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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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| 1. (Amount needed to save after next week)<br>(£)510 – 165 or (£) 510 – (95 + 70)<br>or (£) 510 – 95 – 70 (=£345)<br><br><br><br><br><br><br><br><br><br>(Amount to save per week £) ÷ 12<br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><b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| Unit 2: Intermediate Tier                   |                                                                                               | Mark                                                                                                                                                                                 | Comments                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2(c) a = 43(°)                              |                                                                                               | B1                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| b = 137(°)                                  |                                                                                               | B1                                                                                                                                                                                   | FT b = 180 - 'their a', provided<br>'their b' > 90 and 'their b' ≠ 112                                                                                                                                                                                                                                                                                                                                           |
| c = 112(°)                                  |                                                                                               | B1                                                                                                                                                                                   | FT 360 – (68 + 'their a' + 'their b'), provided:<br><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: |                                                                                               |                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                             |                                                                                               | OR                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Method using £                              |                                                                                               | Method using \$                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Camera Fox                                  | (62.95 + 3.90 =) (£)66.85 B1                                                                  | (62.95 + 3.90) × 1.25 or (£)66.85 × 1.25<br>or 62.95 × 1.25 + 3.90 × 1.25 M1<br>(\$83.56(25) or (78.69 + 4.88 = \$)83.57<br>Allow an answer in the range<br>(\$ 83.55 to (\$83.57 A1 |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| US Camera Geek                              | 81.20 ÷ 1.25 M1<br>(£)64.96 A1                                                                | (\$81.20 given)                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Sure Camera                                 | 75 – 75 × 0.14 or 75 – 10.50<br>or 75 × (1 – 0.14) M1<br>(£)64.50 A1                          | (75 – 75 × 0.14) × 1.25 or 64.50 × 1.25<br>or 75 × (1 – 0.14) × 1.25 M2<br>(\$80.62(5) or (\$80.63 A1                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Conclusion<br>'Sure Camera'                 | Costs 66.85, 64.96 and 64.50 WITH<br>incorrect conclusion or no conclusion<br>penalise -1     | Costs in dollars correct WITH incorrect<br>conclusion or no conclusion<br>penalise -1                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| OR method using £ and \$                    |                                                                                               |                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                             |                                                                                               |                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| £                                           |                                                                                               | \$                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Camera Fox                                  | (62.95 + 3.90 =) (£)66.85 B1                                                                  |                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| US Camera Geek                              |                                                                                               | (\$81.20 given)                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Sure Camera                                 | 75 – 75 × 0.14 M1<br>(£)64.50 A1                                                              | or                                                                                                                                                                                   | (75 – 75 × 0.14) × 1.25 M2<br>(\$80.62(5) or (\$80.63 A1                                                                                                                                                                                                                                                                                                                                                         |
| Conclusion                                  | Costs (£)66.85 with (£)64.50 and (\$80.62(5) (or (\$80.63)<br>AND conclusion 'Sure Camera' A1 |                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Organisation and communication              |                                                                                               | OC1                                                                                                                                                                                  | For OC1, candidates will be expected to:<br><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:<br><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><br/> (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)<br/> *(£)195.36 to (£)195.42 or 19536(p) to 19542(p)</p> <p>(Total including VAT =)<br/> <math>1.05 \times 195(. )36</math> to <math>1.05 \times 195(. )42</math></p> <p>*(£)205.12 to (£)205.19(1)<br/> or 20512(p) to 20519(.1p)</p> | <p>M1<br/>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<br/> 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><br/> (Number of kWh per day) <math>\div 30</math><br/> (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)<br/> 6.51(...) or 651(...p)</p> <p>(Total including VAT =)<br/> <math>1.05 \times 6.51(...) \times 30</math></p> <p>*(£)205.12 to (£)205.19(1)<br/> or 20512(p) to 20519(.1p)</p>                                               | <p>M1<br/>m1<br/>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)<br/> (= 51.6149133...kWh)</p> <p>CAO</p> <p>FT 'their derived cost of gas per day' + <math>(0.)32</math> correctly evaluated<br/> May be implied in later working</p> <p>(= 6.83(94...) <math>\times</math> 30 or <math>6.84 \times 30</math>)<br/> 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> |

