



GCSE MARKING SCHEME

AUTUMN 2021

**GCSE
MATHEMATICS – COMPONENT 2
(FOUNDATION TIER)
C300U20-1**

INTRODUCTION

This marking scheme was used by WJEC for the 2021 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.

EDUQAS GCSE MATHEMATICS

AUTUMN 2021 MARK SCHEME

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
1.(a) certain	B1	
1.(b) likely	B1	
1.(c) unlikely	B1	
	(3)	
2.(a) $0.5 \times 10.8(0) + 3 \times 0.64 + 4 \times 0.49$ (£)9.28 or 928(p)	M1 A1	e.g. $5.4(0) + 1.92 + 1.96$ May be in pence Allow M1 for $0.5 \times 10.8(0) + 3 \times 0.64 + 4 \times 49$ If units are given they must be correct. Allow £9.28p
2.(b) $0.25 \times 10.8(0) + 4 \times 0.64 (= 5.26)$ $10 - (0.25 \times 10.8(0) + 4 \times 0.64)$ (£)4.74 or 474(p)	M1 M1 A1	May be in pence but units must be consistent for both M marks; implied by sight of 5.26 or $2.7(0) + 2.56$ FT 'their 3×0.64 ' from (a) + 0.64 and $0.5 \times$ 'their 0.5×10.8 ' from (a) FT 'their $0.25 \times 10.8(0) + 4 \times 0.64$ ' providing <10 and includes use of both 10.8(0) & 0.64 or the sum of the two values 2.7(0) and 2.56 where one is correct FT If units are given they must be correct. Allow £4.74p
	(5)	
3.(a) $360 - (69 + 58)$ 233	M1 A1	Or equivalent complete method.
3.(b) $180 - (96 + 37)$ 47	M1 A1	Or equivalent complete method.
	(4)	

4.(a)(i) Draws a rectangle with dimensions: 2 cm by 12 cm or 3 cm by 8 cm or 4 cm by 6 cm	B1	Allow good freehand
4.(a)(ii) 28 (cm) or 22 (cm) or 20 (cm)	B1	STRICT FT 'their rectangle' from part (i) but allow a correct perimeter from labelled lengths in (a)(i)
4.(b) $ABC = 75^\circ$ $BC = 6.4$ cm	B1 B1	$\pm 2^\circ$ ± 0.2 cm If B2 is awarded then penalise -1 if the triangle is incomplete. If B2 is awarded but the line AB has been redrawn incorrectly then penalise -1.
	(4)	
5.(a) (£)2.9(0)	B1	
5.(b) $5 \times 11.25 = 30.50$ (£)25.75	M1 A1	If no marks, award SC1 for $5 \times 8.35 = 30.50 = 11.25$
5.(c) Day tickets and (£)25.05	B2	B1 for (£)25.05 only or 3×8.35
	(5)	
6. 8 and 10 in the correct order	B3	As final answer or last trial Allow B2 for an answer of 10 and 8 B1 for sight of any one of the pairs: 9 and 11, 8 and 10, 7 and 9, 6 and 8, 5 and 7 AND B1 for sight of any one of the pairs: 10 and 11, 6 and 9, 4 and 8, 2 and 7
<i>Alternative method</i> $a = b - 2$ AND $b - 6 = \frac{a}{2}$ or $2(b - 6) = a$ oe <i>Eliminates one variable e.g.</i> $b - 2 = 2(b - 6)$ or $a + 2 = \frac{a}{2} + 12$ oe $a = 8$ AND $b = 10$	B1 M1 A1	<i>Final answer or in the correct order on the answer line.</i>
	(3)	
7.(a)(i) w^2	B1	
7.(a)(ii) $8x - 1$	B2	B1 for $8x$ or -1 in an expression with two terms Award B1 only for $8x + -1$

