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# **GCSE MARKING SCHEME**

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**AUTUMN 2022**

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

## **INTRODUCTION**

This marking scheme was used by WJEC for the 2022 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.



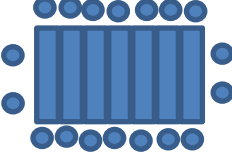
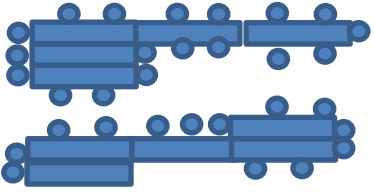
## WJEC GCSE MATHEMATICS – NUMERACY

### AUTUMN 2022 MARK SCHEME

Unit 2: Foundation Tier	Mark	Comments
<p>1.(a) (Pen y Fan 7) Snowdon 14, Cadair Idris 8, Cadair Berwyn 6</p> <p>Both axes labelled</p> <p>Uniform scale starting from zero on frequency axis</p> <p>All bars correct heights and same widths. The 4 bars can be in any order.</p>	<p>B2</p> <p>B1</p> <p>B1</p> <p>B2</p>	<p>May be seen or inferred from their bar chart or tallies (or other diagram/graph) If scale such as going up in 5s, 4s, or 3s are used, award B2 for frequencies that are implied to be correct if unambiguous.</p> <p>Award B1 for either:</p> <ul style="list-style-type: none"> <li>• Two out of Snowdon (14), Cadair Idris (8) and Cadair Berwyn (6)</li> <li>• Cadair Berwyn as 35 – 7 – ('their 14' + 'their 8')</li> </ul> <p>E.g. number of people or frequency and individual names of mountains. The names of mountains may be on the bars or anywhere within the base of the corresponding bar.</p> <p>Allow a frequency scale starting with 1 at the top of the first square to imply a scale starting with zero. <i>Allow the numbers in the boxes as long as it is a uniform scale used and starts from zero.</i></p> <p>FT their frequencies or tallies throughout <b>if seen</b>. If B0 awarded for no uniform scale, FT if an implied uniform scale has been applied or FT 'their uniform scale' If no scale, allow one square to represent 1. Allow bars to be joined. Allow different size gaps between bars.</p> <p>Award B1 for any one of the following:</p> <ul style="list-style-type: none"> <li>• 2 or 3 correct bars with correct frequencies</li> <li>• Correct heights with inconsistent widths</li> <li>• Correct heights with bars not complete</li> <li>• Vertical line graph drawn with correct heights</li> <li>• Implied correct heights of 2 or 3 bars when using a scale such as 2 squares are worth 5 and the heights are not quite accurate.</li> </ul>
<p>1(b) <math>(8 - 7 =) 1</math></p>	<p>B1</p>	<p>Allow -1 FT 'their Cadair Idris' – 7 or FT 7 – 'their Cadair Idris'</p>

<p>1(c) Reasonable explanation, e.g.          'because the most popular is Snowdon'          'because that is not the most popular'          'because the modal is Snowdon'          'because Snowdon has the most amount of people'          'because Pen Y Fan was not the most picked'          'because Pen y Fan only had 7 whereas Snowdon had 14'          'because the majority picked Snowdon'          'because Snowdon was liked the most'</p>	<p>E1</p>	<p>FT 'their bar chart'. Ignore spurious statements if correct statement also seen.</p> <p>Allow:          'because it's Snowdon'          'because the modal is the most'          'because Snowdon had the most likes'          'because there are others with more'          'because Cadair Idris is one more'          'because Snowdon has more people with the highest amount'          'because Cadair Idris and Snowdon have more'          'no it is Snowdon because it's not the biggest'          '14 people chose the mode (whereas only 7 chose Pen Y Fan)'          'because Snowdon is the highest'</p> <p>Do not allow:          'because Cadair Berwyn is less than Pen Y Fan'          'because it's (only) 7 for Pen Y Fan'          'because Pen Y Fan isn't in the middle of the 4 mountains'          'because it's not the middle or average number'          'because the modal is 14'</p>
<p>1(d)(i) <math>800 \times 3.3</math>          2640 (feet)</p>	<p>M1 A1</p>	<p>This may be seen in stages eg <math>3.3 \times 100 \times 8</math></p>
<p>1(d)(ii) 10:30 + 3hrs 45 mins</p> <p>14:15</p>	<p>M1  A1</p>	<p>Sight of 2:15 or 13:75 or 14:15am implies M1          Allow 10(:)30 + 3(:)45 for M1          If using adding on methods, it must be a clear method to award M1 with 3 hours and 45 minutes clearly being added on.</p> <p>Allow 14:15pm but not 14:15am          'Do not accept 2:15 with or without p.m or a.m)</p>
<p>1(d)(iii) Monday          6 (°C)</p> <p>Median = 1 (°C)</p>	<p>B1 B1  B2</p>	<p>Allow -2(°C) as indication of Monday          Award B0 for -6(°C)          FT from 'Sunday' with answer of 5</p> <p>Award B1 for:          Numbers in order: -2, -1, 0, 1, 3, 3, 4 or reverse order</p>

