



GCSE MARKING SCHEME

SUMMER 2023

**GCSE
MATHEMATICS
UNIT 1 – INTERMEDIATE TIER
3300U30-1**

INTRODUCTION

This marking scheme was used by WJEC for the 2023 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.

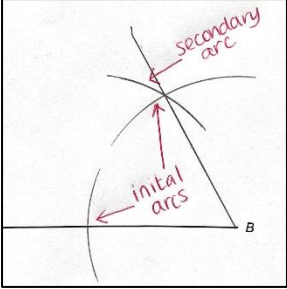
It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

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

<p>3.(a)(ii)</p> $3x = 27$ $(x =) 9$	<p>B1 B1</p>	<p>Mark final answer.</p> <p>FT from $3x = k$. Unsupported answer of 9 is awarded B1B1. $x = \frac{27}{3}$ is awarded B1B0.</p> <p>If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction (e.g. if $3x = 7$, then $x = \frac{7}{3}$ is awarded B0B1, but $x = 7 \div 3$ is awarded B0B0).</p> <p>Allow B1B1 for a correct embedded answer BUT B1B0 if contradicted by $x \neq 9$.</p>																						
<p>3.(b)</p> $8f - 13g$	<p>B2</p>	<p>Mark final answer. Must be an expression for B2. Award B1 for one of the following:</p> <ul style="list-style-type: none"> • sight of (+)8f • sight of -13g (do not allow- -13g) • 8f + - 13g. 																						
<p>4.(a)</p> <p>11 lb</p>	<p>B1</p>																							
<p>4.(b)</p> <p>175 pints</p>	<p>B1</p>																							
<p>5.</p> $2(n - 7) \text{ or equivalent e.g. } 2n - 14.$	<p>B3</p>	<p>Answer space takes precedence.</p> <p>For B3, accept as a final answer of:</p> <ul style="list-style-type: none"> • $2 \times (n - 7)$ • $(n - 7)2$ • $(n - 7) \times 2$. <p>Award B2 if incorrect subsequent working for one of the above.</p> <p>Award B2 for sight of one of the following:</p> <table border="1" data-bbox="858 1265 1374 1659"> <thead> <tr> <th>missing brackets</th> <th>error in Samir's age</th> </tr> </thead> <tbody> <tr> <td>• $2 \times n - 7$</td> <td>• $2(n + 7)$</td> </tr> <tr> <td>• $n - 7 \times 2$</td> <td>• $2 \times (n + 7)$</td> </tr> <tr> <td></td> <td>• $(n + 7)2$</td> </tr> <tr> <td></td> <td>• $(n + 7) \times 2$</td> </tr> <tr> <td></td> <td>• $2(7 - n)$</td> </tr> <tr> <td></td> <td>• $2 \times (7 - n)$</td> </tr> <tr> <td></td> <td>• $(7 - n)2$</td> </tr> <tr> <td></td> <td>• $(7 - n) \times 2$</td> </tr> <tr> <td></td> <td>• $2n + 14$</td> </tr> <tr> <td></td> <td>• $14 - 2n$</td> </tr> </tbody> </table> <p>Award B1 for sight of one of the following:</p> <ul style="list-style-type: none"> • $n - 7$ • $2 \times n + 7$ • $n + 7 \times 2$ • $2 \times 7 - n$ • $7 - n \times 2$ • $2n - 7$ • $n - 14$ • $n - 72$. <p>Allow use of a different letter for n.</p>	missing brackets	error in Samir's age	• $2 \times n - 7$	• $2(n + 7)$	• $n - 7 \times 2$	• $2 \times (n + 7)$		• $(n + 7)2$		• $(n + 7) \times 2$		• $2(7 - n)$		• $2 \times (7 - n)$		• $(7 - n)2$		• $(7 - n) \times 2$		• $2n + 14$		• $14 - 2n$
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<p>8. Organisation and Communication.</p> <p>Accuracy of writing.</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.
<p>9.(a) $\frac{48}{400} (\times 100)$ or equivalent = 12(%)</p>	<p>M1</p> <p>A1</p>	<p>M1 for sight of 0.12.</p> <p>Note: other complete valid methods to look out for include:</p> <ul style="list-style-type: none"> • $48 \div 4$ • $10\% + 1\% + 1\%$ (= 40 + 4 + 4) • (48 out of 400 =) 12 out of 100 = 12(%)
<p>9.(b) Use of $\frac{45}{9}$ or equivalent (£)40 AND (£)5</p>	<p>M1</p> <p>A1</p>	<p>Sight of an appropriate 5 (or 40) implies M1.</p> <p>Accept in either order.</p>
<p>9.(c) $(1 - \frac{1}{8})$ = $\frac{7}{8}$</p>	<p>B1</p> <p>B1</p>	<p>Award B1 for sight of $\frac{1}{8}$ or 0.125 or $1 \div 8$.</p> <p>FT from $1 - \frac{m}{n}$ where $\frac{m}{n}$ clearly shown as 'their $\frac{1}{8}$' provided it is written as a fraction and not $\frac{1}{2}$</p> <p>Mark final answer. A final answer of 0.875 is awarded B1B0.</p>
<p>9(c) <i>Alternative method</i> $\frac{8-1}{8}$ or $\frac{2^3-1}{2^3}$ = $\frac{7}{8}$</p>	<p>B1</p> <p>B1</p>	<p>For consistent correct use of $2^3 = 8$</p> <p>FT for 'their consistent value of 2^3' e.g. $\frac{6-1}{6} = \frac{5}{6}$ gains B0B1.</p> <p>Mark final answer. A final answer of 0.875 is awarded B1B0.</p>
<p>10. $\frac{3}{4} \times 512$ OR $512 - \frac{1}{4} \times 512$ or equivalent = 384</p> <p>$\frac{3}{4} \times 384$ OR $384 - \frac{1}{4} \times 384$ or equivalent</p> <p>(OUTPUT =) 288 ISW</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>Award M1 for full method for calculating the OUTPUT.(Note: $512 - 128$).</p> <p>Award M1 for full method for calculating the OUTPUT.(Note: $384 - 96$). FT 'their 384' if greater than 300.</p> <p>FT if 'their 288' < 300, or further evaluation correctly carried out until their output < 300.</p> <p>If no marks gained allow SC1 for sight of 128. Award M2 for $\frac{9}{16} \times 512$ with answer of 288 is awarded A2.</p>