| Unit 2: Intermediate Tier                                                                                                                                                                                                                                                                                                                                                                                                           | Mark                   | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5(a) $\frac{247}{400}$                                                                                                                                                                                                                                                                                                                                                                                                              | B2                     | Mark final answer<br>B1 for sight of $\frac{988}{1600}$ or $\frac{494}{800}$<br>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<br><br>28 800 (km)                                                                                                                                                                                                                                                                                                                                                 | M1<br><br>A1           | Accept use of $\times 1.6$ to $\times 1.613$ or $\div 0.62$ to $\div 0.625$<br><br>Also accept answers in the range<br>28960 (km) to 28980 (km)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 5(c) (Cost of tarmac) $1600 \times 23 \times 0.035 \times 250$<br><br>(£) 322 000                                                                                                                                                                                                                                                                                                                                                   | M2<br><br>A1           | M1 for a product including any 3 of these 4 values<br>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> CAO<br>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<br><br>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)<br><br>(2009 to 2014)<br>$(100 \times) \frac{6.40-5.40}{5.40}$ or $\frac{1}{5.40}$ or $\frac{6.40}{5.40}$ (- 1)<br><br>(2004 to 2009)<br>$(100 \times) \frac{5.40-4.60}{4.60}$ or $\frac{0.80}{4.60}$ or $\frac{5.40}{4.60}$ (- 1)<br><br>Choice of '2009 to 2014' <b>AND</b> 18.5(.... %) or 19(%)<br><b>AND</b><br>sight of 17(.39...%) or 17.3 (%) or 17.4 (%)<br>or 1.17(...) or 117.(...) or 0.17(...) (for 2004 to 2009) | M1<br><br>M1<br><br>A2 | Ignore any working for '2014 to 2019'<br>Accept working in £ or p consistently<br><br><br><br><br>Answer space takes precedence<br>Allow percentage increase given as 18(%)<br><br>Award M mark as well as A mark for a correct percentage from a 'reverse percentage method'<br><br>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><br>If M1 A1 awarded for 2004 to 2009, also award M1 for (2009 2014) $1.1739 \times 5.40 =$ (£)6.339 (< 6.40)<br><br>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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| 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.<br>'no people in group 0 to 6 hours'                                           | E1                     | <p>Allow 'No' with e.g.<br/>'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.<br/>'it is grouped data' (unless explaining why)<br/>'there is no point at 6'<br/>'6 hours has a frequency of 0'<br/>'it does not match a group of people'<br/>'the first point is at 0 and the second one is at 20'<br/>'the first plot is at 20'<br/>'the first plot is at 9 hours'<br/>'the first plot above 0 is at 9 hours'<br/>'there is no information at 6 hours, it starts at 9 hours'<br/>'the shortest time is 9 hours'</p> |
| 6(b) Sight of 22.5, 25.5, 29.5 and 31.5 (mm)<br><br>$22.5 + 25.5 + 29.5 + 31.5$ or $22+25+29+31 + 4 \times 0.5$<br>or equivalent<br><br>109 (mm) | B1<br><br>M1<br><br>A1 | <p>Award B1 for sight of <math>4 \times 0.5</math> in an appropriate calculation<br/>Allow 0.4999(...) for 0.5, must clearly be a recurring 9 digit</p> <p>If B0, FT provided unambiguously chosen:<br/> <math>22 &lt; \text{'their 22.5'} \leq 23</math>, <math>25 &lt; \text{'their 25.5'} \leq 26</math>,<br/> <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<br/>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><br>$0.324 \times 8 \times (10 \text{ or } 12) \times 7 \times 80 \div 1000$<br>$0.324 \times 8 \times (12 \text{ or } 10) \times 7 \times 80 \div 1000$ <p style="text-align: center;">with the intention to subtract</p><br><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<br/>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><u>Allow '× 32.4' for '× 0.324'</u><br/>M2 for any 4 or 5 correct terms*<br/>M1 for any 3 correct terms*</p> <p>Must be an indication of the intention to subtract, in either order<br/><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<br/>All working must be checked, do not award 5 marks for £2.90 from incorrect working.</p> |
| <p><u>Alternative method:</u><br/>Method <b>directly</b> working with a stated or omitted number of hours difference</p><br>$0.324 \times 8 \times 2 \times 7 \times 80 \div 1000$<br><p>(Saving is)      (£) 2.90</p>                                                                                                                                                                  | <p>M4</p> <p>A1</p>           | <p><i>Methods may be shown in stages or be embedded<br/>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><u>Allow '× 32.4' for '× 0.324'</u><br/>M3 for any 5 correct terms*<br/>M2 for any 4 correct terms*<br/>M1 for any 3 correct terms*</p> <p>CAO<br/>All working must be checked, do not award 5 marks for £2.90 from incorrect working.</p>                                                                                                                                                                                                                                                                                                                                                                       |

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

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



| Unit 2: Intermediate Tier               | Mark | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| 9(b)(ii) 368 187 456 (km <sup>2</sup> ) | B3   | <p>ISW</p> <p>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> |