7.(b)(i) 2.25 or $\frac{9}{4}$ or $2\frac{1}{4}$	B1	
7.(b)(ii) (k =) 12×26	M1	
312	A1 (6)	May be embedded
8.(a)(i) 50.4 (cm)	B1	
8.(a)(ii) No indicated and valid explanation e.g. 'He has incorrectly changed 1.53 m to cm' or 'He should have used $153 \div 18$ ' or 'The 85 should be mm.'	E1	Allow No indicated and e.g. 'The answer should be 8.5 cm' or ' $1.53 \div 18 = 0.085\text{m}$ '
8.(b)(i) 2 : 1 oe	B1	
8.(b)(ii) $(114 \div 3) \times 2$ oe 76 (hours)	M1 A1	FT 'their 2 : 1', in the form $a : b$ where $a \neq b$ and which cannot be simplified to 1 : CAO If no marks, award SC1 for an answer of 38 (hours; from use of 1 : 2 oe)
	(5)	
9.(a) 2 6	B1	
9.(b) Correct line for $-3 \leq x \leq 3$ drawn	B2	B1 for at least 3 of the points from their table plotted correctly
9.(c) (0, 5)	B1	
9.(d) The line $x = 2$ drawn	B1	
9.(e) (2, 7)	B1	
	(6)	
10.(a) 0.69×118 oe 81.42 (p)	M1 A1	May be in steps An answer of 81 or 0.8142 is awarded M1 A0
10.(b) 51×1.35 (£)68.85 $130.29 - 68.85 (= 61.44)$ $\div 48$ (£) 1.28	M1 A1 M1 m1 A1 (7)	or equivalent in pence; FT 'their 51×1.35 ' CAO

<p>11. Attempts to find a unit cost e.g. per 100 ml (£)1.74 ÷ 4 , (£)3.01 ÷ 7, (£)3.96 ÷ 9</p> <p>Finds a unit cost e.g. per 100 ml (£)0.435, (£)0.43, (£)0.44</p> <p>All unit costs correct and medium bottle indicated</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>For at least 2 of the 3 bottles</p> <p>For correct unit costs for at least 2 of the 3 bottles Ignore incorrect units</p> <table border="1" data-bbox="823 320 1342 450"> <thead> <tr> <th></th> <th>pence per ml</th> <th>ml per £</th> </tr> </thead> <tbody> <tr> <td>400ml</td> <td>0.435p</td> <td>229.88...</td> </tr> <tr> <td>700ml</td> <td>0.43p</td> <td>232.55...</td> </tr> <tr> <td>900ml</td> <td>0.44p</td> <td>227.27...</td> </tr> </tbody> </table> <p>They may use different unit costs to compare small with medium and then medium with large, so it may be in steps; units may be omitted but must be consistent.</p>		pence per ml	ml per £	400ml	0.435p	229.88...	700ml	0.43p	232.55...	900ml	0.44p	227.27...
	pence per ml	ml per £												
400ml	0.435p	229.88...												
700ml	0.43p	232.55...												
900ml	0.44p	227.27...												
(3)														
<p>12.(a)(i) 123</p> <p>12.(a)(ii)</p> <p>$\frac{57}{123}$ oe</p>	<p>B1</p> <p>B2</p>	<p>FT 'their 123' provided it is greater than 57. If all four values are seen above with only an error in the 42 or the 15 FT the correct sum of 'their 42' + 15 or 42 + 'their 15'</p> <p>e.g. $\frac{19}{41}$;</p> <p>B1 for sight of 57 or B1 for $\frac{42+15}{123}$</p>												
<p>12.(b)(i) 5</p>	<p>B1</p>													
<p>12.(b)(ii) 47</p>	<p>B2</p>	<p>B1 for indicating e.g. between 65th and 66th data point; allow 65th or 66th or $130 \div 2 = 65$ or $131 \div 2 = 65.5$ for B1</p>												
<p>12.(b)(iii) (45×7)+(46×24)+(47×35)+(48×37)+(49×18)+(50×9) ÷ 130 47.4(7...)</p>	<p>M1</p> <p>m1</p> <p>A1</p>	<p>seen or implied by e.g. 6172 or a list of products with a clear attempt to sum</p> <p>Allow 47.5 or 47 from correct working</p>												
<p>12.(b)(iv) 48 and yes indicated</p>	<p>B1</p>	<p>FT 'their mean' from (b)(iii) for the decision made</p>												
(10)														
<p>13.(a)(i) 40</p>	<p>B1</p>													
<p>13.(a)(ii) 15 (%)</p>	<p>B1</p>													
<p>13.(a)(iii) 155 or 154.8 54</p>	<p>B2</p>	<p>Allow B2 for 154.8 and 54.2 B1 for each angle or for two angles that sum to 209</p>												
<p>13.(a)(iv) Correct line drawn</p>	<p>B1</p>	<p>±2° FT for correct use of either of 'their 155' or 'their 54' If labels are present, they must be correct</p>												

