds last year, this year it is 46 to 50 seconds'	E1	Do not ignore incorrect values for the upper quartiles given, E0 if 'upper quartile' or '75%' stated with incorrect upper quartile readings  Allow 'No' with a reason, e.g. '(last year) 38, (this year) 46' '(last year) 37.(...), (this year) 46'  Do not accept, e.g. 'range greater this year' 'lower quartile is lower this year' 'median higher this year' 'customers still waiting at 50 seconds'

Unit 1: Intermediate Tier	Mark	Comments
9(a)(i) $1 \times 10^5$	B1	
9(a)(ii) A suitable calculation, including an <u>appropriate</u> approximation, e.g. $\frac{3\,100\,000}{21\,000}$ or $\frac{3\,100\,000}{20\,000}$ or $\frac{3\,000\,000}{20\,000}$ or $\frac{3\,000\,000}{21\,000}$ or equivalent  Answer in the range 142 (people/km <sup>2</sup> ) to 155 (people/km <sup>2</sup> )	M2          A1	Place value must be correct Must include an approximation  M1 for the idea to divide (in the correct order), that may also include one place value error, e.g. $\frac{3.1\,million}{20\,735}$ , $\frac{31\,000\,000}{20\,000}$ , $\frac{3\,100\,000}{20\,700}$  ISW. Allow 142.8, 142.9 and 143 rounded to 140 Accept equivalents, e.g. 150 written as $1.5 \times 10^2$
9(b) Idea that 360 000 is 120%  360 000 $\div$ 1.2 or equivalent 300 000 (people)	B1   M1 A1	Accept from sight of trial to increase 'their value' by 20% provided 'their value' <360 000  Award of M1 also implies previous B1
9(c) (Length) $6.6 \div (4.2 \div 1.4)$ or $6.6 \div 3$ or equivalent Length 2.2 (cm)  (Height) $4.2 \times (9.9 \div 6.6)$ or $4.2 \times 1.5$ or $1.4 \times (9.9 \div 2.2)$ or equivalent Height 6.3 (cm)	M1  A1  M1  A1	FT $1.4 \times (9.9 \div \text{'their derived length'})$  Note: Length (from $9.9 - 6.6 =$ ) 3.3(cm) M0 A0 Height (from $1.4 \times (9.9 \div 3.3) =$ ) 4.2(cm) M1 A1 (FT)  Allow answers reversed in the answer space
9(c) <u>Alternative method</u> (Height) $4.2 \times (9.9 \div 6.6)$ or $4.2 \times 1.5$ or equivalent Height 6.3 (cm)  (Length) $6.6 \div (4.2 \div 1.4)$ or $6.6 \div 3$ or $9.9 \div (6.3 \div 1.4)$ or equivalent Length 2.2 (cm)	M1  A1  M1  A1	FT $9.9 \div (\text{'their derived height'} \div 1.4)$  Allow answers reversed in the answer space



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# **GCSE MARKING SCHEME**

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**SUMMER 2024**

**GCSE  
MATHEMATICS – NUMERACY  
UNIT 2 – INTERMEDIATE TIER  
3310U40-1**

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## About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

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# WJEC GCSE MATHEMATICS - NUMERACY

## SUMMER 2024 MARKING SCHEME

Unit 2: Intermediate Tier	Mark	Comments								
<p>1. (Amount needed to save after next week)                      (£) <math>510 - 165</math> or (£) <math>510 - (95 + 70)</math>                      or (£) <math>510 - 95 - 70</math> (=£345)</p> <p>(Amount to save per week £) <math>\div 12</math>                      (£) 28.75</p>	<p>M2</p> <p>m1</p> <p>A1</p>	<p>May be seen in stages                      Allow missing brackets provided not contradicted in further working                      M1 for sight of any one of</p> <ul style="list-style-type: none"> <li>• <math>510 - 95</math> (= £415)</li> <li>• <math>510 - 70</math> (= £440)</li> </ul> <p>Depends on at least M1 previously awarded</p> <p>CAO. ISW                      FT provided at least 2 marks previously awarded</p> <ul style="list-style-type: none"> <li>• FT from M1 m1 for A1:                             <ul style="list-style-type: none"> <li>○ <math>415 \div 12 = (\pounds)34.58(333\dots)</math> or (£)34.59</li> <li>○ <math>440 \div 12 = (\pounds)36.66(666\dots)</math> or (£)36.67</li> </ul> </li> <li>• FT from M2 m0 for A1:                             <ul style="list-style-type: none"> <li>○ <math>345 \div 13 = (\pounds)26.53(8\dots)</math> or (£)26.54</li> <li>○ <math>345 \div 11 = (\pounds)31.36(36\dots)</math> or (£)31.37</li> </ul> </li> </ul> <p>If no marks, award any one of the following:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">SC2</td> <td>(£)28.75 &lt; answer ≤ (£)29, from supporting working, e.g. <math>12 \times 29 + 95 + 70 = (\pounds)513</math></td> </tr> <tr> <td style="text-align: center;">SC1</td> <td>(£)28.75 &lt; unsupported answer ≤ (£)29</td> </tr> <tr> <td style="text-align: center;">SC1</td> <td>answer (£)13.75 from <math>165 \div 12</math></td> </tr> <tr> <td style="text-align: center;">SC1</td> <td>answer (£)42.50 from <math>510 \div 12</math></td> </tr> </table>	SC2	(£)28.75 < answer ≤ (£)29, from supporting working, e.g. $12 \times 29 + 95 + 70 = (\pounds)513$	SC1	(£)28.75 < unsupported answer ≤ (£)29	SC1	answer (£)13.75 from $165 \div 12$	SC1	answer (£)42.50 from $510 \div 12$
SC2	(£)28.75 < answer ≤ (£)29, from supporting working, e.g. $12 \times 29 + 95 + 70 = (\pounds)513$									
SC1	(£)28.75 < unsupported answer ≤ (£)29									
SC1	answer (£)13.75 from $165 \div 12$									
SC1	answer (£)42.50 from $510 \div 12$									
<p>2(a)(i) <math>133 \times 8</math>                      1064 (miles)</p>	<p>M1</p> <p>A1</p>	<p>Mark final answer. Allow 1064 km</p>								
<p>2(a)(ii) <math>8 \times 60</math>                      480 (mph)</p>	<p>M1</p> <p>A1</p>	<p>FT from (a)(i) <math>60 \times</math> 'their 1064' <math>\div 133</math>                      or 'their 1064' <math>\div \frac{133}{60}</math> or 'their 1064' <math>\div 2.2(166\dots)</math></p> <p>Allow A1 for <math>479 \text{ (mph)} &lt; \text{answer} \leq 483.64 \text{ (mph)}</math> from <math>1064 \div 2.2(1666\dots)</math> rounded or truncated to at least 1 d.p. or similar for a correctly evaluated 'their 1064' <math>\div 2.2(166\dots)</math></p>								
<p>2(b) <math>55 \times 40 \times 23</math>                      50 600 (cm<sup>3</sup>) or 50 600 ml or 50.6 litres</p> <p>Unambiguously implies 'Yes' with one of the following:</p> <ul style="list-style-type: none"> <li>• (48 litres =) 48 000 cm<sup>3</sup></li> <li>• 50.6 (litres)</li> <li>• a suitable appropriate statement, e.g. '50 litres is more than 48 litres'</li> </ul>	<p>M1</p> <p>A1</p> <p>E1</p>	<p>FT from M1 A0 provided appropriate conclusion and conversion is shown                      Allow 'Yes' with clear <b>use of</b> 1 litre = 1000 cm<sup>3</sup>, e.g.</p> <ul style="list-style-type: none"> <li>• (48 litres is less than) 50(.6 litres)</li> <li>• 50(.6 litres is greater than 48 litres)</li> <li>• 50 000 (cm<sup>3</sup>) is greater than 48 000 (cm<sup>3</sup>)</li> </ul>								

Unit 2: Intermediate Tier	Mark	Comments
2(c) a = 43(°)	B1	
b = 137(°)	B1	FT b = 180 - 'their a', provided 'their b' > 90 and 'their b' ≠ 112
c = 112(°)	B1	FT 360 – (68 + 'their a' + 'their b'), provided: <ul style="list-style-type: none"> <li>• 112 &lt; 'their a' + 'their b' &lt; 202</li> <li>• c ≠ 137</li> <li>• their c' ≠ 'their b'</li> </ul>
d = 112(°)	B1	FT d = 'their c', provided 90 < 'their c' < 180