11.(a)		B2	<p>Award B2 for the correct rotation drawn with no other shapes drawn on the grid.</p> <p>Award B1 for a 90° correct clockwise rotation with either:</p> <ul style="list-style-type: none"> no other shapes drawn on the grid the correct rotation (no others).
11.(b)(i)		B1	
11.(b)(ii)	$\begin{pmatrix} 1 \\ -7 \end{pmatrix}$	B1	<p>Award B0 for</p> <ul style="list-style-type: none"> 1 (missing brackets) -7 $\begin{pmatrix} -7 \\ 1 \end{pmatrix}$ $(1, -7)$ $\frac{1}{-7}$ with or without brackets. $-\begin{pmatrix} -1 \\ 7 \end{pmatrix}$.
12.(a)	<p>For a single method that produces 2 prime factors from the set {3, 3, 3, 5, 5} before the 2nd error.</p> <p>3, 3, 3, 5, 5</p> <p>$3^3 \times 5^2$</p>	M1 A1 B1	<p>Must be a method that involves only division. Check for errors in the method before checking the 2 prime factors from the set. (Note $675 = 5 \times 135$ $675 = 3 \times 225$ $135 = 5 \times 27$ $135 = 3 \times 45$)</p> <p>CAO. For sight of the five correct factors (Ignore 1s)</p> <p>Do not FT non-primes. FT 'their primes' provided at least one index form used with at least a square. Allow $(3^3)(5^2)$ and $3^3 \cdot 5^2$ and $3^3 5^2$ Do not allow $3^3, 5^2$ Inclusion of 1 as a factor gets B0.</p>
12.(b)	10	B1	Do not accept 2×5 .
13.(a)(i)	m^7	B1	
13.(a)(ii)	m^{10}	B1	
13.(b)	$7n - 3$	B2	<p>Mark final answer. B1 for sight of $7n$. Allow notation of $n7$ or $7 \times n$ or $n \times 7$ for $7n$. Allow N for n, but penalise -1 for use of a different letter.</p>

<p>13.(c)</p> <p style="text-align: center;">7, 8 and 9</p>	<p>B2</p>	<p>Answer line takes precedence. Award B2 for all three integers and no extras.</p> <p>Award B1 for one of the following indicated as a final answer:</p> <ul style="list-style-type: none"> • 7, 8, 9 and only one other incorrect value • for two correct with no incorrect value • 7 to 9 • 7, 7.5, 8, 8.5, 9 • sight of $6.5 < n < 9.5$ or equivalent • 14,16,18 • 14,15,16,17,18. <p>Allow B2 for correct embedded answers of 7, 8 and 9 (e.g. sight of only $2 \times 7 = 14$, $2 \times 8 = 16$, $2 \times 9 = 18$ with no other calculations) BUT only B1 if contradicted on answer line (e.g. 14, 16, 18 for the example above).</p>
<p>14.(a)</p> <p style="text-align: center;">Correct construction of 60°</p>	<p>B1</p>	<p>Must be at point <i>B</i>. Correct construction arcs (two or three) must be seen (initial and secondary). B0 if 60° and 30° drawn. Ignore additional lines provided intended 60° is clear (e.g any triangle, including equilateral <i>ABC</i>). For example:</p> 
<p>14.(b)</p> <p style="text-align: center;">Correct construction of 90°</p>	<p>B1</p>	<p>Must be at point <i>R</i> above or below <i>LM</i>. Correct construction arcs (initial and secondary) must be seen.</p>
<p>14.(c)</p> <p style="text-align: center;"><u>All</u> correct construction arcs shown</p> <p style="text-align: center;">Line drawn</p>	<p>M1</p> <p style="text-align: center;">A1</p>	<p>Arc, <u>centre P</u>, intersecting <i>XY</i> at two points. (<i>X</i> may be one of the points with no arc seen at point <i>X</i>) [Note to markers: These arcs may be identified by the fact that they will 'cross the line <i>XY</i> at an acute angle'. Arcs 'crossing the line at 90°' is evidence of an inappropriate method.] AND Intersecting arcs (equal radii) using the above two points as centres. Ignore line extended above <i>XY</i> for M1.</p> <p>Ignore line extended above <i>XY</i> for M1A1.</p>
<p>14.(c) <i>Alternative method</i> (Using the properties of a kite.) <u>All</u> correct construction arcs shown.</p> <p style="text-align: center;">Line drawn</p>	<p>M1</p> <p style="text-align: center;">A1</p>	<p><i>Intersecting arcs whose centres are any two points on the line <i>XY</i> and respective radii equal in length to the distance from the points to the point <i>P</i>.</i></p> <p>[Note to markers: The arcs will always intersect at a point that is a 'reflection of point <i>P</i>' in the line <i>XY</i>.]</p>