13.(b) 360 ÷ 45 × 6 oe	M1	May be seen in stages e.g. 8 × 45 = 360 and 8 × 6 = 48
48 and Ricky indicated	A1	FT 'their 40' from part (a)(i) for the decision
<i>Alternative method</i> Jon: 2 hours is 18° 1 hour is 9° or Ricky: 6 hours is 45° 2 hours is 15°	M1	
5 hours is 45° and Ricky indicated or 2 hours is 15° compared with 2 hours is 18° and Ricky indicated	A1	
	(7)	
14.(a) 68 + 232 ÷ 8 (= 68 + 29 = 97) (300 – 97) × 72 (= 14 616)	M1 M2	Allow equivalent working in litres FT 'their 97' provided it is not 68 or 232 M1 for 300 – 97 (= 203)
14 616 ÷ 2000 (= 7.308) or 7 bottles = 14 000	M1	FT 'their 14 616'; provided at least M2 previously awarded; implied by sight of 7.3(...)
8	A1	CAO with no incorrect working seen An answer of 8 does not imply full marks but allow full marks if the first 3 marks have been awarded and an answer of 8 stated
<i>Alternative method</i> 68 × 72 + 232 ÷ 8 × 72 (= 4896 + 2088 = 6984)	M2	M1 for 232 ÷ 8 × 72
72 × 300 – (68 × 72 + 232 ÷ 8 × 72) (= 14 616)	M1	FT 'their 68 × 72 + 232 ÷ 8 × 72'
14 616 ÷ 2000 (= 7.308) or 7 bottles = 14 000	M1	FT 'their 14 616'; provided at least M2 previously awarded; implied by sight of 7.3(...)
8	A1	CAO with no incorrect working seen An answer of 8 does not imply full marks but allow full marks if the first 3 marks have been awarded and an answer of 8 stated
14.(b) (cost of fruit for one glass =) 108 ÷ 6 + 56 ÷ 8 (= 25p or £0.25)	M1	may be in pounds or pence but units must be consistent
$25 + \frac{60}{100} \times 25$ oe	M2	For M2 or M1, FT 'their derived 25' provided obtained using 108(p) and 56 (p) or equivalent; M1 for $\frac{60}{100} \times$ 'their 25' oe
40(p) or (£)0.40	A1	CAO If units are given they must be correct. Allow £0.40p

