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# **GCSE MARKING SCHEME**

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**AUTUMN 2020**

**GCSE  
MATHEMATICS – UNIT 1 (FOUNDATION TIER)  
3300U10-1**

## **INTRODUCTION**




This marking scheme was used by WJEC for the 2020 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.

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**WJEC GCSE MATHEMATICS**  
**AUTUMN 2020 MARK SCHEME**

GCSE Mathematics Unit 1: Foundation Tier	Mark	Comments
1. (a) Angle of 35° drawn at A	B1	Accept 33° to 37° Point alone is not sufficient.
1.(b) Circle radius 7cm (diameter 14 cm)	B1	Accept radius 6.8 (cm) to 7.2 (cm)
2.(a) 5433	B1	
2.(b) 174	B1	
2.(c) 75	B1	
2.(d) $6 \times 7 \div 2$ = 21	M1 A1	If no marks, award SC1 for sight of 42.
3.(a) 600	B1	
3.(b) 4000	B1	
4.(a) D	B1	
4.(b) S	B1	
5.(a) 9	B1	
5.(b) $\div$ —	B1	
6.(a) 53	B1	
6.(b) 125	B1	
7.(a) 70 (%)	B1	
7.(b) 6 sectors shaded	B1	
8. $\frac{1}{3} \times 180(^{\circ})$ OR $\frac{2}{3} \times 180(^{\circ})$ or equivalent  60(°) OR 120(°)  (180 – 60 =) 120 (°) OR (180 – 120 =) 60 (°)	M1  A1  B1	A1 for either 60(°) OR 120(°)  FT 'their 60' or 'their 120'. Two angles which add to 180(°) will get this B1. If no marks award SC1 for one angle twice the size of the other.
<u>Alternative Method</u> $2x + x = 180 (^{\circ})$ or $3x = 180 (^{\circ})$ $x = 60 (^{\circ})$ $2x = 120 (^{\circ})$	M1 A1 B1	FT 2 × 'their x' or 180 – 'their x'
9.(a) 16g	B1	
9.(b) (y =) 9	B1	Accept embedded answers. Mark final answer.
9.(c) (w =) 30	B1	Accept embedded answers. Mark final answer.

9.(d)	$4x = 10 - 7 (=3)$ $x = \frac{3}{4}$ or equivalent.	B1 B1	FT from $4x = b$ . Integer answer required if b is a multiple of 4 Mark final answer. Allow an embedded answer eg $4 \times 0.75 + 7 = 10$ for B2, but penalise -1 if contradicted by $x \neq 0.75$
10. (Factors of) 16, OR 32, OR 64, ...	(Multiples of) 4	B1  B1	Accept any multiple of 16 which does not have a factor of 3.
11. 9, 13 and 14 10, 13 and 15 11, 13 and 16 12, 13 and 17	OR OR OR	B2	Allow in any order. B1 for 3 whole numbers with a median of 13 OR B1 for 3 whole numbers with a range of 5 Penalise -1 for any repeated numbers. e.g. 8, 13, 13 gains B2 -1 = B1 13, 13, 13 gains B1 -1 = B0.
12.	  (Perimeter =) $8 \times 7 + 2 \times 3$ (cm) or equivalent (Perimeter =) 62 (cm)	B1  M1 A1	May be implied by correct method which would lead to an answer of 62 (cm). (This is the only diagram which can gain B1.) If no diagram, then B1 M1 A1 for correct calculation which leads to answer of 62 (cm).  FT these large rectangles only:   B0  (Perimeter =) $8 \times 3 + 2 \times 7$ (cm) or equivalent M1 (Perimeter =) 38 (cm) A1 OR  B0  (Perimeter =) $4 \times 7 + 4 \times 3$ (cm) or equivalent M1 (Perimeter =) 40 (cm) A1  If no diagram, allow SC1 for ( $8 \times 3 + 2 \times 7$ or equivalent) = 38 (cm) OR ( $4 \times 7 + 4 \times 3$ or equivalent) = 40 (cm).
Organisation and Communication		OC1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> <li>present their response in a structured way</li> <li>explain to the reader what they are doing at each step of their response</li> <li>lay out their explanation 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>
Accuracy of writing		W1	For W1, candidates will be expected to: <ul style="list-style-type: none"> <li>show all their working</li> <li>make few, if any, errors in spelling, punctuation and grammar</li> <li>use correct mathematical form in their working</li> <li>use appropriate terminology, units, etc.</li> </ul>
13.(a)	20(:)18 OR 8(:)18 p.m..	B1	B0 for (0)8:18 or 8:18 a.m. or 20:18 a.m. Allow 20(:)18 p.m. and 08:18 p.m.



19.(a) Correct <u>construction</u> method. e.g. (i) intersecting arcs of radii 6cm and 9cm with centres A and C respectively. OR (ii) copying the angle at B at the point A (will require AB or BA to be extended).  Completed parallelogram.	M1  A1	Relevant construction arcs must be seen.
19.(b) 'measured length' $\times$ 200 = 1520 (cm) = 15.2 metres	M1 A1 B1	Allow for error in measuring line XY. Accept only in range 1480 to 1560 inclusive. FT 'their 1520' $\div$ 100. Unsupported 14.8 to 15.6 inclusive gains all 3 marks.
<u>Alternative method</u> Sight of scale is 1cm represents 2m 'measured length' $\times$ 2 = 15.2 metres	B1 M1 A1	Allow for error in measuring line XY. Accept only in range 14.8 to 15.6 inclusive.
20.(a) 9.231	B1	
20.(b) 170	B1	
20.(c) 10	B1	



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# **GCSE MARKING SCHEME**

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**AUTUMN 2020**

**GCSE  
MATHEMATICS – UNIT 2 (FOUNDATION TIER)  
3300U20-1**

## **INTRODUCTION**

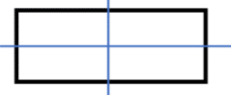
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**WJEC GCSE MATHEMATICS**  
**AUTUMN 2020 MARK SCHEME**

GCSE MATHEMATICS Unit 2: Foundation Tier		Mark	Comments
1.	1.98 53 5.88 0.41	B1 B1 B1 B1	Ignore spurious units
2.(a)	3 700 000	B1	
2.(b)	9998	B1	
2.(c)	1, 3, 5 and 15	B2	Ignore repeats. Allow $1 \times 15$ and $3 \times 5$ . B1 for 2 correct factors with none incorrect, OR for 3 or 4 correct with no more than one incorrect.
3.(a)	unlikely	B1	
3.(b)	20	B1	
3.(c)	Rolling a 1 on the dice	B1	
4.(a)		B2	B1 for two correct lines with one incorrect line OR for one correct line with no incorrect lines.
4.(b)	(an) equilateral (triangle)	B1	
5.(a)	102 OR 120	B1	
5.(b)	201 OR 210	B1	
6.	Three different even numbers with a sum of 24, not including 8. Possible solutions are 2, 4 (and) 18 2, 6 (and) 16 2, 10 (and) 12 4, 6 (and) 14	B3	In any order. Allow inclusion of negative numbers.  If B3 not awarded, award B2 for three numbers which sum to 24 which satisfy two of the three conditions: <ul style="list-style-type: none"> <li>The numbers are different</li> <li>The numbers are even</li> <li>None of the numbers is 8</li> </ul> If B2 not awarded, award B1 for three numbers which sum to 24.
7.(a)	0.12 or $\frac{3}{25}$ or equivalent	B1	
7.(b)	$\frac{3}{5} \times 632$ or equivalent $= 379.2$	M1 A1	Award M1 A0 for $1896/5$ or $379\frac{1}{5}$ .
7.(c)	2.5	B1	
8.	$\frac{3}{10}$ 30  $\frac{9}{(20)}$ 0.45	B1 B1  B1 B1	Accept 30/100 for 3/10