<p>2(a) (Cost of fruit scones <math>36 \times 52\text{p} =</math>  <math>1872\text{p}</math>) or (£)18.72  (Cost of cream <math>4 \times 1.27 =</math>) (£)5.08  (Cost of jam <math>3 \times 2.16 =</math>) (£)6.48  (Cost of sandwiches <math>9 \times 7.98 =</math>) (£)71.82</p> <p>(Total costs <math>18.72 + 5.08 + 6.48 + 71.82 + 230 =</math>  (£)332.1(0))</p> <p>(Needs to save) (£)332.1(0) - (£)250  (£)82.1(0)</p>	<p>B3</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Ignore incorrect units for the first B3 marks  Award B3 for all 4 costs correct  Award B2 for any 3 costs correct  Award B1 for any 2 costs correct</p> <p>FT 'their costs' provided B1 previously awarded and 5 costs, all in consistent units, added</p> <p>FT 'their derived' total costs providing greater than (£)250  If units given they must be correct. Allow £82.1(0)p</p> <p>If no marks awarded, award SC1 for an answer of £241.93 for 'their total costs'</p>
<p><u>Alternative method</u></p> <p>2(a) (Cost of fruit scones <math>36 \times 52\text{p} =</math>  <math>1872\text{p}</math>) or (£)18.72  (Cost of cream <math>4 \times 1.27 =</math>) (£)5.08  (Cost of jam <math>3 \times 2.16 =</math>) (£)6.48  (Cost of sandwiches <math>9 \times 7.98 =</math>) (£)71.82</p> <p>(Food costs <math>18.72 + 5.08 + 6.48 + 71.82 =</math>  (£)102.1(0))</p> <p>(Needs to save) <math>102.1(0) - (250 - 230)</math>  (£)82.1(0)</p>	<p>B3</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Ignore incorrect units for the first B3 marks  Award B3 for all 4 costs correct  Award B2 for any 3 costs correct  Award B1 for any 2 costs correct</p> <p>FT 'their food costs' provided B1 previously awarded and 4 costs, all in consistent units, added</p> <p>FT 'their derived' total food costs</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>
<p>2(b) Correct completed triangle drawn within tolerance. (Use overlay)</p>	<p>B3</p>	<p>Allow if triangle is reflected.  B3 or B2 can only be awarded if the measurements are from the given 14cm base line or a new 14cm base line is drawn on the page.  Award B2 for</p> <ul style="list-style-type: none"> <li>• <math>40^\circ (\pm 2^\circ)</math> <b>and</b> 14 cm (<math>\pm 2\text{mm}</math>) correct but triangle not completed</li> <li>• Either <math>40^\circ (\pm 2^\circ)</math> <b>or</b> 14 cm (<math>\pm 2\text{mm}</math>) correct in a completed triangle</li> </ul> <p>If B2 not awarded, award B1 for</p> <ul style="list-style-type: none"> <li>• Either <math>40^\circ (\pm 2^\circ)</math> or 14 cm (<math>\pm 2\text{mm}</math>) (not the base line) correct in a triangle not completed or using a new base line drawn of any size.</li> </ul>

<p>2(c) Diagram showing 4 tables with 18 chairs around the edges with 2 chairs on each of the longer sides and 1 chair on each of the shorter sides.</p> 	<p>B2 Award B1 for sight of 4 tables in this format with or without chairs</p>  <p>OR</p> <p>Award B1 for 7 tables with the <b>longer</b> sides touching with 18 chairs</p>  <p>Or B1 for a combination of tables set out with all 18 chairs correctly placed with 2 chairs on each long side and 1 chair on each short side eg</p> 
<p>3(a) <b>Use</b> of 1 million as 1 000 000</p> <p><math>0.02 \times 2.2 (\times 1\,000\,000)</math> or <math>(1\,000\,000 \times) 2.2 \div 50</math> or equivalent</p> <p>(£) 44 000 or (£) 44,000</p>	<p>B1 May be seen at any stage of working or implied by a correct answer Accept from sight of 2.2 million written as 2 200 000 Allow as implied from one of the following:</p> <ul style="list-style-type: none"> <li>sight of an appropriate stage of working, e.g. 1% as 22 000 or 10% as 220 000 or 50% as 1 100 000</li> <li>an answer of 40 000 provided not from <math>0.2 \times 2</math> million</li> </ul> <p>M1 The method must be for the intention of finding 2% of 2.2 million, not any other percentage May be implied, from a full method, from sight of</p> <ul style="list-style-type: none"> <li><math>0.02 \times</math> 'digits 22 with place value error'</li> <li>when working not shown, only non-zero digits of 44 in their answers</li> </ul> <p>Award M0 for <math>1.02 \times 2.2</math> or <math>0.98 \times 2.2</math> or <math>0.2 \times 2.2</math></p> <p>A1 CAO. Answer space takes precedence Do not accept (£)0.044 (million) or 44.000 (A0) unless 44000 seen in working (A1)</p>