3. Select the method to give the best mark:

Method using £		OR	Method using \$	
Camera Fox	(62.95 + 3.90 =) (£)66.85 B1		(62.95 + 3.90) × 1.25 or (£)66.85 × 1.25 or 62.95 × 1.25 + 3.90 × 1.25 M1 (\$83.56(25) or (78.69 + 4.88 = \$)83.57 Allow an answer in the range (\$83.55 to (\$83.57 A1	
US Camera Geek	81.20 ÷ 1.25 M1 (£)64.96 A1		(\$81.20 given)	
Sure Camera	75 – 75 × 0.14 or 75 – 10.50 or 75 × (1 – 0.14) M1 (£)64.50 A1		(75 – 75 × 0.14) × 1.25 or 64.50 × 1.25 or 75 × (1 – 0.14) × 1.25 M2 (\$80.62(5) or (\$80.63 A1	
Conclusion 'Sure Camera'	Costs 66.85, 64.96 and 64.50 WITH incorrect conclusion or no conclusion penalise -1		Costs in dollars correct WITH incorrect conclusion or no conclusion penalise -1	
<b>OR method using £ and \$</b>				
	£		\$	
Camera Fox	(62.95 + 3.90 =) (£)66.85 B1			
US Camera Geek			(\$81.20 given)	
Sure Camera	75 – 75 × 0.14 M1 (£)64.50 A1	or	(75 – 75 × 0.14) × 1.25 M2 (\$80.62(5) or (\$80.63 A1	
Conclusion	Costs (£)66.85 with (£)64.50 and (\$80.62(5) (or (\$80.63) AND conclusion 'Sure Camera' A1			

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 explanations and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul>
Writing	W1	For W1, candidates will be expected to: <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc.</li> </ul>

Unit 2: Intermediate Tier	Mark	Comments
<p>4.</p> <p>(Number of kWh =) <math>138 \times 39.5 \times 1.02264 \div 3.6</math>            (Cost of gas = Number of kWh) <math>\times 0(. )12</math></p> <p>(£)185.76 to (£)185.82 or 18576(p) to 18582(p)</p> <p>(Standing charge <math>30 \times (0.)32 =</math>) (£)9.6(0) or 960(p)</p> <p>(Total of gas and standing charge)            *(£)195.36 to (£)195.42 or 19536(p) to 19542(p)</p> <p>(Total including VAT =)  <math>1.05 \times 195(. )36</math> to <math>1.05 \times 195(. )42</math></p> <p>*(£)205.12 to (£)205.19(1)            or 20512(p) to 20519(.1p)</p>	<p>M1 m1</p> <p>A1</p> <p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p><u>Penalise incorrect units -1 only on first occurrence, by withholding A or B mark, not M marks</u></p> <p>(= 1548.4474 kWh)</p> <p>(1548.4474 <math>\times</math> 0.12 = £185.813688)</p> <p>CAO</p> <p>FT 'their derived cost of gas' + 'their <math>30 \times (0.)32</math>' correctly evaluated, provided 'their derived cost of gas' <math>\neq</math> 'their <math>138 \times 39.5 \times 1.02264 \div 3.6</math>' or 1548.4474 kWh            May be implied in later working</p> <p>FT 'their derived total cost of gas + 'their standing charge'</p> <p>ISW further rounding, e.g. (£)205, (£)205.20</p> <p>If final B0 B0 M0 A0, award SC1 for correctly evaluated final answer of <math>1.05 \times</math> 'derived cost of gas' having omitted the standing charge, provided 'their derived cost of gas' <math>\neq</math> 'their <math>138 \times 39.5 \times 1.02264 \div 3.6</math>' or 1548.4474 kWh</p> <p><i>*Allow answers in these ranges that may include unseen rounding or truncation from a previously written value</i></p>
<p>4. <u>Alternative method: Gas per day</u></p> <p>(Number of kWh =) <math>138 \times 39.5 \times 1.02264 \div 3.6</math>            (Number of kWh per day) <math>\div 30</math>            (Cost of gas per day) <math>\times 0(. )12</math></p> <p>(Cost of gas per day =) (£)6.19(...) or 619(...p)</p> <p>(Total of gas and standing charge)  <math>6.51(...)</math> or <math>651(...p)</math></p> <p>(Total including VAT =)  <math>1.05 \times 6.51(...)</math> <math>\times 30</math></p> <p>*(£)205.12 to (£)205.19(1)            or 20512(p) to 20519(.1p)</p>	<p>M1 m1 m1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p><u>Penalise incorrect units -1 only on first occurrence, by withholding A or B mark, not M marks</u></p> <p>(= 1548.4474 kWh)            (= 51.6149133...kWh)</p> <p>CAO</p> <p>FT 'their derived cost of gas per day' + <math>(0.)32</math> correctly evaluated            May be implied in later working</p> <p>(= <math>6.83(94...)</math> <math>\times 30</math> or <math>6.84 \times 30</math>)            FT 'their derived cost of gas per day + <math>(0.)32</math>, provided 'their derived cost of gas' <math>\neq</math> 'their <math>138 \times 39.5 \times 1.02264 \div 3.6</math>' or 1548.4474 kWh</p> <p>ISW further rounding, e.g. (£)205, (£)205.20</p> <p>If final B0 M0 A0, award SC1 for correctly evaluated final answer of <math>1.05 \times</math> 'derived cost of gas per day' <math>\times 30</math> having omitted the standing charge, provided 'their cost of gas' <math>\neq</math> 'their <math>138 \times 39.5 \times 1.02264 \div 3.6</math>' or 1548.4474 kWh</p> <p><i>*Allow answers in these ranges that may include unseen rounding or truncation from a previously written value</i></p>

Unit 2: Intermediate Tier	Mark	Comments
5(a) $\frac{247}{400}$	B2	Mark final answer B1 for sight of $\frac{988}{1600}$ or $\frac{494}{800}$ If no marks, award SC1 for a final answer of $\frac{153}{400}$
5(b) $18000 \times 8 \div 5$ or $18000 \times 1.6$ or equivalent  28800 (km)	M1  A1	Accept use of $\times 1.6$ to $\times 1.613$ or $\div 0.62$ to $\div 0.625$  Also accept answers in the range 28960 (km) to 28980 (km)
5(c) (Cost of tarmac) $1600 \times 23 \times 0.035 \times 250$  (£) 322 000	M2  A1	M1 for a product including any 3 of these 4 values Allow M1 for <ul style="list-style-type: none"> <li>• <math>(1600 \times 0.035 \times 250 =)</math> 14 000</li> <li>• <math>(1600 \times 23 \times 250 =)</math> 9 200 000</li> <li>• <math>(1600 \times 23 \times 0.035 =)</math> 1288</li> <li>• <math>(23 \times 0.035 \times 250 =)</math> 201.25</li> </ul> A1 CAO If no marks, award SC1 for an unsupported answer with leading digits 322 and all other digits zero e.g. 32 200 or 3 220 000  If no marks, award either <ul style="list-style-type: none"> <li>• SC2 for <math>(988 \times 23 \times 0.035 \times 250 =)</math> (£)198 835 or</li> <li>• SC1 for <math>(988 \times 23 \times 0.035 =)</math> 795(.34 m<sup>3</sup>)</li> </ul>
5(d)  (2009 to 2014) $(100 \times) \frac{6.40-5.40}{5.40}$ or $\frac{1}{5.40}$ or $\frac{6.40}{5.40}$ (- 1)  (2004 to 2009) $(100 \times) \frac{5.40-4.60}{4.60}$ or $\frac{0.80}{4.60}$ or $\frac{5.40}{4.60}$ (- 1)  Choice of '2009 to 2014' <b>AND</b> 18.5(.... %) or 19(%) <b>AND</b> sight of 17(.39...%) or 17.3 (%) or 17.4 (%) or 1.17(...) or 117.(...) or 0.17(...) (for 2004 to 2009)	M1  M1  A2	Ignore any working for '2014 to 2019' Accept working in £ or p consistently  Answer space takes precedence Allow percentage increase given as 18(%)  Award M mark as well as A mark for a correct percentage from a 'reverse percentage method'  A1 for sight of any of the following: <ul style="list-style-type: none"> <li>• (2009 to 2014) 18(%), 18.5(.... %) or 19(%)</li> <li>• (2004 to 2009) 17(.39...%) or 17.3(%) or 17.4 (%)</li> <li>• 1.18(5...) or 1.19 <b>and</b> 1.17(...)</li> <li>• 118(.5...) or 119 <b>and</b> 117.(...)</li> <li>• 0.18(5...) or 0.19 <b>and</b> 0.17(...)</li> </ul> <i>Alternative second stage method:</i> If M1 A1 awarded for 2004 to 2009, also award M1 for (2009 2014) $1.1739 \times 5.40 = (\text{£})6.339 (< 6.40)$  If M1 A1 awarded for 2009 to 2014, also award M1 for (2004 2009) $1.185... \times 4.60 = 5.451(8...) (>5.40)$ , with A1 for 18.5...(%) given on the answer line

Unit 2: Intermediate Tier	Mark	Comments
6(a)(i) 18 to 24 hours	B1	
6(a)(ii) 97	B1	
6(a)(iii) 13	B1	
6(a)(iv) States or unambiguously implies 'No' with a reason, e.g. 'no people in group 0 to 6 hours'	E1	<p>Allow 'No' with e.g. 'the point before 6 hours is at zero'</p> <p>Do not allow 'Can't tell' with e.g. 'it is grouped data'</p> <p>Do not accept "No' with e.g. 'it is grouped data' (unless explaining why)</p> <p>'there is no point at 6'</p> <p>'6 hours has a frequency of 0'</p> <p>'it does not match a group of people'</p> <p>'the first point is at 0 and the second one is at 20'</p> <p>'the first plot is at 20'</p> <p>'the first plot is at 9 hours'</p> <p>'the first plot above 0 is at 9 hours'</p> <p>'there is no information at 6 hours, it starts at 9 hours'</p> <p>'the shortest time is 9 hours'</p>
<p>6(b) Sight of 22.5, 25.5, 29.5 and 31.5 (mm)</p> <p>22.5 + 25.5 + 29.5 + 31.5 or 22+25+29+31 + 4 × 0.5 or equivalent</p> <p>109 (mm)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Award B1 for sight of <math>4 \times 0.5</math> in an appropriate calculation</p> <p>Allow 0.4999(...) for 0.5, must clearly be a recurring 9 digit</p> <p>If B0, FT provided unambiguously chosen:  <math>22 &lt; \text{'their 22.5'} \leq 23</math>, <math>25 &lt; \text{'their 25.5'} \leq 26</math>,  <math>29 &lt; \text{'their 29.5'} \leq 30</math>, and <math>31 &lt; \text{'their 31.5'} \leq 32</math>,</p> <p>CAO. Ignore incorrect units given</p> <p>Ignore any working for least possible thickness also given, e.g. <math>21.5 + 22.5 + 28.5 + 30.5 = 105</math></p>