9. (Length of sides of Ivy's Cuboid B =) 3cm, 12cm, 20cm (Volume of Ivy's Cuboid =) $3 \times 12 \times 20$  $= 720 \text{ (cm}^3\text{)}$	B1 M1 A1	May be implied in further working.  F.T. provided two of the dimensions are correct.
<u>Alternative method</u> (Volume of Gareth's cuboid = $3 \times 2 \times 4$ =) $24 \text{ (cm}^3\text{)}$ (Volume of Ivy's cuboid =) $24 \times 6 \times 5$ $= 720 \text{ (cm}^3\text{)}$	B1 M1 A1	F.T. for their stated volume for 'Gareth's cuboid'
9. OCW Organisation and Communication           Accuracy of writing	OC1          W1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanation 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> For W1, candidates will be expected to: <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc.</li> </ul>
10.(a)(i) 16	B1	
10.(a)(ii) 2160	B2	B1 for sight of 2155(.....) OR 2150 OR 2156. Mark final answer.
10.(b) $0.62 \times 7.8$ or equivalent. $= 4.836$ ISW	M1 A1	Unsupported 4.8.... implies M1. Accept $4^{209/250}$ (ISW). Allow 1209/250 (ISW)
10.(c)(i) 247	B1	
10.(c)(ii) 2197	B1	
11.(a) 6 -5	B2	B1 for 6. B1 FT for correct evaluation of 'their 6' – 11 <b>only</b> if it leads to a <u>negative</u> answer.
11.(b) 15	B2	B1 for sight of 28.8 OR -13.8. Mark final answer.
12. $\frac{400}{17.5}$ or $\frac{4}{0.175}$ .  $= 22.8(\dots)$ or 22.9  (Number of rods =) 22	M2 A1  B1	M1 if incorrect place value (in either length). Digits 228..... implies M1. C.A.O.  FT if of equivalent difficulty. (i.e. 'their 22.8' must be greater than 1 AND their 1 <sup>st</sup> decimal place number greater than or equal to 5.) Answer of 22 gains all 4 marks. Unsupported answer of 23 gains M2A0B0.
12. <u>Alternative method (trial and improvement)</u> Working with a multiple of 17.5 or 0.175. ( $n \times 17.5$ or $n \times 0.175$ ) $22 \times 17.5 (= 385)$ or $22 \times 0.175 (= 3.85)$ $23 \times 17.5 (= 402.5)$ or $23 \times 0.175 (= 4.025)$  (Number of rods =) 22	S1  B1 B1  B1	Award this S1 only if $n > 2$ and $n \neq 4$ and $n \neq 400$ . This implies previous S1. This implies previous S1 and previous B1 if 402.5 seen. Must be seen in answer space or unambiguously identified (not simply embedded). Answer of 22 gains all 4 marks. Unsupported answer of 23 gains S1B0B1B0.

13.(a)		B2	B1 for each individual shape. Ignore clearly deleted shading.
13.(b)	Reflection (in the line) $x = 5$	B2	B1 for stating 'Reflection'. Ignore extra wording once 'reflection' (or 'reflected') seen. B1 for stating $x = 5$ (simply drawing the line is B0)
14.(a)	$10x + 15 = 20$ OR $2x + 3 = 4$ $10x = 5$ OR $2x = 1$ $x = \frac{5}{10}$ OR $x = \frac{1}{2}$ or equivalent	B1 B1 B1	FT until 2 <sup>nd</sup> error.  Mark final answer. Allow an embedded answer but penalise -1 if contradicted by $x \neq \frac{1}{2}$ or $0.5$ .
14.(b)	$5(n - 3)$ or $5 \times (n - 3)$ or $(n - 3)5$ or $(n - 3) \times 5$ or $5n - 15$	B2	B1 for sight of $n - 3 \times 5$ OR sight of $5 \times n - 3$ . B0 for unsupported $n - 15$ OR unsupported $5n - 3$ . Allow ' $n = 5(n - 3)$ ' etc Mark final answer.
15.(a)	<p>YES</p> <p>AND a valid explanation.</p> <p>e.g. 'the other two angles would be (both) <math>20^\circ</math>'</p> <p>e.g. diagram showing (isosceles) triangle with angles of <math>140^\circ</math>, <math>20^\circ</math> and <math>20^\circ</math>.</p>	E1	<p>A valid explanation implies YES circled if not otherwise contradicted (by circling NO).</p> <p>Explanations must engage with the specific triangle given (with an angle of <math>140^\circ</math>) and not isosceles triangles in general.</p>
15.(b)	$a + b = 150$	B1	
16.	$[n(G \cap S) =] \quad 10$ $[n(S) =] \quad 13$	B1 B1	<p>Entries must be a whole numbers.</p> <p><math>[n(\mathcal{E})]</math> must be 30 (i.e. no additional 'non-Spanish'). Any blank space to be taken as 0.</p>
17.	<p>(Length of AD or BC =) 10 (cm)</p> <p>(Area of ABCD = <math>5 \times 10</math> =) 50 (cm<sup>2</sup>)</p> <p>(Area APB =) <math>\frac{\pi \times 5^2}{4}</math>  = 19.6(.....)(cm<sup>2</sup>)</p> <p>(Shaded area = <math>50 - 19.6</math> =) 30.3(...) or 30.4(cm<sup>2</sup>)</p>	B1  B1 M1 A1 B1	<p>May be seen on the diagram or implied in later work.</p> <p>FT <math>5 \times</math> 'their AD (or BC)'. The 50(cm<sup>2</sup>) may be shown as two areas of 25(cm<sup>2</sup>) for B1 B1.</p> <p>SC1 for sight of <math>\pi \times 5^2</math> or equivalent (78.5....)</p> <p>FT 'their stated area ABCD' – 'their stated <u>area</u> APB'</p> <p><i>Note: Sight of <math>(25 - \text{'area of APB'}) + 25</math> implies the first two B marks. [rectangle divided in half]</i></p>



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# **GCSE MARKING SCHEME**

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**AUTUMN 2020**

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

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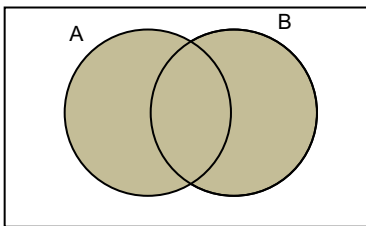
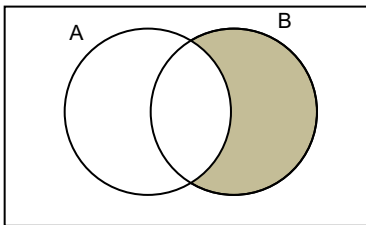
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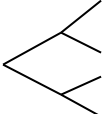
**WJEC GCSE MATHEMATICS**  
**AUTUMN 2020 MARK SCHEME**