<p><i>Alternative method</i> (cost of fruit for 72 glasses =) $72(1.08 \div 6 + 0.56 \div 8)$ (= £18 or 1800p) or $72 \div 6 \times 1.08 + 72 \div 8 \times 0.56$ or $12 \times 1.08 + 9 \times 0.56$</p> $\left(18 + \frac{60}{100} \times 18\right) \div 72$ (= 28.80 ÷ 72) oe <p>40(p) or (£)0.40</p>	<p>M1</p> <p>M2</p> <p>A1</p>	<p>may be in pounds or pence but units must be consistent;</p> <p>For M2 or M1, FT 'their derived 18' provided obtained using 108(p) and 56 (p) oe;</p> <p>M1 for $\frac{60}{100} \times$ 'their 18'oe</p> <p>CAO</p> <p>If units are given they must be correct. Allow £0.40p</p>												
(9)														
<p>15.</p> $0.5 \times (3.9 + 4.6) \times 2.4$ or $(3.9 \times 2.4) + \frac{1}{2} \times (4.6 - 3.9) \times 2.4$ <p>10.2</p> 10.2×1.35 <p style="text-align: center;">OR $14 \div 1.35$</p> <p>(£)13.77</p> <p style="text-align: center;">OR 10.3(7...)</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>For correct structure of formula;</p> <p>CAO</p> <p>FT 'their derived 10.2'; must be derived from a dimensionally correct formula</p> <p>FT 'their derived 10.2 × 1.35' provided both M1's awarded and 'their answer' < 14</p>												
(4)														
<p>16.</p> <p>Two correct conversions to enable a comparison.</p> <p>50 knots = 58 mph OR 65 mph = 56 knots OR 50 knots = 92.6 km/h and 65 mph = 104 km/h</p> <table border="1" data-bbox="181 1417 707 1529"> <thead> <tr> <th></th> <th>mph</th> <th>km/h</th> <th>knots</th> </tr> </thead> <tbody> <tr> <td>Jet Ski</td> <td>65</td> <td>104</td> <td>56</td> </tr> <tr> <td>Speedboat</td> <td>58</td> <td>92.6</td> <td>50</td> </tr> </tbody> </table> <p>$104 \times \frac{15}{60}$ oe</p> <p>Jet Ski and 26 km</p>		mph	km/h	knots	Jet Ski	65	104	56	Speedboat	58	92.6	50	<p>B2</p> <p>M1</p> <p>A1</p>	<p>Speeds may be in other units e.g. 'per 15 mins'</p> <p>B1 for one correct conversion seen</p> <p>Allow approximate values to be rounded or truncated to the nearest integer;</p> <p>FT provided at least B1 awarded and the larger of 'their 65/0.625' oe and 'their 50 × 1.852' oe is selected e.g. $104 \div 4$ (= 26)</p> <p>FT</p> <p>If no marks, award SC1 for the speedboat travels 12.5 (nautical miles) in 15 mins and the jet ski travels 16.25 (miles) in 15 mins</p>
	mph	km/h	knots											
Jet Ski	65	104	56											
Speedboat	58	92.6	50											
(4)														

<p>17.*(a) $6x - x = 5 + 1$ oe</p> <p>$x = \frac{6}{5}$ oe, ISW</p>	<p>B1</p> <p>B1</p>	<p>FT from $ax = 6$, $a \neq 1$ or $5x = b$ accept $\frac{6}{a}$ or $\frac{b}{5}$ but if on FT either simplifies to an integer the answer must be given as an integer.</p> <p>'x =' can be omitted but must not be wrong if there.</p> <p>Correct answer implies first B1. Final answer of $x = \frac{-6}{-5}$ is B0.</p> <p>Maximum of 1 mark if not fully correct</p>
<p>17.(b) A correct equation e.g. $2x + 10 = 116$ $2(x + 5) = 116$ $x + 5 = 58$ $x = 116 \div 2 - 5$</p> <p>53</p>	<p>B2</p> <p>B1</p>	<p>B1 for $2(x + 5)$ or $2x + 10$</p> <p>If no marks award: SC2 for $x = 55.5$ following $2x + 5 = 116$ SC1 for $2x + 5 = 116$</p>
(5)		
<p>18.* 130×1.06^{10}</p> <p>(£)232.81</p>	<p>M2</p> <p>A1</p>	<p>May be seen in stages; M1 for sight of 130×1.06 (= 137.8)</p> <p>CAO An answer of (£)208 (simple interest) from use of $130 \times 0.06 \times 10 + 130$ is awarded M1 A0</p>
(3)		
<p>19.*</p> <p>(radius =) $\frac{40.841}{2\pi}$ (= 6.50...)</p> <p>(Area =) $\pi \times \left(\frac{40.841}{2\pi}\right)^2$ (= $\pi \times 6.5^2$)</p> <p>132.7(...) or 133 (cm²)</p>	<p>B2</p> <p>M1</p> <p>A1</p>	<p>B1 for $2\pi r = 40.841$ or $\pi d = 40.841$ or $\frac{40.841}{\pi}$ or 13.0</p> <p>FT 'their derived radius'</p> <p>CAO; correct answer implies all previous marks</p>
(4)		