Unit 2: Intermediate Tier	Mark	Comments
<p>7(a) Method <b>not directly</b> working with a stated or omitted number of hours difference</p> $0.324 \times 8 \times (10 \text{ or } 12) \times 7 \times 80 \div 1000$ $0.324 \times 8 \times (12 \text{ or } 10) \times 7 \times 80 \div 1000$ <p style="text-align: center;"><b>with the intention to subtract</b></p> <p>(Saving is 17.418... – 14.515...=)      (£) 2.90</p>	<p>M3</p> <p>m1</p> <p>A1</p>	<p>Methods may be shown in stages or be embedded Use this method if 2 separate numbers of hours are used, which may not be correct, i.e. ≠12 and ≠10, with or without indication of subtraction</p> <p>Penalise every additional <b>spurious</b> term by reducing the count of correct terms by 1*</p> <p>Allow '× 32.4' for '× 0.324' M2 for any 4 or 5 correct terms* M1 for any 3 correct terms*</p> <p>Must be an indication of the intention to subtract, in either order <b>FT from 5 (or 6) consistent correct terms</b> for use of</p> <ul style="list-style-type: none"> <li>the other value 10 or 12 respectively</li> <li>'their number of hours' are 13 <b>and</b> 11 (incorrect)</li> </ul> <p>Award m0 if inconsistent, i.e. not an equal number of <b>consistent correct terms*</b> between the expressions. Mark 'their better stated calculation' first if both are given</p> <p>CAO All working must be checked, do not award 5 marks for £2.90 from incorrect working.</p>
<p><i>Alternative method:</i> Method <b>directly</b> working with a stated or omitted number of hours difference</p> $0.324 \times 8 \times 2 \times 7 \times 80 \div 1000$ <p>(Saving is)      (£) 2.90</p>	<p>M4</p> <p>A1</p>	<p><i>Methods may be shown in stages or be embedded Use this method if a single number of hours is used, which may not be correct, i.e. ≠2, or if the number of hours is omitted</i></p> <p><i>Do not allow 2 hours as a correct term from incorrect working, e.g. 13 – 11 = 2</i></p> <p><i>Penalise every additional <b>spurious</b> term by reducing the count of correct terms by 1*</i></p> <p><i>Allow '× 32.4' for '× 0.324' M3 for any 5 correct terms* M2 for any 4 correct terms* M1 for any 3 correct terms*</i></p> <p>CAO <i>All working must be checked, do not award 5 marks for £2.90 from incorrect working.</i></p>

Unit 2: Intermediate Tier	Mark	Comments
<p>7(b) Height = <math>\tan 68^\circ \times 3.3</math> or height = <math>\frac{\sin 68^\circ \times 3.3}{\sin(90 - 68)^\circ}</math></p> <p>8.167... (m) or 8.17 (m) or 8.2 (m)</p>	<p>M2</p> <p>A1</p>	<p>Or alternative correct full method, isolating height</p> <p>M1 for <math>\tan 68^\circ = \text{height} / 3.3</math> or <math>\frac{\text{height}}{\sin 68^\circ} = \frac{3.3}{\sin(90 - 68)^\circ}</math> or equivalent</p> <p>Allow 8(m), 8.1(m) 8.16(m) from correct working</p>
<p>8(a) Midpoints 1, 4, 7, 11, 16</p> <p><math>1 \times 8 + 4 \times 12 + 7 \times 20 + 11 \times 4 + 16 \times 6</math>  <math>(= 8 + 48 + 140 + 44 + 96)</math>  <math>(= 336)</math></p> <p><math>\div 50</math></p> <p>6.72 or 6.7 (walks)</p>	<p>B1</p> <p>M1</p> <p>m1</p> <p>A1</p>	<p>FT 'their midpoints' provided at least 4 lie within the appropriate group, including bounds throughout</p> <p>Use of lower bounds gives 276</p> <p>Use of upper bounds gives 396</p> <p>Allow rounded to 7 (walks) from appropriate working</p> <p>Use of lower bounds gives 5.5(2 walks) or 6 (walks)</p> <p>Use of upper bounds gives 7.9(2 walks) or 8 (walks)</p>
<p>8(b) 06(:)53 or 6(:)53 a.m.</p>	<p>B1</p>	<p>Allow 06(:)53 a.m. or 6(:)53</p> <p>Do not accept (0)6(:)53 p.m.</p>

Unit 2: Intermediate Tier	Mark	Comments
8(c) $(\text{Height})^2 = 7.6^2 - (18.8 - 12.6)^2$ or $(\text{Height})^2 = 7.6^2 - 6.2^2$  or $\cos^{-1}\left(\frac{18.8-12.6}{7.6}\right) = 35(.3345\dots)^\circ$ and $\sin 35(.33\dots)^\circ = \frac{\text{Height}}{7.6}$ or $\tan 35(.33\dots)^\circ = \frac{\text{Height}}{6.2}$	M2	M1 for sight of $18.8 - 12.6$ with <ul style="list-style-type: none"> <li>any attempt to use Pythagoras' Theorem (including summing rather than subtraction)</li> <li><math>\cos^{-1}\left(\frac{18.8-12.6}{7.6}\right) = 35(.33\dots)^\circ</math> and an attempt to use sine or tan</li> </ul>
$\text{Height}^2 = 19.32$ or $(\text{Height} = ) \sqrt{19.32}$ or $(\text{Height} = ) 7.6 \times \sin 35(.33\dots)^\circ$ or $(\text{Height} = ) 6.2 \times \tan 35(.33\dots)^\circ$	A1	
$(\text{Height} = ) 4.39(54\dots \text{ m})$ or $4.4(\text{m})$	A1	Do not allow $4.3(\text{m})$ from premature rounding of $35.3345\dots^\circ$ May be implied in further working Provided at least M2 previously awarded, FT from $\sqrt{\text{'their } 19.32\text{'}}$ provided $< 7.6$ (m)
$(\text{Volume of concrete}) \frac{1}{2} \times (12.6 + 18.8) \times 4.4 \times 50$ or $\frac{1}{2} \times 31.4 \times 4.4 \times 50$ or $\frac{1}{2} \times (18.8 - 12.6) \times 4.4 \times 50 + 12.6 \times 4.4 \times 50$ or $\frac{1}{2} \times 6.2 \times 4.4 \times 50 + 12.6 \times 4.4 \times 50$	M2	FT 'their derived 4.4' provided <ul style="list-style-type: none"> <li>'their derived 4.4' <math>&lt; 7.6</math></li> <li>'their derived 4.4' <math>\neq 6.2</math></li> <li>'their derived 4.4' <math>\neq</math> 'their <math>18.8 - 12.6</math>'</li> </ul>
$(\text{Volume of concrete})$ Answer in the range $3450$ ( $\text{m}^3$ ) to $3455$ ( $\text{m}^3$ )	A1	M1 for any one of the following: (Area of cross-section) <ul style="list-style-type: none"> <li><math>\frac{1}{2} \times (12.6 + 18.8) \times 4.4</math> (= <math>69.08</math> or <math>69.1\text{m}^2</math>)</li> <li><math>\frac{1}{2} \times (18.8 - 12.6) \times 4.4 + 12.6 \times 4.4</math> (= <math>13.64\text{m}^2 + 55.44\text{m}^2</math>)</li> </ul> (Volume cuboid) <ul style="list-style-type: none"> <li><math>12.6 \times 4.4 \times 50</math> (= <math>55.44 \times 50 = 2772 \text{m}^3</math>)</li> </ul> (Volume triangular prism) <ul style="list-style-type: none"> <li><math>\frac{1}{2} \times (18.8 - 12.6) \times 4.4 \times 50</math> (= <math>13.64 \times 50 = 682 \text{m}^3</math>)</li> </ul>
		FT from previous M2 only and 'their derived 4.4' from an attempt to use Pythagoras' Theorem or cosine followed by sine or tan  On FT from M2, allow a similar range from rounding or truncation  If previous M0 A0, award SC1 for an answer of $4867$ ( $\text{m}^3$ ) from 'their 4.4' = $6.2$