GCSE Mathematics Unit 1 Intermediate Tier		Mark	Comments								
1.(a)	20(:)18 OR 8(:)18 p.m.	B1	B0 for (0)8:18 or 8:18 a.m or 20:18 a.m. Allow 20(:)18 p.m. and 08:18 p.m.								
1.(b)	6 (hours) 40 (minutes)	B1									
1.(c)	265 (seconds)	B2	B1 for sight of 435 AND 170 OR B1 for sight of 300 AND 35 OR B1 for 4 minutes 25 seconds.								
2.(a)	Line $x = -4$ drawn	B1	Line must be at least 2 units long. B0 if 'extra' lines drawn unless correct line unambiguously identified.								
2.(b)(i)	Point C shown at $(-2, -4)$	B2	Allow B2 if point C not labelled but is unambiguously at the correct position (eg 'end of line')  Otherwise, B1 if Point C at $(-2, y)$ $y \neq 3$ . ( $\hat{BAC} = 90^\circ$ ) SC1 for point C at $(5, -4)$ .								
2.(b)(ii)	$(-2, -4)$	B1	FT 'their unambiguously identified position of point C'. Allow missing brackets.								
3.(a)(i)	2700	B2	B1 for sight of 27 OR sight of 100. Mark final answer.								
3.(a)(ii)	0.08	B1	Mark final answer								
3.(a)(iii)	<u>Correctly</u> using a common denominator. $\frac{13}{18}$ or equivalent.	M1 A1	Mark final answer.								
3.(b)	0.05	B1									
4.	<table border="1"> <thead> <tr> <th>Answer</th><th>Yes</th><th>No</th><th>Not sure</th></tr> </thead> <tbody> <tr> <td>Number of students</td><td>150</td><td>50</td><td>100</td></tr> </tbody> </table>	Answer	Yes	No	Not sure	Number of students	150	50	100	B3	B1 for (Yes =) 150 C.A.O.  B2 for (No =) 50 AND (Not sure =) 100. or FT 'their Yes' for (No =) $\frac{1}{3}(300 - \text{'Yes'})$ AND (Not sure =) $\frac{2}{3}(300 - \text{'Yes'})$ If B2 not gained, then B1 for (No =) 50 OR (Not sure =) 100 or FT 'their Yes' for (No =) $\frac{1}{3}(300 - \text{'Yes'})$ OR (Not sure =) $\frac{2}{3}(300 - \text{'Yes'})$ or B1 for 'No' + 'Not sure' = 150 or B1 if 'Not sure' = $2 \times \text{'No'}$ . or B1 for 'Yes' + 'No' + 'Not sure' = 300.
Answer	Yes	No	Not sure								
Number of students	150	50	100								
5.(a)	$4x = 10 - 7 (=3)$ $x = \frac{3}{4}$ or equivalent.	B1 B1	FT from $4x = b$ . Integer answer required if b is a multiple of 4 Mark final answer. Allow an embedded answer eg $4 \times 0.75 + 7 = 10$ for B2, but penalise -1 if contradicted by $x \neq 0.75$								
5.(b)	$5d - 2e$	B2	Must be an expression for B2. B1 for sight of (+)5d OR sight of $-2e$ . B1 for $5d + -2e$ . Mark final answer.								
6.	$a = 113$ $b = 67$ $c = 113$	B1 B1 B1	C.A.O. OR FT 180 – 'their a'. OR FT = 'their a' OR FT 180 – 'their b'.								
7.	$AB = 13$ (cm)  $(\text{Area} =) 13 \times 13$ $= 169$ (cm <sup>2</sup> )	B1  M1 A1	For any indication that side of square = 13 (cm). May be seen on the diagram. No FT (but note SC1). C.A.O. Unsupported 169 (cm <sup>2</sup> ) gains all 3 marks. If no marks gained award SC1 for a final answer of 144 (cm <sup>2</sup> )								

8. (Probability of Puffin Island=) $1 - 0.4 - 0.15 - 0.25 = 0.2$  (Number of cards showing Puffin Island =) $0.2 \times 80 = 16$	M1 A1  M1  A1	An unsupported answer of 0.56 implies M1  FT 'their <u>stated</u> P(Puffin Island)' $\times 80$ , only if 'their <u>stated</u> P(Puffin Island)' $< 1$ .  16/80 is M1A0 unless 16 has been seen.
<u>Alternative method</u> (Number of cards showing other 3 islands =) $0.4 \times 80 + 0.15 \times 80 + 0.25 \times 80$ or equivalent $= 64$  (Number of cards showing Puffin Island =) $80 - 64 = 16$	M1 A1  M1  A1	Allow M1 for sight of 32 AND 12 AND 20.  FT $80 -$ 'their <u>derived</u> 64', only if 'their <u>derived</u> 64' $< 80$ . 16/80 is M1A0 unless 16 has been seen.
8. OCW  Organisation and Communication.          Accuracy of writing.	OC1          W1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> <li>present their response in a structured way</li> <li>explain to the reader what they are doing at each step of their response</li> <li>lay out their explanation 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> For W1, candidates will be expected to: <ul style="list-style-type: none"> <li>show all their working</li> <li>make few, if any, errors in spelling, punctuation and grammar</li> <li>use correct mathematical form in their working</li> <li>use appropriate terminology, units, etc</li> </ul>
9.(a) Correct construction method. e.g. (i) intersecting arcs of radii 6cm and 9cm with centres A and C respectively. OR (ii) copying the angle at B at the point A (will require AB or BA to be extended).  Completed parallelogram.	M1     A1	Relevant construction arcs must be seen.
9.(b) 'measured length' $\times 200 = 1520$ (cm) $= 15.2$ metres	M1 A1 B1	Allow for error in measuring line XY. Accept only in range 1480 to 1560 inclusive. FT 'their 1520' $\div 100$ . Unsupported 14.8 to 15.6 inclusive gains all 3 marks.
<u>Alternative method</u> Sight of scale is 1cm represents 2m 'measured length' $\times 2 = 15.2$ metres	B1 M1 A1	Allow for error in measuring line XY. Accept only in range 14.8 to 15.6 inclusive.
10.(a) 9.231	B1	
10.(b) 170	B1	
10.(c) 10	B1	
11(a) $5n - 3$	B2	B1 for sight of $5n$ . Mark final answer.
11.(b) 17	B1	
11.(c) $2n + 2$ OR $2(n + 1)$	B2	If $2n + 2$ is not their final answer allow B1 for sight of $2n + 2$ in earlier work. B1 for a correct answer not simplified or incorrectly simplified e.g. $n + n + 2$ .

12.(a)(i)		B1	
12.(a)(ii)		B1	
12.(b) A valid statement. e.g. 'all multiples of 6 are also multiples of 3', 'because 3 goes into 6', '6 is a multiple of 3', '3 is a factor of 6'.	E1	Allow e.g. '(set) C is a subset of (set) A', 'it is a multiple of 3', '6, 12, ... are also multiples of 3'.	
13. (One part =) (£)210 ÷ 3 = (£)70  (Total amount =) 14 × (£)70 OR (£)210 + 4 × (£)70 + 7 × (£)70 = (£)980	M1 A1  m1  A1	FT 'their (£)70' only if M1 gained. Allow m1 for sight of 210 AND 280 AND 490 together as the three shares.  <i>For 210 ÷ 3 × 14 M3 = 980 A1</i>	
14.(a) 9 -7	B2	B1 for each.	
14.(b) At least 6 correct plots and no incorrect plot.  A smooth curve drawn through their plots.	P1  C1	FT 'their (-2,9)' and 'their (2,-7)' Allow ± '½ a small square'. FT 'their 8 plots'. OR a curve through the 6 given points and (-2,9) and (2,-7). Allow intention to pass through their plots. (± 1 small square horizontal or vertical.)	
14.(c) Line y = 1 drawn  -0.8 AND 4.8	B1  B1	Must be at least 2cm long.  FT intersection of 'their curve' with 'their y = 1' only if exactly two points of intersection and y ≠ 0.  If curve drawn, but no line drawn, allow a FT from intersection of 'their curve' with line y = 1 only if exactly two points of intersection for B0B1. Allow ± '1 small square'.	
15. 4 5 11 12 OR 4 6 10 12 OR 4 7 9 12	B3	May be written in any order. B1 for Range = 8. B1 for Median = 8. B1 for Total = 32. Penalise -1 <b>once only</b> for repeated values, negatives or fractional answers e.g. 4, 8, 8, 12 earns B1 B1 B1 -1 (2 marks), 8, 8, 8, 8 earns B0 B1 B1 -1 (1 mark).	