3(b)(i) $\frac{115}{360}$	B1	
3(b)(ii) Gold $20^\circ \pm 2^\circ$ $1800 \times \frac{20 (\pm 2)}{360}$ or $5 \times (20 (\pm 2))$ or equivalent  100 (gold medals)	B1  M1  A1	Check the diagram  Also implies previous B1 FT for any value used for '20' provided $\neq 180^\circ$ and $< 360^\circ$ for M1 only (including use of $160^\circ$ )  A correct answer from using $20^\circ \pm 2^\circ$ in the inclusive range 90 to 110 (gold medals), not from premature approximation ( $20/360 = 0.05$ , then $0.05 \times 1800 = 90$ B1 M1 A0)
4(a) $23/100 \times 4000$ or equivalent  $\frac{920}{(920 - 800=)}$ 120 (euros)	M1  A1 A1	Answer line takes precedence Allow full correct method e.g. <ul style="list-style-type: none"> <li>using 10% and 1% i.e. <math>400 + 400 + 40 + 40 + 40</math> or equivalent</li> <li><math>4000 - 77/100 \times 4000</math></li> </ul> FT from M1 A0 'their 920' – 800 correctly evaluated
<i>Alternative Method</i> 4(a) $23/100 \times 4000 - 800$  120 (euros)	M2  A1	<i>Answer line takes precedence</i> Award M2 for $(4000 - 800) - 77/100 \times 4000$ $(3200 - 3080)$  Award M1 for $23/100 \times 4000$ or equivalent
4(b) $3600 \div 1.11$  (£) 3243.24	M1 A1	Answer space takes precedence Sight of (£) 3243 or 3243.2(4324....) implies M1

<p>5(a)</p> <p>(Gas usage 21640 – 21345 =) 295 (kWh)</p> <p>(Cost of gas excluding VAT)  <math>295 \times 7.2</math> or <math>295 \times 0.072</math></p> <p>2124(p) or (£)21.24</p> <p>(Cost of gas including VAT) 2230(.2p) or (£)22.30(2)</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>B2</p>	<p><u>Incorrect unit of money is penalised – 1 once only on the first occurrence, by withholding an A or B mark</u></p> <p>FT ‘their 21640 – 21345’ for M1 and possible A1</p> <p>FT ‘their number of units’ including use of 21640 or 21345 or 21640 + 21345 for M1 but A0  Treat ‘<math>\times 0.72</math>’ as incorrect units, allow M1 but A0</p> <p>FT ‘their cost of gas excluding VAT’, accepting rounding or truncation to a penny</p> <p>B1 for one of the following:</p> <ul style="list-style-type: none"> <li>• (Cost of gas including VAT) <math>21(. )24 \times 1.05</math></li> <li>• (VAT) 106(.2p) or (£)1.06(2)</li> </ul>
<p>5(b) <math>13.2 \times 7 + 12.2 + 12.4</math> (= 117)</p> <p><math>\div 9</math></p> <p>13 (°C)</p>	<p>M2</p> <p>m1</p> <p>A1</p>	<p>M1 for sight of one of the following:</p> <ul style="list-style-type: none"> <li>• <math>13.2 \times 7</math> or equivalent</li> <li>• 92.4</li> <li>• a sum shown with a given total of 92 to 93 inclusive for 7 possible temperatures</li> </ul> <p>FT from M2 or from <math>12.2 + 12.4 +</math> ‘their sum with a total of 92 to 93 inclusive for 7 possible temperatures</p> <p>CAO from <math>117 \div 9</math>  Answer space takes precedence</p>
<p>5(c)</p> <p>a = 98(°)</p> <p>b = 63(°)</p> <p>c = 117(°)</p>	<p>B1</p> <p>B1</p> <p>B1</p>	<p>Answer space takes precedence</p> <p>FT 180 – ‘their b’ provided ‘their b’ <math>\neq 90^\circ</math> or <math>\neq 180^\circ</math></p>