Unit 2: Intermediate Tier	Mark	Comments
9(b)(ii) 368 187 456 (km <sup>2</sup> )	B3	<p>ISW Allow appropriate rounding from correct working, such as 368 187 500 or 368 000 000 or 370 000 000</p> <p>B2 for any one of the following:</p> <ul style="list-style-type: none"> <li>• <math>8 \times 460\,234\,320 \div 10</math></li> <li>• <math>7 \times 460\,234\,320 \div 10 + 460\,234\,320 \div 10</math></li> <li>• <math>460\,234\,320 - 2 \times 460\,234\,320 \div 10</math></li> <li>• <math>(2 \times 460\,234\,320 \div 10 =) 92\,046\,864</math></li> <li>• <math>(7 \times 460\,234\,320 \div 10 =) 322\,164\,024</math></li> </ul> <p>B1 for any one of the following, including embedded in other working:</p> <ul style="list-style-type: none"> <li>• <math>460\,234\,320 \div 10</math></li> <li>• <math>(460\,234\,320 \div 10 =) 46\,023\,432</math></li> </ul> <p><i>If errors in calculating <math>1 + 7</math> or <math>1 + 2 + 7</math> are <b>seen</b>, then award B2 or B1 as appropriate e.g.</i></p> <ul style="list-style-type: none"> <li>• <math>1 + 7 = 9, 9 \times 460\,234\,320 \div 10</math> <span style="float: right;">B2</span></li> <li>• <math>9 \times 460\,234\,320 \div 10</math> <span style="float: right;">B1</span> (embedded <math>460\,234\,320 \div 10</math>)</li> </ul>



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# **GCSE MARKING SCHEME**

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**SUMMER 2024**

**GCSE  
MATHEMATICS – NUMERACY  
UNIT 1 – HIGHER TIER  
3310U50-1**

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## About this marking scheme

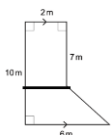
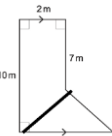
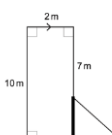
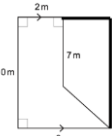
The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

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Unit 1: Higher Tier	Mark	Comments																																				
<p>2(a) (Total area of the driveway)</p>  <ul style="list-style-type: none"> <li><math>\frac{1}{2} \times (10 - 7) \times (2 + 6) + 2 \times 7</math></li> <li><math>\frac{1}{2} \times 3 \times 8 + 2 \times 7 \quad (= 12 + 14)</math></li> </ul>  <ul style="list-style-type: none"> <li><math>\frac{1}{2} \times 2 \times (7 + 10) + \frac{1}{2} \times 6 \times (10 - 7)</math></li> <li><math>\frac{1}{2} \times 2 \times 17 + \frac{1}{2} \times 6 \times 3 \quad (= 17 + 9)</math></li> </ul>  <ul style="list-style-type: none"> <li><math>\frac{1}{2} \times (10 - 7) \times (6 - 2) + 2 \times 7 + 2 \times 3</math></li> <li><math>\frac{1}{2} \times 3 \times 4 + 2 \times 10 \quad (= 6 + 20)</math></li> </ul>  <ul style="list-style-type: none"> <li><math>6 \times 10 - \frac{1}{2} \times (6 - 2) \times (7 + 10)</math></li> <li><math>6 \times 10 - \frac{1}{2} \times 4 \times 17 \quad (= 60 - 34)</math></li> </ul>	M2	<p>M1 for one of the following appropriate areas:</p> <ul style="list-style-type: none"> <li><math>\frac{1}{2} \times (10 - 7) \times (2 + 6)</math> (= 12m<sup>2</sup> area of trapezium)</li> <li><math>\frac{1}{2} \times 2 \times (7 + 10)</math> (= 17m<sup>2</sup> area of trapezium)</li> <li><math>\frac{1}{2} \times 6 \times (10 - 7)</math> (= 9m<sup>2</sup> area of a triangle)</li> <li><math>\frac{1}{2} \times (10 - 7) \times (6 - 2)</math> (= 6m<sup>2</sup> area of the triangle)</li> <li><math>\frac{1}{2} \times (6 - 2) \times (7 + 10)</math> (= 34m<sup>2</sup> area 'extra' trapezium)</li> </ul>																																				
<p style="text-align: right;">26 (m<sup>2</sup>)</p>	A1	CAO																																				
<p>Cost in the inclusive range      (£)1780 to (£)1860</p>	B1	<p>FT '20 ≤ their derived composite <b>area</b> ≤ 30' for a suitable cost from the scatter diagram, within a range (shown below); must be for a composite area</p>																																				
		<p>Do not FT from the perimeter or with the missing side, 25(m)</p> <p>Allow an answer in a range, provided 'their range of answers' is inclusively within the stated range</p> <p>On FT cost in the inclusive range:</p>																																				
		<table border="1"> <thead> <tr> <th>Area (m<sup>2</sup>)</th> <th>Least estimated cost (£)</th> <th>Greatest estimated cost (£)</th> </tr> </thead> <tbody> <tr><td>20</td><td>1410</td><td>1460</td></tr> <tr><td>21</td><td>1460</td><td>1510</td></tr> <tr><td>22</td><td>1520</td><td>1570</td></tr> <tr><td>23</td><td>1590</td><td>1650</td></tr> <tr><td>24</td><td>1650</td><td>1710</td></tr> <tr><td>25</td><td>1700</td><td>1780</td></tr> <tr><td><b>26</b></td><td><b>1780</b></td><td><b>1860</b></td></tr> <tr><td>27</td><td>1850</td><td>1930</td></tr> <tr><td>28</td><td>1920</td><td>2010</td></tr> <tr><td>29</td><td>1970</td><td>2060</td></tr> <tr><td>30</td><td>2030</td><td>2130</td></tr> </tbody> </table>	Area (m <sup>2</sup> )	Least estimated cost (£)	Greatest estimated cost (£)	20	1410	1460	21	1460	1510	22	1520	1570	23	1590	1650	24	1650	1710	25	1700	1780	<b>26</b>	<b>1780</b>	<b>1860</b>	27	1850	1930	28	1920	2010	29	1970	2060	30	2030	2130
Area (m <sup>2</sup> )	Least estimated cost (£)	Greatest estimated cost (£)																																				
20	1410	1460																																				
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29	1970	2060																																				
30	2030	2130																																				



Unit 1: Higher Tier	Mark	Comments
4(a)(i) 200 – 80 or 90 + 30 120 (customers)	M1 A1	
4(a)(ii) 32 seconds	B1	
4(a)(iii) $\frac{200-170}{200}$ or $\frac{30}{200}$ or $\frac{15}{100}$  $\frac{3}{20}$	M1 A1	Award M1 for 0.15 or 15% Only ignore further working if written as 0.15 or 15%  If no marks, award SC1 for an answer of $\frac{17}{20}$ (from 40 seconds or less)
4(b)(i) 36	B1	
4(b)(ii) 46 – 20 26	M1 A1	Allow 20 – 46
4(c) 'No' unambiguously stated or implied AND a reason, e.g. 'upper quartile is higher this year' '75% reading higher this year' 'interval was 37 (or 38) to 50 seconds last year, this year it is 46 to 50 seconds'	E1	Do not ignore incorrect values for the upper quartiles given, E0 if 'upper quartile' or '75%' stated with incorrect upper quartile readings  Allow 'No' with a reason, e.g. '(last year) 38, (this year) 46' '(last year) 37.(...), (this year) 46'  Do not accept, e.g. 'range greater this year' 'lower quartile is lower this year' 'median higher this year' 'customers still waiting at 50 seconds'

Unit 1: Higher Tier	Mark	Comments
5(a)(i) $1 \times 10^5$	B1	
5(a)(ii) A suitable calculation, including an <u>appropriate</u> approximation, e.g. $\frac{3\,100\,000}{21\,000}$ or $\frac{3\,100\,000}{20\,000}$ or $\frac{3\,000\,000}{20\,000}$ or $\frac{3\,000\,000}{21\,000}$ or equivalent  Answer in the range 142 (people/km <sup>2</sup> ) to 155 (people/km <sup>2</sup> )	M2          A1	Place value must be correct Must include an approximation  M1 for the idea to divide (in the correct order), that may also include one place value error, e.g. $\frac{3.1\,million}{20\,735}$ , $\frac{31\,000\,000}{20\,000}$ , $\frac{3\,100\,000}{20\,700}$  ISW. Allow 142.8, 142.9 and 143 rounded to 140 Accept equivalents, e.g. 150 written as $1.5 \times 10^2$
5(b) Idea that 360 000 is 120%  360 000 ÷ 1.2 or equivalent 300 000 (people)	B1   M1 A1	Accept from sight of trial to increase 'their value' by 20% provided 'their value' <360 000  Award of M1 also implies previous B1
5(c) (Length) $6.6 \div (4.2 \div 1.4)$ or $6.6 \div 3$ or equivalent Length 2.2 (cm)  (Height) $4.2 \times (9.9 \div 6.6)$ or $4.2 \times 1.5$ or $1.4 \times (9.9 \div 2.2)$ or equivalent Height 6.3 (cm)	M1  A1  M1  A1	FT $1.4 \times (9.9 \div \text{'their derived length'})$  Note: Length (from $9.9 - 6.6 =$ ) 3.3(cm) M0 A0 Height (from $1.4 \times (9.9 \div 3.3) =$ ) 4.2(cm) M1 A1 (FT)  Allow answers reversed in the answer space
5(c) <u>Alternative method</u> (Height) $4.2 \times (9.9 \div 6.6)$ or $4.2 \times 1.5$ or equivalent Height 6.3 (cm)  (Length) $6.6 \div (4.2 \div 1.4)$ or $6.6 \div 3$ or $9.9 \div (6.3 \div 1.4)$ or equivalent Length 2.2 (cm)	M1  A1  M1  A1	FT $9.9 \div (\text{'their derived height'} \div 1.4)$  Allow answers reversed in the answer space