16.(a)	$(x - 4)(x - 3)$ $(x =) 4$ AND $(x =) 3$	B2 B1	B1 for $(x \dots 4)(x \dots 3)$ . Ignore '=' 0'. <u>Strict FT from their brackets.</u> Allow the following. B2 for $x - 4 (=0)$ AND $x - 3 (=0)$ (B1) $(x =) 4$ AND $(x =) 3$ (B1)  B1 for $x + 4 (=0)$ AND $x + 3 (=0)$ (B0) $(x =) -4$ AND $(x =) -3$ (B1) FT  B1 if only $(x =) 4$ AND $(x =) 3$ seen. (B1)
16(b)	$25x^2 - 20x + 4$	B2	Otherwise B1 for sight of $25x^2 \pm kx + 4$ (allow $k = 0$ ) B1 for sight of $25x^2 - 20x - 4$ Mark final answer.
17.(a)	Correct framework   Suitable labelling on both 1 <sup>st</sup> pair of branches AND on both of at least one pair of 2 <sup>nd</sup> set of branches. e.g. 'Car', 'No car', 'Before 8', 'After 8'. OR Titles of 'Car' and 'Before 8' with branch endings of 'Yes' and 'No'.  Correct probabilities on first pair of branches 0.7 AND 0.3 (for 'Car', 'No car') OR 0.4 AND 0.6 (for 'Before 8', 'After 8')  Correct probabilities on second two sets of branches 0.4 AND 0.6 correctly placed (following 0.7 and 0.3) OR 0.7 AND 0.3 correctly placed (following 0.4 and 0.6)	B1  B1  B1  B1	  Accept any unambiguous wording.  Must be consistent with their labelling. Allow this B1 if no headings given, <u>unless</u> contradicted by, or inconsistent with, further labelling.  Allow this B1 if no headings given, <u>unless</u> contradicted by, or inconsistent with, further labelling.  Allow this B1 if only shown on one set of branches. Provided not contradicted on the other set of branches.
17.(b)	$0.7 \times 0.4$ or equivalent. $= 0.28$ or equivalent.	M1 A1	No FT. M1A0 for a final answer of 0.28%. Mark final answer.
18.(a)	PA = 12(cm) AND correct theorem given, e.g. 'tangents from an external point are equal in length'.	E1	Must use the words ' <u>tangents</u> ' AND ' <u>equal (identical / same)</u> '.  Do not accept e.g. 'PA = PB'. (E0) Accept alternative correct answers.
18.(b)	$\text{PAO} = 90^\circ$ AND correct theorem given, e.g. 'the tangent at any point on a circle is perpendicular to the radius at that point'.	E1	Must use the words ' <u>tangent</u> ' AND ' <u>radius (diameter)</u> '. Allow e.g. 'radius and tangent meet at 90'. (E1) Do not accept e.g. 'PA and OA meet at 90'. (E0)
18.(c)	(Area PAOB =) $2 \times \frac{12 \times 4}{2}$ or equivalent.  $= 48 \text{ (cm}^2\text{)}$	M1  A1	OR FT ' <u>their PA</u> ' $\times 4 + \frac{12 \times 4}{2}$ M0 for $48 \times 2$ or $12 \times 4 \times 2$ (= 96)  An unsupported final answer of 48 gains both marks. If no marks gained allow SC1 for sight of $24 \text{ (cm}^2\text{)}$ OR a correct evaluation of ' <u>their PA</u> ' $\times 4 / 2$ .
19.(a)	$y = 2.5x + 3$	B1	
19.(b)	$y = 3x - 5$	B1	
19.(c)	Line D	B1	



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# **GCSE MARKING SCHEME**

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**AUTUMN 2020**

**GCSE  
MATHEMATICS – UNIT 2 (INTERMEDIATE TIER)  
3300U40-1**

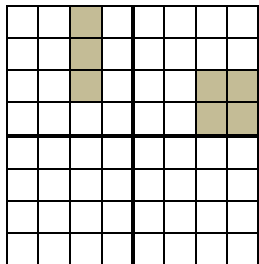
## **INTRODUCTION**

This marking scheme was used by WJEC for the 2020 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.

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**WJEC GCSE MATHEMATICS**  
**AUTUMN 2020 MARK SCHEME**

GCSE Mathematics Unit 2 Intermediate Tier	Mark	Comments
1.(a)(i) 16	B1	
1.(a)(ii) 2160	B2	B1 for sight of 2155(. . . . .) OR 2150 OR 2156. Mark final answer.
1.(b) $0.62 \times 7.8$ or equivalent. = 4.836 ISW	M1 A1	Unsupported 4.8.... implies M1. Accept $4^{209/250}$ (ISW). Allow 1209/250 (ISW)
1.(c)(i) 247	B1	
1.(c)(ii) 2197	B1	
2.(a) 6 -5	B2	B1 for 6. B1 FT for correct evaluation of 'their 6' – 11 <b>only</b> if it leads to a <u>negative</u> answer.
2.(b) 15	B2	B1 for sight of 28.8 OR -13.8. Mark final answer.
3. $\frac{400}{17.5}$ or $\frac{4}{0.175}$ . = 22.8(. . . .) or 22.9 (Number of rods =) 22	M2 A1 B1	M1 if incorrect place value (in either length). Digits 228.... implies M1. C.A.O. FT if of equivalent difficulty. (i.e. 'their 22.8' must be greater than 1 AND their 1 <sup>st</sup> decimal place number greater than or equal to 5.) Answer of 22 gains all 4 marks. Unsupported answer of 23 gains M2A0B0.
3. <u>Alternative method (trial and improvement)</u> Working with a multiple of 17.5 or 0.175. ( $n \times 17.5$ or $n \times 0.175$ ) $22 \times 17.5 (= 385)$ or $22 \times 0.175 (= 3.85)$ $23 \times 17.5 (= 402.5)$ or $23 \times 0.175 (= 4.025)$ (Number of rods =) 22	S1 B1 B1 B1	Award this S1 only if $n > 2$ and $n \neq 4$ and $n \neq 400$ . This implies previous S1. This implies previous S1 and previous B1 if 402.5 seen. Must be seen in answer space or unambiguously identified (not simply embedded). Answer of 22 gains all 4 marks. Unsupported answer of 23 gains S1B0B1B0.
4.(a) All labels correctly inserted (Number) 1 2 3 4 5 Red (Colour) Yellow (Pink) All outcomes correctly inserted	B1 B1	Must be inserted in the table and not simply inferred from the outcomes. Accept 'R' for Red and 'Y' for Yellow. Allow 'Red' for 'R' etc. Allow '1R' for 'R1' etc.
4.(b) $\frac{2}{15}$ or equivalent ISW.	B2	(No FT from an incorrect grid in 4a) B1 for a numerator of 2 in a fraction < 1. B1 for a denominator of 15 in a fraction < 1. Allow B2 for 0.13... Penalise -1 for incorrect notation eg '2 out of 15', '2 : 15' etc.
5.(a) 	B2	B1 for either individual shape. Ignore clearly deleted shading.

5.(b)	Reflection (in the line) $x = 5$	B2	B1 for stating 'Reflection'. Ignore extra wording once 'reflection' (or 'reflected') seen. B1 for stating $x = 5$ (simply drawing the line is B0)
6.(a)	$10x + 15 = 20$ OR $2x + 3 = 4$ $10x = 5$ OR $2x = 1$ $x = \frac{5}{10}$ OR $x = \frac{1}{2}$ or equivalent	B1 B1 B1	FT until 2 <sup>nd</sup> error.  Mark final answer. Allow an embedded answer but penalise -1 if contradicted by $x \neq \frac{1}{2}$ or 0.5.
6.(b)	$7(a + 3)$	B1	Allow $7(1a + 3)$ Mark final answer.
6.(c)	$5(n - 3)$ or $5 \times (n - 3)$ or $(n - 3)5$ or $(n - 3) \times 5$ or $5n - 15$	B2	B1 for sight of $n - 3 \times 5$ OR sight of $5 \times n - 3$ . B0 for unsupported $n - 15$ OR unsupported $5n - 3$ . Allow ' $n = 5(n - 3)$ ' etc Mark final answer.
7.(a)	<p>YES</p> <p>AND a valid explanation.</p> <p>e.g. 'the other two angles would be (both) <math>20^\circ</math>'</p> <p>e.g. diagram showing (isosceles) triangle with angles of <math>140^\circ</math>, <math>20^\circ</math> and <math>20^\circ</math>.</p>	E1	<p>A valid explanation implies YES circled if not otherwise contradicted (by circling NO).</p> <p>Explanations must engage with the specific triangle given (with an angle of <math>140^\circ</math>) and not isosceles triangles in general.</p>
7.(b)	<p>NO</p> <p>AND a valid explanation.</p> <p>e.g. '<math>120^\circ + 30^\circ \neq 180^\circ</math>'</p> <p>'the two angles add to <math>150^\circ</math>, not <math>180^\circ</math>'</p> <p>'<math>120^\circ + 30^\circ + 120^\circ + 30^\circ \neq 360^\circ</math>'</p> <p>'the four angles add to <math>300^\circ</math>, not <math>360^\circ</math>'</p>	E1	<p>Allow 'the two angles must equal <math>180^\circ</math>'.</p> <p>Do not accept 'the four angles must equal <math>360^\circ</math>' unless it is made clear that the rhombus has two pairs of equal angles.</p> <p>A valid explanation implies NO circled if not otherwise contradicted (by circling YES).</p>
7.(c)	$a + b = 150$	B1	
8.	$[n(G \cap S) =]$ 10 $[n(S) =]$ 13	B1 B1	<p>Entries must be a whole numbers.</p> <p><math>[n(E)]</math> must be 30 (i.e. no additional 'non-Spanish'). Any blank space to be taken as 0.</p>
9.	<p>(Length of AD or BC =) 10 (cm)</p> <p>(Area of ABCD = <math>5 \times 10</math> =) 50 (cm<sup>2</sup>)</p> <p>(Area APB =) <math>\frac{\pi \times 5^2}{4}</math></p> <p style="text-align: right;">= 19.6(.....)(cm<sup>2</sup>)</p> <p>(Shaded area = <math>50 - 19.6</math> =) 30.3(...) or 30.4(cm<sup>2</sup>)</p>	B1  B1  M1  A1  B1	<p>May be seen on the diagram or implied in later work.</p> <p>FT <math>5 \times</math> 'their AD (or BC)'.</p> <p>The 50(cm<sup>2</sup>) may be shown as two areas of 25(cm<sup>2</sup>) for B1 B1.</p> <p>SC1 for sight of <math>\pi \times 5^2</math> or equivalent (78.5....)</p> <p>FT 'their stated area ABCD' – 'their stated <u>area</u> APB'</p> <p><i>Note: Sight of (25 – 'area of APB') + 25 implies the first two B marks. [rectangle divided in half]</i></p>
9. OCW	<p>Organisation and Communication.</p> <p style="text-align: right;">Accuracy of writing.</p>	OC1          W1	<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 explanation 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>

