



GCSE MARKING SCHEME

AUTUMN 2020

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

INTRODUCTION

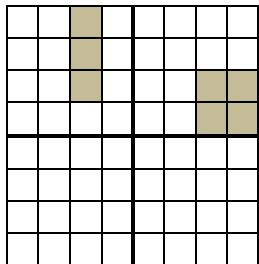
This marking scheme was used by WJEC for the 2020 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' 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.

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 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) 0.62×7.8 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 only 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 st 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> <i>Working with a multiple of 17.5 or 0.175.</i> ($n \times 17.5$ 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	<i>Award this S1 only if</i> <i>$n > 2$ and $n \neq 4$ and $n \neq 400$.</i> <i>This implies previous S1.</i> <i>This implies previous S1 and previous B1 if 402.5 seen.</i> <i>Must be seen in answer space or unambiguously identified (not simply embedded).</i> <i>Answer of 22 gains all 4 marks.</i> <i>Unsupported answer of 23 gains S1B0B1B0.</i>
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	(<u>No FT from an incorrect grid in 4a</u>) 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.

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(cm) (Area ACD =) $\frac{24 \times 18}{2}$ $= 216 \text{ (cm}^2\text{)}$	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(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 $7.2 \leq x \leq 7.3$ 2 correct evaluations $7.275 \leq x \leq 7.295$, one < 0, one > 0. 2 correct evaluations $7.275 \leq x \leq 7.285$, one < 0, one > 0. $x = 7.28$	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 $x^3 - 5x = 350$ $x \quad \quad \quad x^3 - 5x - 350$ 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...) 7.28 -0.5(7..) 7.285 0.1(9..) 7.29 0.9(7..) 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°) 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. 2.656×10^6	B2	B1 for a correct value but not in standard form. Mark final answer. B1 for sight of 2 656 000. SC1 for 2.66×10^6 or 2.7×10^6 or 2.6×10^6 or 2.65×10^6
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)</i> 4×1 $= 4(\text{cm})$	B1 M1 A1	No marks for trial and improvement. 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 nd 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 st 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(°) 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	Strict 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.