Unit 1: Higher Tier	Mark	Comments
<p>6(a)(i)</p> <p>(Total volume =)</p> $\frac{2}{3} \times \pi \times 6^3 + \pi \times 3^2 \times 9 \quad \text{or equivalent}$ <p>(= 144<math>\pi</math>)                      (= 81<math>\pi</math>)</p> $= 225\pi \text{ (mm}^3\text{)}$	<p>M2</p> <p>A2</p>	<p>Allow values of <math>\pi</math> from 3.14 to 3.142 for M marks only</p> <p>M1 for <math>\frac{2}{3} \times \pi \times 6^3</math> (+ ....)</p> <p>Allow M1 for <math>\frac{4}{3} \times \pi \times 6^3 + \pi \times 3^2 \times 9</math> or equivalent</p> <p>CAO</p> <p>A1 for sight of 144<math>\pi</math> OR</p> <p>A1 for an answer of 369<math>\pi</math> (from use of <math>\frac{4}{3} \times \pi \times 6^3</math>) OR</p> <p>A1 for a fully correct method but with an answer of 225 (omitting <math>\pi</math>)</p> <p>If no marks awarded,</p> <p>SC2 for an answer of 1476<math>\pi</math> from <u>consistent</u> use of diameters as their radii</p> <p>OR</p> <p>SC1 for <math>\frac{2}{3} \times \pi \times 12^3 + \pi \times 6^2 \times 9</math> or equivalent</p> <p>OR</p> <p>SC1 for <math>(\frac{1}{3} \times \pi \times 6^3 + \pi \times 3^2 \times 9 = ) 153\pi</math></p>
<p>6(a)(ii) (Reduction in volume =)    9<math>\pi</math> (mm<sup>3</sup>)</p> <p>(Fractional reduction =)</p> $\frac{9(\pi)}{225(\pi)} \text{ or } \frac{1}{25} \text{ or equivalent}$	<p>B1</p> <p>B1</p>	<p>from <math>\pi \times 3^2 \times (9 - 8)</math></p> <p>OR <math>\pi \times 3^2 \times 9 - \pi \times 3^2 \times 8</math> or <math>81\pi - 72\pi</math></p> <p>Implies previous B1</p> <p>ISW</p> <p>FT 'their 225<math>\pi</math>' and 'their <math>\pi \times 3^2 \times 9 - \pi \times 3^2 \times 8</math>' and both are multiples of <math>\pi</math></p> <p>If no marks awarded,</p> <p>SC1 for a numerator of 'their 225<math>\pi</math>' - 9<math>\pi</math>, which may be embedded in a final answer of e.g. 216/225 or 24/25 if correct work seen in part (a)(i)</p> <p>Must be from a reduction of 9<math>\pi</math> in their volume. ISW</p>
<p>6(b) Complete method</p> <p>e.g. 100x = 16.111..., 1000x = 161.111... AND an attempt to subtract both sides</p> $\frac{145}{900} \text{ or } \frac{1595}{9900} \text{ or } \frac{16095}{99900} \text{ or equivalent}$ $\frac{29}{180}$	<p>M1</p> <p>A1</p> <p>A1</p>	<p>Allow A1 for</p> <p>e.g. (10x - x =) 1.45/9, (100x - x =) 15.95/99 etc</p> <p>FT from M1A0 provided at least 1 stage of simplification required</p>

Unit 1: Higher Tier	Mark	Comments
7(a)(i) Correct method to calculate a frequency density for any 2 groups Frequency densities of 4, 1.6, 1.2, 0.2	M1  A2	A1 for any 2 correct frequency densities
7(a)(ii)  Fully correct histogram drawn	B2	FT their frequency densities throughout provided they fit on the given scale B1 for at least 3 correct bars drawn
7(b)(i) Working from the left of the graph $\frac{120 - 34}{2}$ or equivalent OR (from the right) $4 + 18 + 24 + 40 - \frac{120}{2}$ or equivalent  = 26 (pupils needed from the 10-20 group)  (Median =) $(10 +) \frac{26}{40} \times 10$ or equivalent  = 16.5 (mins)	M1   A1  m1  A1	Allow use of $\frac{120+1}{2}$ for $\frac{120}{2}$ for M1A0, but final m1A1 still available  CAO FT 'their 26'  Or 16 minutes 30 seconds
7(b)(i) <u>Alternative method:</u> Working from the right of the graph $\frac{120 - 4 - 18 - 24}{2}$ or equivalent OR (from the left) $34 + 40 - \frac{120}{2}$  = 14 (people needed from the 10-20 group)  (Median =) $(20 -) \frac{14}{40} \times 10$ or equivalent  = 16.5 (mins)	M1   A1  m1  A1	Allow use of $\frac{120+1}{2}$ for $\frac{120}{2}$ for M1A0, but final m1A1 still available  CAO FT 'their 14'  Or 16 minutes 30 seconds
7(b)(ii) 20 (minutes)	B1	FT the upper limit of the group their median is in from (b)(i)



Unit 1: Higher Tier	Mark	Comments
9(a) Use of Volume = $\frac{\text{Mass}}{\text{Density}}$ (Maximum possible volume =) $\frac{155}{2.5}$ $= 62 \text{ (cm}^3\text{)}$	B1  M1  A1	FT 'their 155' provided $150 < \text{mass} \leq 160$ AND 'their 2.5' provided $2 \leq \text{density} < 3$ CAO  If no marks awarded, SC1 for use of 155 AND 2.5
9(b)(i) Identification of correct right-angled triangle $(AD^2 =) 40^2 - (12 - 2)^2$ or $(AD^2 =) 40^2 - 10^2$  $AD^2 = 1500$ OR $(AD =) \sqrt{1500}$ AND $(AD =) 10\sqrt{15} \text{ (cm)}$	B1  M1  A1	May be implied by sight of 40 AND $(12 - 2)$ or 10 in working  Sight of $AD^2 = 1500$ OR $(AD =) \sqrt{1500}$ AND $10\sqrt{15}$ need to be seen
9(b)(ii) (Total arc length =) $\frac{150 \times 2 \times \pi \times 2}{360} + \frac{210 \times 2 \times \pi \times 12}{360}$ $(= 5\pi/3 \text{ or } 1^{2/3}\pi)$ $(= 14\pi \text{ or } 42\pi/3)$  $= 15\frac{2}{3}\pi$ or $\frac{5640\pi}{360}$ or $\frac{47\pi}{3}$ (cm) or equivalent  (Total length of chain =) $20\sqrt{15} + \frac{5640\pi}{360}$ (cm) or equivalent	M2  A2  B1	Allow values of $\pi$ from 3.14 to 3.142 for M marks only  Or equivalent M1 for $\frac{150 \times 2 \times \pi \times 2}{360}$ OR $\frac{210 \times 2 \times \pi \times 12}{360}$ or equivalents  A2 CAO. Allow $15.66\pi$ , $15.67\pi$ or $15.7\pi$ A1 for any one of the following: <ul style="list-style-type: none"> <li>• <math>AB = 600\pi/360</math> or equivalent <math>(= 5\pi/3 \text{ or } 1^{2/3}\pi)</math>, allowing <math>1.66\pi</math>, <math>1.67\pi</math> or <math>1.7\pi</math></li> <li>• <math>CD = 5040\pi/360</math> or equivalent <math>(= 14\pi \text{ or } 42\pi/3)</math></li> <li>• On FT from M1 for a correct evaluation of 'their <math>\frac{150 \times 2 \times \pi \times 2}{360} + \frac{210 \times 2 \times \pi \times 12}{360}</math>' with 1 correct term, accepting similar notation possibilities as A2</li> </ul> B1 ISW Accept use of $15\frac{2}{3}\pi$ Allow use of $15.66\pi$ , $15.67\pi$ or $15.7\pi$ FT 'their $\frac{5640\pi}{360}$ ' provided at least 2 marks previously awarded  If no marks awarded, and from using $\pi \times \text{radius}$ in their calculations, i.e. using the method $2 \times 10\sqrt{15} + \frac{150 \times \pi \times 2}{360} + \frac{210 \times \pi \times 12}{360}$ SC3 for an answer of $20\sqrt{15} + \frac{5640\pi}{720}$ (cm) or equivalent, allowing use of $7.83(\dots)\pi$ OR SC2 for $\dots + \frac{5640\pi}{720}$ (cm) or equivalent, allowing use of $7.83(\dots)\pi$ OR SC1 for use of $2 \times 10\sqrt{15} + \frac{150 \times \pi \times 2}{360} + \frac{210 \times \pi \times 12}{360}$