10.(a)	$\frac{1}{6} \times \frac{1}{4}$ or equivalent $= \frac{1}{24}$ ISW	M1 A1	Accept 0.0416... or 0.0417 or 0.042 for M1A1 M1A0 for '1 in 24', '1:24'.
10.(b)	$\frac{1}{5} + \frac{1}{10}$ or equivalent. $= \frac{3}{10}$ or equivalent. ISW	M1 A1	
11.	$(AC^2 =) 10 \cdot 8^2 + 14 \cdot 4^2$ $AC^2 = 324$ or $(AC =) \sqrt{324}$ $(AC =) 18(\text{cm})$  $(\text{Area ACD} =) \frac{24 \times 18}{2}$ $= 216 (\text{cm}^2)$	M1 A1 A1   M1 A1	Accept equivalent of using cos rule (as $\cos 90 = 0$ ).  F.T. $\sqrt{\text{'their 324'}}$ provided M1 gained. Final answer of $AC = 324$ is M1A0A0. <u>Alternative method to find AC</u> A correct and complete method (using two trigonometric relationships) M2 $AC = 18(\text{cm})$ A1  FT 'their stated AC'. (May be shown on the diagram) Accept equivalent of using $\frac{1}{2} \times 24 \times 18 \times \sin 90$ (as $\sin 90 = 1$ ).
12.	One correct evaluation $7 \cdot 2 \leq x \leq 7 \cdot 3$ 2 correct evaluations $7 \cdot 275 \leq x \leq 7 \cdot 295$ , one $< 0$ , one $> 0$ . 2 correct evaluations $7 \cdot 275 \leq x \leq 7 \cdot 285$ , one $< 0$ , one $> 0$ .  $x = 7 \cdot 28$	B1 B1 M1 A1	Correct evaluation regarded as enough to identify if negative or positive. If evaluations not seen accept 'too high' or 'too low'. Look out for equating $x^3 - 5x = 350$ $\underline{x} \quad \underline{x^3 - 5x - 350}$ 7.2                    -12.75(2) 7.21                   -11(.2.. ) 7.22                   -9(.7...) 7.23                   -8(.2...) 7.24                   -6(.6...) 7.25                   -5(.1...) 7.26                   -3(.6...) 7.27                   -2(.1...) <b>7.28</b> <b>-0.5(7..)</b> <b>7.285</b> <b>0.1(9..)</b> <b>7.29</b> <b>0.9(7..)</b> 7.295        1(.7....) 7.3                   2.5(17)
13.(a)	an expression	B1	
13.(b)	an equation	B1	
14.	(Mid-points) 2.5, (7.5), 12.5 and 17.5. $8 \times 2.5 + (0 \times 7.5) + 7 \times 12.5 + 5 \times 17.5$ $(20 + 0 + 87.5 + 87.5 = 195)$  $\div 20$ $= 9.75$	B1 M1  m1 A1	Allow for sight of mid-points. F.T. 'their mid-points' including bounds, provided they fall within the classes (including lower and upper bounds and used consistently).  C.A.O.
15.	$(x =) \frac{360}{15}$ or $180 - \frac{(15 - 2) \times 180}{15}$ or equivalent $= 24(^{\circ})$  $(BR =) 8 \times \cos 24$ or $8 \times \sin (90 - 24)$  $= 7.3(0...)(\text{cm})$ or $7.31(\text{cm})$	M1  A1 M2  A1	May be seen in parts.  FT 'their stated value for x' ( $x < 90^{\circ}$ ) M1 for $\frac{BR}{8} = \cos 24$ or $\frac{BR}{8} = \sin (90 - 24)$ Accept equivalent of using sin rule (as $\sin 90 = 1$ ).  <u>Alternative method to find BR</u> A correct and complete method (using two trigonometric relationships and possibly Pythagoras's theorem) M2 $BR = 7.3(0...)(\text{cm})$ or $7.31(\text{cm})$ A1

16.	$2.656 \times 10^6$	B2	B1 for a correct value but not in standard form. Mark final answer. B1 for sight of 2 656 000. SC1 for $2.66 \times 10^6$ or $2.7 \times 10^6$ or $2.6 \times 10^6$ or $2.65 \times 10^6$
17.	Sight of 24.5 AND 15.5 OR Sight of 23.5 AND 14.5  $2(24.5 + 15.5) - 2(23.5 + 14.5)$ or equivalent  $= 4(\text{cm})$	B1  M1  A1	Sight of (Greatest =) 80 <u>OR</u> (Least =) 76 implies B1  FT only for upper bounds of 24.4 AND 15.4 or 24.49 AND 15.49 (lower bounds must be 23.5 AND 14.5 else M0)  CAO If M0, award B1 and an SC1 for sight of (Greatest =) 80 <u>AND</u> (Least =) 76
<u>Alternative method.</u> <i>Difference between least and greatest length for each side = 1(cm) <math>4 \times 1</math></i>  $= 4(\text{cm})$		B1  M1  A1	  FT only for differences of 0.9 or 0.99  CAO
18.	Method to eliminate variable e.g. equal coefficients with <u>appropriate</u> addition or subtraction. First variable found, $x = 4$ or $y = -1$ . Substitute to find the 2 <sup>nd</sup> variable. Second variable found	M1  A1 m1 A1	No marks for trial and improvement. Allow 1 error in one term, not the term with equal coefficients.  C.A.O. F.T. their '1 <sup>st</sup> variable'.  Award no marks for unsupported correct answers.
19.(a)(i)	Correct reason given. e.g. 'An angle at the circumference subtended by a diameter is a right angle'. 'line AC is a diameter'	E1	Accept any correct unambiguous wording. The key word is ' <u>diameter</u> '.  Allow eg 'angle in a semicircle is 90°', 'line AC goes through the centre'. 'opposite a diameter' Do not accept 'because it's a right angle'.
19.(a)(ii)	$\tan x = \frac{7.5}{4.7}$ $x = \tan^{-1}(7.5 / 4.7)$ or $\tan^{-1} 1.6$ or $\tan^{-1} 1.59(\dots)$  $= 57.9(\dots)(^\circ)$ or $57.8(\dots)(^\circ)$ or $58(^\circ)$	M1  m1  A1	Implies M1.  C.A.O. <u>Alternative method to find x</u> A correct and complete method (using Pythagoras's theorem and a trigonometric relationship). M2 $x = 57.9(\dots)(^\circ)$ or $57.8(\dots)(^\circ)$ or $58(^\circ)$ CAO A1
19.(b)	(y =) $58(^\circ)$  Correct circle theorem given. e.g. 'angles (at the circumference) subtended by the same chord (or arc) are equal', 'angles in the same segment (are equal)'.	B1  E1	<u>Strict</u> FT of 'their x'.  Accept any correct unambiguous wording. Allow eg 'angles on the same chord (are equal)' Do not accept e.g. 'they are equal' on its own.