<p>20.* $a + 4c = 16.30$ and $2a + 3c = 19.10$</p> <p>Method to eliminate an unknown e.g. equal coefficients and subtraction</p> <p>or rearranges one equation and substitutes into the other</p> <p>Finds one unknown</p> <p>Finds the other unknown or finds $16.3(0) + 19.1(0) - 6 \times 2.7(0)$</p> <p>(£)19.2(0)</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>A1</p> <p>B1</p>	<p>May use other letters or words throughout</p> <p>FT their equations provided one is correct and the other is linear in the same pair of unknowns;</p> <p>Allow one error in one term, but not in the equated coefficients</p> <p>CAO; $a = 5.5(0)$ or $c = 2.7(0)$</p> <p>FT 'their a' or 'their c' used in one of their equations</p> <p>FT 3('their derived a') + ('their derived c') or $35.4 - 6 \times$ 'their derived c' provided at least one mark previously awarded.</p> <p>Unsupported 19.2(0) is awarded no marks</p>

<p>21.*(a)</p> <p>$\sin^{-1}\left(\frac{0.5}{6}\right)$</p> <p>4.7(8...)</p>	<p>M2</p> <p>A1</p>	<p>M1 for $\sin(\) = \frac{0.5}{6}$</p> <p>Unsupported 4.7(8...) is awarded no marks</p>
<p>21.(b)</p> <p>$\sqrt{1.8^2 - 0.6^2}$ (= 1.69705....)</p> <p>$\frac{\sqrt{1.8^2 - 0.6^2} \times 0.6}{2}$ $\times 2.5$</p> <p>1.27(...) or 1.28 or 1.3 (m³)</p>	<p>M2</p> <p>M1</p> <p>m1</p> <p>A1</p>	<p>M1 for $1.8^2 - 0.6^2$ or $x^2 + 0.6^2 = 1.8^2$</p> <p>Allow FT from use of $\sqrt{1.8^2 + 0.6^2}$ (= 1.897....)</p> <p>CAO</p>

(8)		

<p>22.*(a)(i)</p> $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$	<p>B2</p>	<p>B1 for sight of $\begin{pmatrix} 3 \\ -5 \end{pmatrix} + \begin{pmatrix} 3 \\ 4 \end{pmatrix}$</p> <p>Allow B1 for $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$ written incorrectly e.g. $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$</p>
<p>22.(a)(ii)</p> <p>Correct shape <i>B</i> drawn at (2, 1), (2, 4), (3, 4), (3, 2), (4, 2), (4, 1),</p>	<p>B2</p>	<p>or correct FT;</p> <p>FT 'their' $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$;</p> <p>B1 for a translation attempted with at least 4 vertices correct or shape <i>A</i> correctly translated by $\begin{pmatrix} 6 \\ y \end{pmatrix}$ where $y \neq -1$ or $\begin{pmatrix} x \\ -1 \end{pmatrix}$ where $x \neq 6$</p> <p>If no marks in (a) then award SC1 for a clear attempt to translate by $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$ and $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$.</p>
<p>22.(b)</p> <p>Reflection (in the line) $y = x$</p>	<p>B2</p>	<p>B1 for either stating a reflection or giving the equation $y = x$</p> <p>Award no marks if more than one transformation indicated</p> <p>If no marks then award SC1 for a correct diagram with the line $y = x$ drawn.</p>
<p>(6)</p>		
<p>23.(a)</p> $7x^2 + 5x - 42x - 30$ $7x^2 - 37x - 30$	<p>B2</p> <p>B1</p>	<p>B1 for any three terms correct; $nx^2 - 37x + m$ implies two terms correct if not from wrong working</p> <p>Implies previous B2; FT for equivalent level of difficulty, providing 4 terms to consider and like terms to collect</p>
<p>23.(b)</p> $y(y + 2x)$	<p>B1</p>	
<p>(4)</p>		