Unit 1: Higher Tier	Mark	Comments																		
<p>10.</p> <p>(3 +) 12</p> <p style="padding-left: 40px;"><math>\times \frac{9}{12}</math> or <math>\times 0.75</math> or equivalent</p> <p style="padding-left: 100px;"><math>\times \frac{7}{5}</math> or <math>\times 1.4</math> or equivalent</p> <p style="text-align: right;">= 15 hours 36 minutes</p>	<p>M1</p> <p>M1</p> <p>A2</p>	<p>A table method altering all 3 in the same manner at the same time is M0</p> <p>M marks may be seen in either order Allow 12 – 3 e.g. <table style="display: inline-table; border-collapse: collapse;"><tr><td style="text-align: center; padding: 0 10px;"><u>Time</u></td><td style="text-align: center; padding: 0 10px;"><u>To fill</u></td><td style="text-align: center; padding: 0 10px;"><u>Pumps</u></td></tr><tr><td style="text-align: center;">9</td><td style="text-align: center;">9/12</td><td style="text-align: center;">7</td></tr></table> or <table style="display: inline-table; border-collapse: collapse;"><tr><td style="text-align: center; padding: 0 10px;">63</td><td style="text-align: center; padding: 0 10px;">9/12</td><td style="text-align: center; padding: 0 10px;">1</td></tr></table></p> <p>FT from M0 previously awarded Must be from use of 12 or (12 × 9/12 =) 9 e.g. if this calculation is performed first <table style="display: inline-table; border-collapse: collapse;"><tr><td style="text-align: center; padding: 0 10px;"><u>Time</u></td><td style="text-align: center; padding: 0 10px;"><u>To fill</u></td><td style="text-align: center; padding: 0 10px;"><u>Pumps</u></td></tr><tr><td style="text-align: center;">16.8</td><td style="text-align: center;">(Full)</td><td style="text-align: center;">5</td></tr></table> or <table style="display: inline-table; border-collapse: collapse;"><tr><td style="text-align: center; padding: 0 10px;">1.4</td><td style="text-align: center; padding: 0 10px;">1/12</td><td style="text-align: center; padding: 0 10px;">5</td></tr></table></p> <p>CAO A1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• <math>\frac{63}{5}</math> or <math>12\frac{3}{5}</math> or 12.6 (hours) or 12 hours 36 min</li> <li>• <math>\frac{78}{5}</math> or <math>15\frac{3}{5}</math> or 15.6 (hours)</li> <li>• FT from M1M1 for their time + 3 hours correct to the nearest minute provided of equivalent difficulty</li> </ul>	<u>Time</u>	<u>To fill</u>	<u>Pumps</u>	9	9/12	7	63	9/12	1	<u>Time</u>	<u>To fill</u>	<u>Pumps</u>	16.8	(Full)	5	1.4	1/12	5
<u>Time</u>	<u>To fill</u>	<u>Pumps</u>																		
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<u>Time</u>	<u>To fill</u>	<u>Pumps</u>																		
16.8	(Full)	5																		
1.4	1/12	5																		
<p>10. <u>Alternative method 1 (using pump-hours):</u></p> <p>Sight of <math>7 \times 12</math> AND <math>7 \times 3</math></p> <p>(3 +) <math>\frac{7 \times 12 - 7 \times 3}{5}</math></p> <p style="text-align: right;">= 15 hours 36 minutes</p>	<p>B1</p> <p>M1</p> <p>A2</p>	<p>CAO A1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• <math>\frac{63}{5}</math> or <math>12\frac{3}{5}</math> or 12.6 (hours)</li> <li>• <math>\frac{78}{5}</math> or <math>15\frac{3}{5}</math> or 15.6 (hours)</li> <li>• FT from M1 for their time + 3 hours correct to the nearest minute provided of equivalent difficulty</li> </ul>																		
<p>10. <u>Alternative method 2 (using pump-hours):</u></p> <p>Sight of <math>7 \times 12</math> AND <math>2 \times 3</math></p> <p><math>\frac{7 \times 12 - 2 \times 3}{5}</math></p> <p style="text-align: right;">= 15 hours 36 minutes</p>	<p>B1</p> <p>M1</p> <p>A2</p>	<p>CAO A1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• <math>\frac{78}{5}</math> or <math>15\frac{3}{5}</math> or 15.6 (hours)</li> <li>• FT from M1 for their time correct to the nearest minute provided of equivalent difficulty</li> </ul>																		



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# **GCSE MARKING SCHEME**

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**SUMMER 2024**

**GCSE  
MATHEMATICS – NUMERACY  
UNIT 2 – HIGHER TIER  
3310U60-1**

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## About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

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**WJEC GCSE MATHEMATICS - NUMERACY**

**SUMMER 2024 MARKING SCHEME**

Unit 2: Higher Tier	Mark	Comments
1(a)(i) 18 to 24 hours	B1	
1(a)(ii) 97	B1	
1(a)(iii) 13	B1	
1(a)(iv) States or unambiguously implies 'No' with a reason, e.g. 'no people in group 0 to 6 hours'	E1	<p>Allow 'No' with e.g. 'the point before 6 hours is at zero'</p> <p>Do not allow 'Can't tell' with e.g. 'it is grouped data'</p> <p>Do not accept "No' with e.g. 'it is grouped data' (unless explaining why)</p> <p>'there is no point at 6'</p> <p>'6 hours has a frequency of 0'</p> <p>'it does not match a group of people'</p> <p>'the first point is at 0 and the second one is at 20'</p> <p>'the first plot is at 20'</p> <p>'the first plot is at 9 hours'</p> <p>'the first plot above 0 is at 9 hours'</p> <p>'there is no information at 6 hours, it starts at 9 hours'</p> <p>'the shortest time is 9 hours'</p>
<p>1(b) Sight of 22.5, 25.5, 29.5 and 31.5 (mm)</p> <p>22.5 + 25.5 + 29.5 + 31.5 or 22+25+29+31 + 4 × 0.5 or equivalent</p> <p>109 (mm)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Award B1 for sight of <math>4 \times 0.5</math> in an appropriate calculation</p> <p>Allow 0.4999(...) for 0.5, must clearly be a recurring 9 digit</p> <p>If B0, FT provided unambiguously chosen:  <math>22 &lt; \text{'their } 22.5' \leq 23</math>, <math>25 &lt; \text{'their } 25.5' \leq 26</math>,  <math>29 &lt; \text{'their } 29.5' \leq 30</math>, and <math>31 &lt; \text{'their } 31.5' \leq 32</math>,</p> <p>CAO. Ignore incorrect units given</p> <p>Ignore any working for least possible thickness also given, e.g. <math>21.5 + 22.5 + 28.5 + 30.5 = 105</math></p>

Unit 2: Higher Tier	Mark	Comments
<p>2(a) <u>Method not directly working with a stated or omitted number of hours difference</u></p> <p><math>0.324 \times 8 \times (10 \text{ or } 12) \times 7 \times 80 \div 1000</math></p> <p><math>0.324 \times 8 \times (12 \text{ or } 10) \times 7 \times 80 \div 1000</math> with the intention to subtract</p> <p>(Saving is 17.418... – 14.515...=) (£) 2.90</p>	<p>M3</p> <p>m1</p> <p>A1</p>	<p>Methods may be shown in stages or be embedded <u>Use this method if 2 separate numbers of hours are used, which may not be correct, i.e. ≠12 and ≠10, with or without indication of subtraction</u></p> <p>Penalise every additional <b>spurious</b> term by reducing the count of correct terms by 1*</p> <p>Allow '× 32.4' for '× 0.324' M2 for any 4 or 5 correct terms* M1 for any 3 correct terms*</p> <p>Must be an indication of the intention to subtract, in either order <b>FT from 5 (or 6) consistent correct terms</b> for use of</p> <ul style="list-style-type: none"> <li>the other value 10 or 12 respectively</li> <li>'their number of hours' are 13 <b>and</b> 11 (incorrect)</li> </ul> <p>Award m0 if inconsistent, i.e. not an equal number of <b>consistent correct terms*</b> between the expressions. Mark 'their better stated calculation' first if both are given</p> <p>CAO All working must be checked, do not award 5 marks for £2.90 from incorrect working.</p>
<p>2(a) <u>Alternative method:</u> <u>Method directly working with a stated or omitted number of hours difference</u></p> <p><math>0.324 \times 8 \times 2 \times 7 \times 80 \div 1000</math></p> <p>(Saving is) (£) 2.90</p>	<p>M4</p> <p>A1</p>	<p><i>Methods may be shown in stages or be embedded</i> <u>Use this method if a single number of hours is used, which may not be correct, i.e. ≠2, or if the number of hours is omitted</u></p> <p><i>Do not allow 2 hours as a correct term from incorrect working, e.g. 13 – 11 = 2</i></p> <p><i>Penalise every additional <b>spurious</b> term by reducing the count of correct terms by 1*</i></p> <p>Allow '× 32.4' for '× 0.324' M3 for any 5 correct terms* M2 for any 4 correct terms* M1 for any 3 correct terms*</p> <p>CAO All working must be checked, do not award 5 marks for £2.90 from incorrect working.</p>
<p>Organisation and communication</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><i>Organised to include labels, e.g.</i> Number of hours Total number of kWh Cost per day Cost per week</p> </div> <p>Writing</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><i>Units to include, e.g.</i> kW kWh £</p> </div>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <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 explanations and working in a way that is clear and logical</li> <li>write a conclusion that draws together their results and explains what their answer means</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>show all their working</li> <li>make few, if any, errors in spelling, punctuation and grammar</li> <li>use correct mathematical form in their working</li> <li>use appropriate terminology, units, etc.</li> </ul>