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# **GCSE MARKING SCHEME**

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**AUTUMN 2020**

**GCSE  
MATHEMATICS – UNIT 1 (HIGHER TIER)  
3300U50-1**



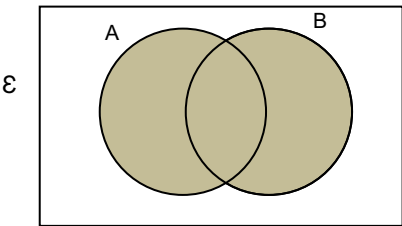
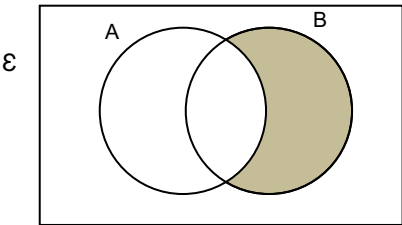
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**WJEC GCSE MATHEMATICS**  
**AUTUMN 2020 MARK SCHEME**

<b>GCSE Mathematics Unit 1: Higher Tier</b>		<b>Mark</b>	<b>Comments</b>
1.(a)	$5n - 3$	B2	B1 for sight of $5n$ . Mark final answer.
1.(b)	17	B1	
1.(c)	$2n + 2$ OR $2(n + 1)$	B2	If $2n + 2$ is not their final answer allow B1 for sight of $2n + 2$ in earlier work. B1 for a correct answer not simplified or incorrectly simplified e.g. $n + n + 2$ .
2.(a)(i)		B1	
2.(a)(ii)		B1	
2.(b)	A valid statement. e.g. 'all multiples of 6 are also multiples of 3' 'because 3 goes into 6', '6 is a multiple of 3'. '3 is a factor of 6'.	E1	Allow e.g. '(set) C is a subset of (set) A'. 'it is a multiple of 3' '6, 12, ... are also multiples of 3'.
3.(a)	9                      -7	B2	B1 for each.
3.(b)	At least 6 correct plots and no incorrect plot.  A smooth curve drawn through their plots.	P1  C1	FT 'their (-2,9)' and 'their (2,-7)' Allow $\pm \frac{1}{2}$ a small square'. FT 'their 8 plots'. OR a curve through the 6 given points and (-2,9) and (2,-7). Allow intention to pass through their plots. ( $\pm 1$ small square horizontal or vertical.)
3.(c)	Line $y = 1$ drawn  -0.8 AND 4.8	B1  B1	Must be at least 2cm long.  FT intersection of 'their curve' with 'their $y = 1$ ' only if exactly two points of intersection and $y \neq 0$ .  If curve drawn, but no line drawn, allow a FT from intersection of 'their curve' with the line $y = 1$ only if exactly two points of intersection for B0 B1. Allow $\pm 1$ small square'.

4. (One part =) (£)210 ÷ 3  = (£)70  (Total amount =) 14 × (£)70 OR (£)210 + 4 × (£)70 + 7 × (£)70  = (£)980	M1 A1  m1  A1	FT ‘their (£)70’ only if M1 gained. Allow m1 for sight of 210 AND 280 AND 490 together as the three shares.  <i>For 210 ÷ 3 × 14 M3 = 980 A1</i>
Organisation and Communication.  		



<p>12. <math>6(2x + 1) - 4(3x - 5)</math> as a <u>numerator</u> within a single fraction</p> <p><math>(3x - 5)(2x + 1)</math> as a <u>denominator</u></p> <p><math>h26 / (3x - 5)(2x + 1)</math></p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>Allow intention of brackets, e.g. <math>6 \times 2x + 1 - 4 \times 3x - 5</math></p> <p>CAO.</p> <p>Allow <math>26 / (6x^2 - 7x - 5)</math></p> <p>(If expanded, the denominator must be correct.)</p> <p>If M1 M1 A1, penalise further incorrect work -1.</p> <p>If no marks awarded, then SC1 for sight of 26.</p>
<p>13. (Linear scale factor =) <math>\sqrt[3]{1280 / 20}</math> (= 4)</p> <p><math>\sqrt[3]{1280 / 20} \times 2.3</math></p> <p>= 9.2 (cm)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Or equivalent.</p> <p>Accept a method based on ratios e.g. <math>1 : 4</math> (from <math>20 : 1280 = 1 : 64 = 1 : 4^3</math>)</p> <p>FT their derived scale factor (from <math>\sqrt[3]{}</math>).</p> <p>SC1 for an answer of 18.4 (using s.f. of 8, from <math>\sqrt[3]{64}</math>).</p>
<p><u>Alternative method (using reciprocal scale factor)</u></p> <p>(Linear scale factor =) <math>\sqrt[3]{20 / 1280}</math> (= 1 / 4)</p> <p><math>2.3 \div \sqrt[3]{20 / 1280}</math> OR <math>1 / \sqrt[3]{20 / 1280} \times 2.3</math></p> <p>= 9.2 (cm)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Or equivalent.</p> <p>Accept a method based on ratios.</p> <p>FT their derived scale factor (from <math>\sqrt[3]{}</math>).</p>
<p>14. (a) <math>10x = 8.121212.....</math> and <math>1000x = 812.1212....</math> <u>with</u> an attempt to subtract on both sides</p> <p><math>804/990</math> (= <math>402/495 = 134/165</math>)</p>	<p>M1</p> <p>A1</p>	<p>Or x and 100x, or equivalent. Or a <u>complete</u> alternative method.</p> <p>An answer of <math>80.4/99</math> gains M1 only.</p> <p>ISW</p>
<p><u>Alternative method</u></p> <p><math>0.8 + 0.0121212..... = 8/10 + 12/990</math> or equivalent</p> <p><math>804/990</math> (= <math>402/495 = 134/165</math>)</p>	<p>M1</p> <p>A1</p>	<p>ISW</p>
<p>14. (b) <math>6\sqrt{2}</math></p>	<p>B1</p>	
<p>14. (c) <math>7 \times 3 + 7\sqrt{5} - 3 \times 2\sqrt{5} - 2(\sqrt{5})^2</math> or equivalent</p> <p>= <math>11 + \sqrt{5}</math></p>	<p>M1</p> <p>A1</p>	<p>Mark final answer.</p> <p>Accept <math>11 + 1\sqrt{5}</math>.</p> <p>If no marks awarded, SC1 for 3 correctly simplified terms i.e. 21, <math>7\sqrt{5}</math>, <math>-6\sqrt{5}</math>, -10.</p>
<p>15.</p> <ul style="list-style-type: none"> <li><math>FG = HG</math> (since G is the midpoint of FH)</li> <li>EG is a common side</li> <li>Angle EGF = Angle EGH (since EG and FH are perpendicular)</li> </ul> <p>SAS (or two sides and the <u>included</u> angle) so that EFG and EHG are congruent triangles.</p>	<p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p>	<p>Do not accept indications on the diagram.</p> <p>FT from B2 previously awarded. Must be convincing.</p> <p>Do not allow 'two sides and an angle'.</p>
<p><u>Allow alternative method</u></p> <ul style="list-style-type: none"> <li><math>FG = HG</math> (since G is the midpoint of FH)</li> <li>EG is a common side</li> <li><math>EF = EH</math> using Pythagoras</li> </ul> <p>SSS (or all corresponding sides equal) so that EFG and EHG are congruent triangles.</p>	<p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p>	<p>Do not accept indications on the diagram.</p> <p>Must be convincing. An unsupported statement that <math>EF = EH</math>, or that triangle is 'isosceles', is insufficient.</p> <p>FT from B2 previously awarded. Allow RHS.</p> <p>Must be convincing.</p>