<p>15.</p> $(AC^2 =) 8^2 + 6^2$ $(AC =) \sqrt{8^2 + 6^2} \text{ or equivalent}$ $(AC =) 10 \text{ (cm)}$ <p>(Curved length =)</p> <ul style="list-style-type: none"> • $\frac{6 \times 3.14}{2}$ • $\frac{2 \times 3 \times 3.14}{2}$ • 3×3.14 • 3π • 9.42 or equivalent <p>(Perimeter of shape = $8 + 10 + 9.42 =$) $27.42(\text{cm})$</p>	<p>M1 m1 A1</p> <p>B1</p> <p>A1</p>	<p>Check diagram. Note: $(AC^2 =) 64 + 36$ FT from $\sqrt{\text{'their } 8^2 + \text{'their } 6^2}$ CAO. Final answer of $AC = 100$ is M1m0A0.</p> <p>Do not ignore subsequent working e.g. $3 \times 3.14 = 9.42$, then 9.42×2 or $9.42 \div 2$ would gain B0.</p> <p>Allow $27.4(\text{cm})$. Award A0 for $18 + 3\pi$. FT 'their AC' only if M1 gained. FT 'their curved length' only if B0 awarded and for one of the following:</p> <ul style="list-style-type: none"> • 3.14 used to find the circumference of a circle • area of a semicircle used. <p>For example, M1m1A1 awarded for 10 (cm), B1 for $3 \times 3.14 = 9 \text{ (cm)}$ A0 for $8 + 10 + 9 = 27 \text{ (cm)}$ as B1 previously awarded.</p> <p>Note, if a final answer of:</p> <ul style="list-style-type: none"> • $33.4(2)(\text{cm})$ is given (6cm also included) award M1m1A1B1A0 • $36.8(4)(\text{cm})$ is given (full circumference used) award M1m1A1B0A1 • $32.1(3) \text{ (cm)}$ is given (area semicircle used) award M1m1A1B0A1.
<p>16. Sight of 4(hr) 35(min) AND 2(hr) 45(min) OR Sight of 275(min) AND 165(min)</p> <p>OR sight of $2 \times 5(\text{min})$ in an appropriate calculation.</p> <p>Valid method e.g.</p> <ul style="list-style-type: none"> • $4(\text{hr}) 35(\text{min}) + 2(\text{hr}) 45(\text{min}) (=6(\text{hr}) 80(\text{min}))$ $275(\text{min}) + 165(\text{min}) (= 440 \text{ (min))}$ • $6 \text{ (hr) } 90 \text{ (min) } - 10 \text{ (min)}$ • $7 \text{ (hr) } 30 \text{ (min) } - 10 \text{ (min)}$ • $4(\text{hr}) 40(\text{min}) + 2(\text{hr}) 50(\text{min}) - 10 \text{ (min)}$ • $280 \text{ (min) } + 170 \text{ (min) } - 10(\text{min})$ <p style="text-align: right;">$7 \text{ (hr) } 20 \text{ (min)}$</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Allow incorrect notation for time (e.g. 4:35 for 4(hr) 35(min)).</p> <p>If B0, FT provided unambiguously chosen: '4h 30m $\leq t_1 < 4\text{h } 40\text{m}$' and '2h 40m $\leq t_2 < 2\text{h } 50\text{m}$' OR '270m $\leq t_1 < 280\text{m}$' and '160m $\leq t_2 < 170\text{m}$' Allow incorrect notation for time (e.g. 4:35 for 4(hr) 35(min)).</p> <p>CAO. If units are given they must be correct. Award B1M1A0 for a final answer of 6hrs 80min, 6:80 or 7:20.</p>
<p>17.(a) $P(\text{Bus} =) 1 - 0.25 - 0.45$ $= 0.3$ AND shown on relevant branch.</p> <p>0.96 shown on <u>all</u> three branches.</p>	<p>M1 A1 B1</p>	<p>Award M1A0 for 0.3 in working space and not on diagram.</p>
<p>17.(b) 0.25×0.04 or equivalent $= 0.01$ or equivalent</p>	<p>M1 A1</p>	<p>CAO</p>