<p>6(a) Reasonable explanation, e.g.          'no one spent longer than 80 minutes training'          '1 hour 25 minutes is more than 80 minutes'</p>	<p>E1</p>	<p>Allow, e.g.          'graph only goes up to 80 (minutes)'          'only shows to 1 hour 20 minutes'          'doesn't show above 80 minutes'          'the graph doesn't extend that much'          'the bar doesn't go up to 1 hour 25 minutes'          'the bar doesn't go up to 85 minutes'          'no one spent 1 hour 25 minutes in the gym'          'the maximum he could have spent was 1 hour 20 minutes'          '85 minutes was not recorded'          'goes no later than 1 hour 20 minutes'</p> <p>Do not accept, e.g.          'the graph only gives 20 minute time groups (slots)'          'because in a frequency graph there is no way to know who is Freddie'          'he spent 1 hour 20 minutes in the gym'          'he spent an hour in the gym'          'the graph shows he didn't spend 1 hour 25 minutes in the gym'          '1 hour 25 minutes is 85 minutes'</p>
<p>6(b) 14</p>	<p>B1</p>	
<p>6(c) 38</p>	<p>B1</p>	
<p>6(d)          (Total number of men) <math>14 + 22 + 48 + 16</math>          OR (Total number of women) <math>12 + 26 + 54 + 22</math></p> <p>(Total men) 100 AND (Total women) 114</p> <p>Method considering proportions, e.g. sight of any of:</p> <ul style="list-style-type: none"> <li>• <math>\frac{48}{100}</math> AND <math>\frac{54}{114}</math></li> <li>• 48% of 114</li> <li>• <math>\frac{54}{114}</math> of 100</li> </ul> <p>'False' unambiguously selected or implied <b>and</b> accurate appropriate calculations to justify choice of 'False', e.g.</p> <ul style="list-style-type: none"> <li>• 48% <b>and</b> 47(.3...) % or 47.4%</li> <li>• 0.48 <b>and</b> 0.47(3...)</li> <li>• (48% of 114 =) 54.7(2) <b>and</b> 54 (women)</li> </ul>	<p>M1</p> <p>A2</p> <p>M1</p> <p>A1</p>	<p>Check the graphs for working          FT 'their 12 + 26' from (c), i.e. 'their 38' + 54 + 22</p> <p>A1 for either total correct</p> <p>FT 'their 48, 100, 54, and 114' providing at least two of them are correct and 'their total for men 100' <math>\neq</math> 'their total for women 114'</p> <p>Allow 'True' if justified by correct calculations from their 4 values.</p>

<p>7. (Time difference) 5 hours 17:40 + 9 hours 15 minutes + 5 hours</p> <p>Tuesday 07(:)55 or Tuesday (0)7(:)55 a.m.</p>	<p>B1 M1</p> <p>A2</p>	<p>Seen or implied FT adding 'their 5 hours', provided 'their 5 hours' <math>\neq</math> 0 or negative May be seen in stages</p> <p>Answer space takes precedence unless unambiguously time in the morning from working A1 for the correct time, 07(:)55 or (0)7(:)55 a.m. or 'Tuesday 7(:)55' or 'Tuesday (0)7(:)55 p.m.'</p> <p><u>Special cases and/or implied 5 hours:</u> provided not from incorrect working</p> <table border="1" data-bbox="858 528 1386 808"> <tr> <td>Monday 21:55 (p.m.)</td> <td>B1 SC1</td> </tr> <tr> <td>Monday (0)9(:)55 p.m.</td> <td>B1 SC1</td> </tr> <tr> <td>Monday (0)9(:)55</td> <td>B1</td> </tr> <tr> <td colspan="2" style="text-align: center;"><u>If no marks:</u></td> </tr> <tr> <td>Tuesday (0)2(:)55</td> <td>SC1</td> </tr> <tr> <td>Tuesday (0)2(:)55 a.m.</td> <td>SC1</td> </tr> </table> <p>No marks for Monday (0)9(:)55 a.m. or Tuesday 2(:)55 p.m.</p>	Monday 21:55 (p.m.)	B1 SC1	Monday (0)9(:)55 p.m.	B1 SC1	Monday (0)9(:)55	B1	<u>If no marks:</u>		Tuesday (0)2(:)55	SC1	Tuesday (0)2(:)55 a.m.	SC1
Monday 21:55 (p.m.)	B1 SC1													
Monday (0)9(:)55 p.m.	B1 SC1													
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Tuesday (0)2(:)55	SC1													
Tuesday (0)2(:)55 a.m.	SC1													