19. (a) $1/11 \times 6/10$ or equivalent  $= 6/110 (= 3/55)$	M1  A1	ISW
19. (b) $6/11 \times 5/10 + 4/11 \times 3/10 [+ 1/11 \times 0/10]$  $= 42/110 (= 21/55)$	M2  A1	FT use of consistent incorrect denominator e.g. 120 Full method for finding $P(R, R) + P(G, G) [+ P(Y, Y)]$ M1 for sight of $6/11 \times 5/10$ or $4/11 \times 3/10$ ISW If no marks, SC1 for an answer of 53/121 (method with replacement)
19. (c) $1 - 7/11 \times 6/10$ or equivalent  $= 68/110 (= 34/55)$	M2  A1	FT use of consistent incorrect denominator e.g. 120 M1 for $7/11 \times 6/10$ ISW
<u>Alternative method 1</u> $1 - [6/11 \times 5/10 + 6/11 \times 1/10 + 1/11 \times 6/10]$ or equivalent  $= 68/110 (= 34/55)$	M2  A1	FT use of consistent incorrect denominator e.g. 120 Full method for finding $1 - [P(R, R) + P(R, Y) + P(Y, R)]$ . Allow M1 if any one of the three subtracted products is omitted. ISW
<u>Alternative method 2</u> $4/11 \times 3/10 + 4/11 \times 7/10 + 7/11 \times 4/10$ or equivalent  $= 68/110 (= 34/55)$	M2  A1	FT use of consistent incorrect denominator e.g. 120 Full method for finding $P(G, G) + P(G, G') + P(G', G)$ . Allow M1 for the <b>sum</b> of any two of these three products  NB: $P(1^{st} \text{ sock green})$ is equivalent to $P(G, G) + P(G, G')$ or to $P(G, G) + P(G', G)$ (i.e. credit cannot be given for <u>only</u> $P(1^{st} \text{ sock green}) = 4/11$ without considering compound events) ISW
<u>Alternative method 3</u> $4/11 \times 3/10 + 4/11 \times 6/10 + 4/11 \times 1/10 + 6/11 \times 4/10 + 1/11 \times 4/10$ or equivalent  $= 68/110 (= 34/55)$	M2  A1	FT use of consistent incorrect denominator e.g. 120 Full method for finding $P(G, G) + P(G, R) + P(G, Y) + P(R, G) + P(Y, G)$ . Allow M1 for the <b>sum</b> of any two of the following <ul style="list-style-type: none"> <li><math>P(G, G)</math></li> <li><math>P(G, R) + P(G, Y)</math></li> <li><math>P(R, G) + P(Y, G)</math></li> </ul> NB: $P(1^{st} \text{ sock green})$ is equivalent to $P(G, G) + P(G, R) + P(G, Y)$ or to $P(G, G) + P(R, G) + P(Y, G)$ (i.e. credit cannot be given for <u>only</u> $P(1^{st} \text{ sock green}) = 4/11$ without considering compound events) ISW
		If no marks, SC1 for an answer of 72/121 [from $1 - 7/11 \times 7/11$ ] (method with replacement)



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# **GCSE MARKING SCHEME**

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**AUTUMN 2020**

**GCSE  
MATHEMATICS – UNIT 2 (HIGHER TIER)  
3300U60-1**



## **INTRODUCTION**

This marking scheme was used by WJEC for the 2020 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.

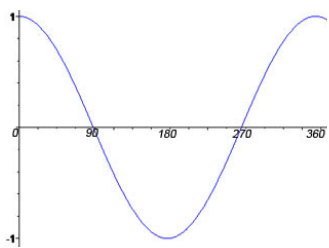
WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

**WJEC GCSE MATHEMATICS**  
**AUTUMN 2020 MARK SCHEME**

GCSE Mathematics Unit 2 Higher Tier		Mark	Comments																																																
1.(a)	$\frac{1}{6} \times \frac{1}{4}$ or equivalent $= \frac{1}{24}$ ISW	M1 A1	Accept 0.0416... or 0.0417 or 0.042 for M1A1 M1A0 for '1 in 24', '1:24'.																																																
1.(b)	$\frac{1}{5} + \frac{1}{10}$ or equivalent. $= \frac{3}{10}$ or equivalent. ISW	M1 A1																																																	
2.	$(AC^2 =) 10 \cdot 8^2 + 14 \cdot 4^2$ $AC^2 = 324$ or $(AC =) \sqrt{324}$ $(AC =) 18(\text{cm})$  $(\text{Area ACD} =) \frac{24 \times 18}{2}$ $= 216 (\text{cm}^2)$	M1 A1 A1  M1 A1	Accept equivalent of using cos rule (as $\cos 90 = 0$ ). F.T. $\sqrt{\text{'their 324'}}$ provided M1 gained. Final answer of $AC = 324$ is M1A0A0. <u>Alternative method to find AC</u> <i>A correct and complete method (using two trigonometric relationships)</i> M2 $AC = 18(\text{cm})$ A1  FT 'their stated AC'. (May be shown on the diagram) Accept equivalent of using $\frac{1}{2} \times 24 \times 18 \times \sin 90$ (as $\sin 90 = 1$ ).																																																
Organisation and Communication		OC1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> <li>present their response in a structured way</li> <li>explain to the reader what they are doing at each step of their response</li> <li>lay out their explanation 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>																																																
Accuracy of writing		W1	For W1, candidates will be expected to: <ul style="list-style-type: none"> <li>show all their working</li> <li>make few, if any, errors in spelling, punctuation and grammar</li> <li>use correct mathematical form in their working</li> <li>use appropriate terminology, units, etc.</li> </ul>																																																
3.	One correct evaluation $7 \cdot 2 \leq x \leq 7 \cdot 3$ 2 correct evaluations $7 \cdot 275 \leq x \leq 7 \cdot 295$ , one $< 0$ , one $> 0$ . 2 correct evaluations $7 \cdot 275 \leq x \leq 7 \cdot 285$ , one $< 0$ , one $> 0$ .  $x = 7 \cdot 28$	B1 B1 M1 A1	<i>Correct evaluation regarded as enough to identify if negative or positive. If evaluations not seen accept 'too high' or 'too low'.</i> <i>Look out for equating <math>x^3 - 5x = 350</math></i> <table> <tr> <td><math>x</math></td><td><math>x^3 - 5x - 350</math></td><td></td><td></td></tr> <tr> <td>7.2</td><td>-12.75(2)</td><td></td><td></td></tr> <tr> <td>7.21</td><td>-11(.2..)</td><td></td><td></td></tr> <tr> <td>7.22</td><td>-9(.7...)</td><td></td><td></td></tr> <tr> <td>7.23</td><td>-8(.2...)</td><td></td><td></td></tr> <tr> <td>7.24</td><td>-6(.6...)</td><td></td><td></td></tr> <tr> <td>7.25</td><td>-5(.1...)</td><td></td><td></td></tr> <tr> <td>7.26</td><td>-3(.6...)</td><td>7.275</td><td>-1(.3....)</td></tr> <tr> <td>7.27</td><td>-2(.1...)</td><td>7.284</td><td>0(.04..)</td></tr> <tr> <td><b>7.28</b></td><td><b>-0.5(7..)</b></td><td><b>7.285</b></td><td><b>0.1(9..)</b></td></tr> <tr> <td><b>7.29</b></td><td><b>0.9(7..)</b></td><td>7.295</td><td>1(.7....)</td></tr> <tr> <td>7.3</td><td>2.5(17)</td><td></td><td></td></tr> </table>	$x$	$x^3 - 5x - 350$			7.2	-12.75(2)			7.21	-11(.2..)			7.22	-9(.7...)			7.23	-8(.2...)			7.24	-6(.6...)			7.25	-5(.1...)			7.26	-3(.6...)	7.275	-1(.3....)	7.27	-2(.1...)	7.284	0(.04..)	<b>7.28</b>	<b>-0.5(7..)</b>	<b>7.285</b>	<b>0.1(9..)</b>	<b>7.29</b>	<b>0.9(7..)</b>	7.295	1(.7....)	7.3	2.5(17)		
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4.(a)	an expression	B1	
4.(b)	an equation	B1	
5.	(Mid-points) 2.5, (7.5), 12.5 and 17.5. $8 \times 2.5 + (0 \times 7.5) + 7 \times 12.5 + 5 \times 17.5$ $(20 + 0 + 87.5 + 87.5 = 195)$ $\div 20$ $= 9.75$	B1 M1  m1 A1	Allow for sight of mid-points. F.T. 'their mid-points' including bounds, provided they fall within the classes (including lower and upper bounds and used consistently).  C.A.O.
6.	( x = ) $\frac{360}{15}$ or $180 - \frac{(15 - 2) \times 180}{15}$ or equivalent $= 24(^{\circ})$ (BR = ) $8 \times \cos 24$ or $8 \times \sin (90 - 24)$ $= 7.3(0...)(\text{cm})$ or $7.31(\text{cm})$	M1  A1 M2  A1	May be seen in parts.  FT 'their stated value for x' ( x < 90°) M1 for $\frac{BR}{8} = \cos 24$ or $\frac{BR}{8} = \sin (90 - 24)$ Accept equivalent of using sin rule (as sin 90 = 1).  <u>Alternative method to find BR</u> A correct and complete method (using two trigonometric relationships and possibly Pythagoras's theorem) BR = $7.3(0...)(\text{cm})$ or $7.31(\text{cm})$ M2 A1
7.	$2.656 \times 10^6$	B2	B1 for a correct value but not in standard form. Mark final answer. B1 for sight of 2 656 000. SC1 for $2.66 \times 10^6$ or $2.7 \times 10^6$ or $2.6 \times 10^6$ or $2.65 \times 10^6$
8.	Sight of 24.5 AND 15.5 OR Sight of 23.5 AND 14.5  $2(24.5 + 15.5) - 2(23.5 + 14.5)$ or equivalent  $= 4(\text{cm})$	B1  M1  A1	Sight of (Greatest =) 80 <u>OR</u> (Least =) 76 implies B1  FT only for upper bounds of 24.4 AND 15.4 or 24.49 AND 15.49 (lower bounds must be 23.5 AND 14.5 else M0)  CAO If M0, award B1 and an SC1 for sight of (Greatest =) 80 <u>AND</u> (Least =) 76
<u>Alternative method.</u> Difference between least and greatest length for each side = 1(cm) $4 \times 1$ $= 4(\text{cm})$		B1 M1 A1	 FT only for differences of 0.9 or 0.99  CAO
9.	Method to eliminate variable e.g. equal coefficients with <u>appropriate</u> addition or subtraction. First variable found, x = 4 or y = -1. Substitute to find the 2 <sup>nd</sup> variable. Second variable found	M1  A1 m1 A1	No marks for trial and improvement. Allow 1 error in one term, not the term with equal coefficients.  C.A.O. F.T. their '1 <sup>st</sup> variable'.  Award no marks for unsupported correct answers.