Unit 2: Higher Tier	Mark	Comments
2(b) Height = $\tan 68^\circ \times 3.3$ or height = $\frac{\sin 68^\circ \times 3.3}{\sin(90 - 68)^\circ}$  8.167... (m) or 8.17 (m) or 8.2 (m)	M2    A1	Or alternative correct full method, isolating height  M1 for $\tan 68^\circ = \text{height} / 3.3$ or $\frac{\text{height}}{\sin 68^\circ} = \frac{3.3}{\sin(90 - 68)^\circ}$ or equivalent  Allow 8(m), 8.1(m) 8.16(m) from correct working
3(a) Midpoints 1, 4, 7, 11, 16  $1 \times 8 + 4 \times 12 + 7 \times 20 + 11 \times 4 + 16 \times 6$ $(= 8 + 48 + 140 + 44 + 96)$ $(= 336)$  $\div 50$  6.72 or 6.7 (walks)	B1  M1  m1  A1	FT 'their midpoints' provided at least 4 lie within the appropriate group, including bounds throughout Use of lower bounds gives 276 Use of upper bounds gives 396  Allow rounded to 7 (walks) from appropriate working Use of lower bounds gives 5.5(2 walks) or 6 (walks) Use of upper bounds gives 7.9(2 walks) or 8 (walks)
3(b) 06(:)53 or 6(:)53 a.m.	B1	Allow 06(:)53 a.m. or 6(:)53 Do not accept (0)6(:)53 p.m.

Unit 2: Higher Tier	Mark	Comments
3(c) $(\text{Height})^2 = 7.6^2 - (18.8 - 12.6)^2$ or $(\text{Height})^2 = 7.6^2 - 6.2^2$  or $\cos^{-1}\left(\frac{18.8-12.6}{7.6}\right) = 35(.3345\dots)^\circ$ and $\sin 35(.33\dots)^\circ = \frac{\text{Height}}{7.6}$ or $\tan 35(.33\dots)^\circ = \frac{\text{Height}}{6.2}$	M2	M1 for sight of 18.8 – 12.6 with <ul style="list-style-type: none"> <li>any attempt to use Pythagoras' Theorem (including summing rather than subtraction)</li> <li><math>\cos^{-1}\left(\frac{18.8-12.6}{7.6}\right) = 35(.3345\dots)^\circ</math> and an attempt to use sine or tan</li> </ul>
$\text{Height}^2 = 19.32$ or $(\text{Height} = ) \sqrt{19.32}$ or $(\text{Height} = ) 7.6 \times \sin 35(.33\dots)^\circ$ or $(\text{Height} = ) 6.2 \times \tan 35(.33\dots)^\circ$	A1	
$(\text{Height} = ) 4.39(54\dots \text{ m})$ or $4.4(\text{m})$	A1	Do not allow 4.3(m) from premature rounding of 35.3345...° May be implied in further working Provided at least M2 previously awarded, FT from $\sqrt{\text{their } 19.32}$ provided < 7.6 (m)
$(\text{Volume of concrete}) \frac{1}{2} \times (12.6 + 18.8) \times 4.4 \times 50$ or $\frac{1}{2} \times 31.4 \times 4.4 \times 50$ or $\frac{1}{2} \times (18.8 - 12.6) \times 4.4 \times 50 + 12.6 \times 4.4 \times 50$ or $\frac{1}{2} \times 6.2 \times 4.4 \times 50 + 12.6 \times 4.4 \times 50$	M2	FT 'their derived 4.4' provided <ul style="list-style-type: none"> <li>'their derived 4.4' &lt; 7.6</li> <li>'their derived 4.4' ≠ 6.2</li> <li>'their derived 4.4' ≠ 'their 18.8 – 12.6'</li> </ul> May be seen in stages, e.g. with '× 50' in further working
$(\text{Volume of concrete})$ Answer in the range 3450 (m <sup>3</sup> ) to 3455 (m <sup>3</sup> )	A1	M1 for any one of the following: (Area of cross-section) <ul style="list-style-type: none"> <li><math>\frac{1}{2} \times (12.6 + 18.8) \times 4.4</math> (= 69.08 or 69.1m<sup>2</sup>)</li> <li><math>\frac{1}{2} \times (18.8 - 12.6) \times 4.4 + 12.6 \times 4.4</math> (= 13.64m<sup>2</sup> + 55.44m<sup>2</sup>)</li> </ul> (Volume cuboid) <ul style="list-style-type: none"> <li><math>12.6 \times 4.4 \times 50</math> (= 55.44 × 50 = 2772 m<sup>3</sup>)</li> </ul> (Volume triangular prism) <ul style="list-style-type: none"> <li><math>\frac{1}{2} \times (18.8 - 12.6) \times 4.4 \times 50</math> (= 13.64 × 50 = 682 m<sup>3</sup>)</li> </ul> FT from previous M2 only and 'their derived 4.4' from an attempt to use Pythagoras' Theorem or cosine followed by sine  On FT from M2, allow a similar range from rounding or truncation  If previous M0 A0, award SC1 for an answer of 4867 (m <sup>3</sup> ) from 'their 4.4' = 6.2



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4(b)(ii) 368 187 456 (km <sup>2</sup> )	B3	<p>ISW  Allow appropriate rounding from correct working, such as 368 187 500 or 368 000 000 or 370 000 000</p> <p>B2 for any one of the following:</p> <ul style="list-style-type: none"> <li>• <math>8 \times 460\,234\,320 \div 10</math></li> <li>• <math>7 \times 460\,234\,320 \div 10 + 460\,234\,320 \div 10</math></li> <li>• <math>460\,234\,320 - 2 \times 460\,234\,320 \div 10</math></li> <li>• <math>(2 \times 460\,234\,320 \div 10 =) 92\,046\,864</math></li> <li>• <math>(7 \times 460\,234\,320 \div 10 =) 322\,164\,024</math></li> </ul> <p>B1 for any one of the following, including embedded in other working:</p> <ul style="list-style-type: none"> <li>• <math>460\,234\,320 \div 10</math></li> <li>• <math>(460\,234\,320 \div 10 =) 46\,023\,432</math></li> </ul> <p><i>If errors in calculating <math>1 + 7</math> or <math>1 + 2 + 7</math> are <b>seen</b>, then award B2 or B1 as appropriate e.g.</i></p> <ul style="list-style-type: none"> <li>• <math>1 + 7 = 9, 9 \times 460\,234\,320 \div 10</math> <span style="float: right;">B2</span></li> <li>• <math>9 \times 460\,234\,320 \div 10</math> <span style="float: right;">B1</span></li> </ul> <p style="text-align: right;"><i>(embedded <math>460\,234\,320 \div 10</math>)</i></p>

Unit 2: Higher Tier	Mark	Comments
<p>5(a) (Number of gallons used =)</p> $\frac{36}{48} + \frac{65 \times 1\frac{24}{60}}{35} \quad \text{OR} \quad \frac{36}{48} + \frac{65 \times 1.4}{35}$ <p>(= 0.75)      (= 2.6)</p> <p style="text-align: right;">= 3.35 (gallons)</p>	<p>M3</p> <p>A1</p>	<p>Allow M2 for <math>\frac{36}{48} + \frac{65 \times 1.24}{35}</math> (= 0.75 + 2.30...) OR sight of <math>\frac{65 \times 1.4}{35}</math> or equivalent M1 for sight of <math>\frac{36}{48}</math> or sight of 0.75 provided not from incorrect work Allow M1 for sight of <math>\frac{65 \times 1.24}{35}</math> OR <math>\frac{65 \times 84}{35}</math> (=156)</p> <p>CAO Allow 3.4 (gallons) provided no incorrect work seen</p>
<p>5(b)</p> $3.35 \times 8 \div 1.75 \times 1.49$ <p style="text-align: right;">= (£)22.81(828...) or (£)22.82</p>	<p>M2</p> <p>A1</p>	<p>FT 'their 3.35 (gallons)' from (a) Allow use of the conversion 1 litre = 1.75 to 1.76 pints</p> <p>M1 for the correct use of 3.35 with any 2 terms OR M1 for <math>8 \div 1.75 \times 1.49</math> OR if one of the direct conversions from gallons to litres used as listed below, M1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• <math>3.35 \times (4.544 \text{ to } 4.572)</math></li> <li>• <math>1.49 \times (4.544 \text{ to } 4.572)</math></li> <li>• <math>3.35 \times 1.49 \times</math> 'their 4.544 to 4.572' but using a value <u>just</u> outside this range e.g. 4.6</li> <li>• <math>3.35 \div (0.2187 \text{ to } 0.22)</math></li> <li>• <math>1.49 \div (0.2187 \text{ to } 0.22)</math></li> <li>• <math>3.35 \times 1.49 \div</math> 'their 0.2187 to 0.22' but using a value <u>just</u> outside this range e.g. 0.218</li> </ul> <p>Must be from M2 Strict FT of their correct conversion between gallons and litres. Answers will be in the range (£)22.68 to (£)22.82 Allow the conversion into litres from any of the following also</p> <p style="text-align: center;"><u>1 pint = 568 to 572 ml</u>      <u>1 gallon = 4.544 to 4.572 litres</u>  <math>3.35 \times 8 \times (0.568 \text{ to } 0.572)</math>      <math>3.35 \times (4.544 \text{ to } 4.572)</math></p> <p style="text-align: center;"><u>1 litre = 0.2187 to 0.22 gallons</u>  <math>3.35 \div (0.2187 \text{ to } 0.22)</math></p>

Unit 2: Higher Tier	Mark	Comments
<p>6(a)</p> $\frac{360 - 38 \times \pi \times (54^2 - 50^2)}{360} \quad (\times 2) \quad \text{or equivalent}$ <p>(= 1168.35 to 1169.11 or 16744π/45)</p> $= 2336.7 \text{ to } 2338.21 \quad \text{or} \quad 33488\pi/45 \quad (\text{mm}^3)$ <p>(Number of C-clips =)</p> $\frac{1500000}{2336.7 \text{ to } 2338.21}$ $= 641 \text{ (C-clips)}$	<p>M2</p> <p>M1 for one of the following:</p> <ul style="list-style-type: none"> <li>• <math>\frac{360 - 38 \times \pi \times 54^2}{360} \quad (\times 2) \quad (= 8189.7 \text{ to } 8195)</math> (=13041π/5)</li> <li>• <math>\frac{360 - 38 \times \pi \times 50^2}{360} \quad (\times 2) \quad (= 7021.3 \text{ to } 7026)</math> (= 20125π/9)</li> <li>• <math>\frac{38 \times \pi \times (54^2 - 50^2)}{360} \quad (\times 2) \quad (= 137.8 \text{ to } 138)</math> (= 1976π/45)</li> </ul> <p>A1</p> <p>CAO</p> <p>If no marks yet awarded, SC1 for any one of the following</p> <ul style="list-style-type: none"> <li>• <math>\frac{360 - 38 \times \pi \times (27^2 - 25^2)}{360} \quad (\times 2) \quad (= 292 \text{ to } 292.3)</math> (= 4186π/45)</li> <li>• <math>\pi \times (54^2 - 50^2) \times 2 \quad (= 2612 \text{ to } 2614.15 \text{ or } 832\pi)</math></li> </ul> <p>M1</p> <p>FT 'their 2336.7 to 2338.21' provided at least 1 mark previously awarded</p> <p>A1</p> <p>Only FT from M2M1 or M1M1 previously awarded On FT, should be an integer obtained from the truncation of their answer</p>	<p>Accept use of values of π from 3.14 to 3.142</p> <p>Note: Accept (54<sup>2</sup> – 50<sup>2</sup>) written as (54 + 50) × (54 – 50)</p>
<p>6(a) <u>Alternative method for the first 3 marks:</u></p> $\frac{360 - 38 \times (2 \times \pi \times 54 + 2 \times \pi \times 50)}{360} \times (54 - 50) \quad (\times 2)$ $= 2336.7 \text{ to } 2338.21 \quad (\text{mm}^3)$	<p>M2</p> <p>M1 for one of the following:</p> <ul style="list-style-type: none"> <li>• <math>\frac{360 - 38 \times (2 \times \pi \times 54 + 2 \times \pi \times 50)}{360} \times (54 - 50) \times 2</math> (= 4673.4 to 4676.42 or 66976π/45)</li> <li>• <math>\frac{360 - 38 \times (\pi \times 54 + \pi \times 50)}{360} \times (54 - 50)</math> (= 584.1 to 584.6 or 8372π/45)</li> <li>• <math>\frac{38 \times (2 \times \pi \times 54 + 2 \times \pi \times 50)}{360} \times (54 - 50) \quad (\times 2)</math> (= 137.8 to 138 or 1976π/45)</li> </ul> <p>A1</p> <p>CAO</p> <p>If no marks yet awarded, SC1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• <math>\frac{360 - 38 \times (2 \times \pi \times 27 + 2 \times \pi \times 25)}{360} \times (27 - 25)</math> (= 292 to 292.3 or 4186π/45)</li> <li>• <math>\frac{(2 \times \pi \times 54 + 2 \times \pi \times 50)}{2} \times (54 - 50) \times 2</math> (= 2612 to 2614.15 or 832π)</li> </ul>	<p>Accept use of values of π from 3.14 to 3.142</p>

Unit 2: Higher Tier	Mark	Comments
<p>6(b)</p> $1500 \times \frac{\text{(number of a type of fastener made)}}{149\,000}$ <p>(List of unrounded answers) 231.5(436...), 110.7(382...), 704.6(979...), 453(.0201...)</p> <p>(Number in sample =) 231, 111, 705, 453</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>Sight of this calculation for any type of fastener Allow e.g. (C-clips) <math>\frac{15.4(\dots) \times 1500}{100}</math></p> <p>OR</p> <p>A1 for 232, 111, 705, 453 Implies the award of M1</p> <p>Award M1A1A1 for 231, 111, 705, 453 <u>provided no incorrect work seen</u></p> <p>If M1A0 awarded, A1 on FT from their unrounded answers for equivalent difficulty i.e. provided:</p> <ul style="list-style-type: none"> <li>• their correctly rounded answers sum to 1499 or 1501 AND</li> <li>• the correct numbers in the sample are given from their unrounded answers, including any decisions regarding rounding up or down AND</li> <li>• the numbers in the sample add to 1500</li> </ul>



Unit 2: Higher Tier	Mark	Comments
<p>7(c) (Area factor =) <math>1 - 0.19</math> OR <math>\frac{1}{1 - 0.19}</math>  (= 0.81) (= 1.2345...)</p> <p>(Scale factor =) <math>\sqrt{1 - 0.19}</math> OR <math>\sqrt{\frac{1}{1 - 0.19}}</math>  (= 0.9) (= 1.1(1...))</p> <p>(Length of Tanvi's map =)  <math>\sqrt{1 - 0.19} \times 33</math> OR <math>33 \div \sqrt{\frac{1}{1 - 0.19}}</math>  = 29.7 (cm)</p>	<p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Or percentage, fraction or ratio equivalent to 0.81 or 1.2345...  May be implied in further possibly incorrect working e.g. <math>33 \times 0.81</math>, <math>33 \times (1 - 0.19)</math>, <math>33 - 33 \times 0.19</math> (=26.73)</p> <p>Accept a scale factor of 10:9 or 9:10 or equivalents</p> <p>CAO  Accept an answer of 30 (cm) from correct working</p> <p>If no marks awarded,  SC1 for any one of the following:</p> <ul style="list-style-type: none"> <li><math>33 \times \sqrt{0.19}</math> (= 14.3(843...cm))</li> <li><math>33 \div \sqrt{1.19}</math> (= 30.2(510...cm))</li> </ul>
<p>7(d) Tangent drawn at time 20 minutes</p> <p>Idea of increase in <math>y \div</math> increase in <math>x</math></p> <p>Correctly evaluated gradient for their tangent  (between 0.04 and 0.1)</p> <p><math>\frac{\text{'their gradient'} \times 60}{1.6}</math> or <math>\frac{\text{'their gradient'} \times 5 \times 60}{8}</math>  or equivalent</p> <p>Correctly evaluated speed in mph for 'their gradient'  (between 1.5 and 3.75 mph)</p>	<p>M1</p> <p>m1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>An appropriate tangent resulting in a gradient between 0.04 and 0.1</p> <p>Differences need to be attempted for both  Allow m1A0 if one difference has been incorrectly calculated  An attempt may have been made to convert into miles and/or hours</p> <p>Dependent on M1m1 awarded  Allow their correctly evaluated gradient to be a fraction that may include a decimal e.g. 1.3/20  May be embedded within further work  Mark final answer</p> <p>FT 'their gradient' provided it's an increase in <math>y \div</math> increase in <math>x</math> from an attempt made at drawing a tangent at time 20 minutes  Do not award if previous incorrect attempt/s made at converting one or both differences into miles and/or hours</p> <p>Accept appropriate rounding</p>

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8(a) $5000 \times 1.006^{18}$  $= (\pounds) 5568.44(1446)$	M1  A1	If no marks awarded, SC1 for $(5000 \times 1.006^{17} =) (\pounds)5535.23(0\dots)$ or $(\pounds)5535.23$
8(b) $(1 + x)^2 - 1 = 0.04$ or equivalent  $1 + x = \sqrt{1.04}$ or equivalent $x = 0.01(980\dots)$  (Interest rate every 6 months =) 1.98 (%)	M1  m1 A1  A1	Allow a place value error in the 0.04 for at most M1m1A0A0 Accept any letter used for x  CAO
8(b) <u>Alternative method:</u> <i>i is the nominal annual rate</i> $\left(1 + \frac{i}{2}\right)^2 - 1 = 0.04$ or equivalent  $1 + \frac{i}{2} = \sqrt{1.04}$ or equivalent $i = 0.03(960\dots)$ or $3.96(0\dots)\%$  (Interest rate every 6 months =) 1.98 (%)	M1  m1 A1  A1	Allow a place value error in the 0.04 for at most M1m1A0A0 Accept any letter used for i  May be implied in further working If their final answer comes from $\sqrt{1.04} - 1$ AND $0.03(960\dots)$ or $3.96(\dots)\%$ not seen, then award this A1 for $0.01(980\dots)$ or $1.98(03\dots)(\%)$ rounded or truncated  CAO