16. Use of 7175 AND $(1 \cdot 2345 \text{ or } (1)23 \cdot 45(\div 100)$ $7175 \times 1 \cdot 2345$  $= (\pounds)8858$	B1 M1  A1	Or equivalent complete method. FT for 'their 7175' provided $7170 \leq x < 7180$ and 'their 1·2345' provided $1 \cdot 234 \leq y < 1 \cdot 235$ Sight of $(\pounds)8857 \cdot 53(75)$ or $(\pounds)8857 \cdot 54$ implies B1M1. CAO.
17.(a) General cosine <u>curve</u> with appropriate orientation and position.  Correct sketch with curve passing through $(0^\circ, 1)$ , $(90^\circ, 0)$ and $(270^\circ, 0)$ and approximately $(180^\circ, -1)$ and $(360^\circ, 1)$ AND $90^\circ$ , $180^\circ$ , $270^\circ$ , $360^\circ$ indicated on the x-axis AND -1 and 1 indicated on the y-axis.  	M1  A1	Ignore curve shown for values $x < 0^\circ$ or $x > 360^\circ$ .  Accept $180^\circ$ as mid-way between $0^\circ$ and $360^\circ$ if unlabelled. Accept $360^\circ$ as unlabelled provided the sketch does not exceed $360^\circ$ .
17.(b) $46^\circ$ AND $314^\circ$ OR $45 \cdot 6^\circ$ AND $314 \cdot 4^\circ$ OR $45 \cdot 57(29 \dots)^\circ$ AND $314 \cdot 4(27 \dots)^\circ$ .	B2	B1 for sight of one correct angle. Allow embedded answers. If more than two answers offered award B1 for sight of one correct angle.  If no marks, awarded SC1 for truncated answers $45^\circ$ AND $315^\circ$ OR $45 \cdot 5^\circ$ AND $314 \cdot 5^\circ$ .
18. $0 \cdot 7 \times 0 \cdot 2 \times 0 \cdot 1 \times 6$  $= 0 \cdot 084$ or equivalent	M2  A1	M1 for sight of $0 \cdot 7 \times 0 \cdot 2 \times 0 \cdot 1$ OR $0 \cdot 014$ OR $7/500$ or equivalent. Fractional answer: $21/250$ or equivalent. (ISW)
19. Sight of $25x^2 + 15x - 15x - 9$ $25x^2 - 19x - 9 = 0$  $x = \frac{-(-19) \pm \sqrt{(-19)^2 - 4 \times 25 \times (-9)}}{2 \times 25}$  $x = \frac{19 \pm \sqrt{1261}}{50}$  $x = 1 \cdot 09$ with $x = -0 \cdot 33$ (answers to 2dp)	B1 B1  M1  A1  A1	Or equivalent. '= 0' required, but may be implied by an attempt to use the quadratic formula or if $a = 25$ , $b = -19$ , $c = -9$ used in the quadratic formula.  <b>This substitution into the formula must be seen for M1, otherwise award M0A0A0.</b> FT 'their derived quadratic equation' of equivalent difficulty ( $a$ , $b$ and $c$ must be non-zero). Allow one slip in substitution <b>for M1 only</b> , but must be correct formula.  Can be implied from at least one correct value of $x$ evaluated, provided M1 awarded.  CAO for their quadratic equation.

<p>20.</p> $(x =) \frac{12}{\sin 46} \times \sin 34$ $(x =) 9.3(28\dots\text{cm}) \text{ OR } 9.32(\text{cm})$ $(\text{Area of sector ACB} =) \frac{46}{360} \times \pi \times 9.3(28\dots)^2$ $= 34.9(3\dots\text{cm}^2)$ $(\text{Area of ACE} =) \frac{1}{2} \times 9.3(28\dots) \times 12 \times \sin(100)$ $= 55.1(2\dots\text{cm}^2)$ $(\text{Area of the shaded region BCE} = 55.1\dots - 34.9\dots)$ $= 20.18(8\dots\text{cm}^2) \text{ OR } 20.2(\text{cm}^2)$		<p>A correct and complete method involving multiple trigonometric relationships leading to the correct answer may be seen at any stage to gain the method mark(s).</p> <p>M2 M1 for <math>\frac{x}{\sin 34} = \frac{12}{\sin 46}</math> or equivalent.</p> <p>A1</p> <p>M1 FT 'their derived 9.3(28...)'. A1 Answers in the range 34.7(cm<sup>2</sup>) to 35(cm<sup>2</sup>) or equivalent range on FT.</p> <p>M1 FT 'their derived 9.3(28...cm)' A1 Answers in the range 54.95(cm<sup>2</sup>) to 55.13(cm<sup>2</sup>) or equivalent range on FT.</p> <p>B1 FT 'their 34.9(...cm<sup>2</sup>)' and 'their 55.1(...cm<sup>2</sup>)' provided previous M1, M1 (from area calculations) awarded AND 'area of the shaded region' &gt; 0. This answer must be derived from the subtraction of 'their areas'.</p>
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