



GCSE MARKING SCHEME

SUMMER 2019

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

INTRODUCTION

This marking scheme was used by WJEC for the 2019 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 (NEW)

SUMMER 2019 MARK SCHEME

GCSE Mathematics Unit 2: Intermediate Tier	Mark	Comments												
1.(a)(i) $28 \cdot 34$ or $1417/50$ or $28^{17/50}$ ISW	B2	B1 for sight of $23 \cdot 04$ OR sight of $5 \cdot 3$. If B0 allow SC1 for 28 or $28 \cdot 3$												
1.(a)(ii) $34 \cdot 8$ or $174/5$ or $34^{4/5}$ ISW	B1													
1.(a)(iii) 125	B2	B1 for sight of $1/8$ or $0 \cdot 125$ or $1000/8$ or $1000 \div 8$												
1.(b) 440	B1	B0 for $440 \cdot 0$												
2.(a) $(19 - 18 \cdot 2 =)$ 0.8	B2	B1 for sight of 19 OR sight of $-18 \cdot 2$. BUT B0 for $19f - 18 \cdot 2g$. Mark final answer.												
2.(b) $7x = 16$ $(x =) 16/7$ $(x =) 2 \cdot 3$ (to 1dp)	B1 B1 B1	FT from $7x = k$. Allow $16 \div 7$ FT from any fraction that requires rounding. Mark final answer. $(x =) 2 \cdot 2 \dots$ implies B1B1B0. Allow an embedded $2 \cdot 3$, B1B1B0												
3.(a) 4 hours 45 min	B1													
3.(b) 2.4 km	B1													
3.(c) <table border="1"> <tr> <td>7km less than 5 miles</td> <td>TRUE</td> <td></td> </tr> <tr> <td>1kg less than 2lb</td> <td></td> <td>FALSE</td> </tr> <tr> <td>1 litre less than 1 pint</td> <td></td> <td>FALSE</td> </tr> <tr> <td>8 litres less than 900cm^3</td> <td></td> <td>FALSE</td> </tr> </table>	7km less than 5 miles	TRUE		1kg less than 2lb		FALSE	1 litre less than 1 pint		FALSE	8 litres less than 900cm^3		FALSE	B2	For all 4 correct. B1 for 3 correct.
7km less than 5 miles	TRUE													
1kg less than 2lb		FALSE												
1 litre less than 1 pint		FALSE												
8 litres less than 900cm^3		FALSE												
4. Two relevant (sides of one double the other) rectangles or squares considered. Perimeter AND area of 1 st rectangle correctly calculated. Perimeter AND area of 2 nd rectangle correctly calculated. Clear statement that the perimeter has been doubled but the area has not been doubled (and that Catrin is incorrect.)	M1 B1 B1 A2	Sketch shown or lengths stated. If M0, only the B marks are available. Ignore missing units BUT penalise -1, once only, for incorrect units. (Applies to these B1 marks.) FT 'their <u>stated</u> values' for both perimeter and area. If not A2, then A1 for correct perimeter statement for 'their <u>values</u> '. OR A1 for correct area statement for 'their <u>values</u> '. Accept statement that area is 4 times as big. Allow for A2 'only the perimeter has been doubled'. (implies that the area has not been doubled.) <u>Also for A2.</u> 'The area is not doubled so Catrin is incorrect' answers the question. In this case Award SC1 and SC1 (instead of B1 and B1) if areas correctly calculated. Correct statements, for BOTH perimeter and area, with no supporting work gains SC1.												

5. (18% of £256 =) 0.18×256 $= (£)46.08$ (Larger share =) $\frac{2 \times 46.08}{3}$ $= (£)30.72$ (To the nearest 10p =) (£)30.7(0)	M1 A1 M1 A1 B1	Allow (£)46.10 FT 'their stated 18%'. If M0 allow SC1 for sight of (£)15.36 FT 'their larger share' (not 'their 18%') and only if rounding required.
5. <u>Alternative method 1</u> (Larger share of £256 =) $\frac{2 \times 256}{3}$ $= (£)170.66(\dots)$ (18% of £170.66 =) 0.18×170.66 $= (£)30.72$ (To the nearest 10p =) (£)30.7(0)	M1 A1 M1 A1 B1	Allow (£)170.70 If M0 allow SC1 for sight of (£)85.33. FT 'their stated larger share'. FT 'their 18%' (not 'their larger share') and only if rounding required.
5. <u>Alternative method 2</u> (Larger share of 18% =) $\frac{2 \times 18}{3}$ $= 12(\%)$ (12% of £256 =) 0.12×256 $= (£)30.72$ (To the nearest 10p =) (£)30.7(0)	M1 A1 M1 A1 B1	If M0 allow SC1 for sight of 6(%) FT 'their derived larger %'. FT 'their amount' only if rounding required.
5.OCW Organisation and Communication. Accuracy of writing.	OC1 W1	For OC1, candidates will be expected to: • 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 For W1, candidates will be expected to: • 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
6.(a) $a(7b+11)$	B1	Allow $1a(7b + 11)$
6.(b) $x(x-8)$	B1	Allow $1x(x - 8)$
6.(c) $8y - 12y^2$	B2	Must be an expression for B2. B1 for sight of $8y$ or $-12y^2$. Mark final answer.
7.(a) $a = -6$ $b = -5$	B1 B1	Values may be seen on the diagram.
7.(b) Correct shape in correct position.	B3	B2 for a correct enlargement in incorrect position. B1 for one correct side in correct position. If no marks allow SC1 for showing <u>all</u> the 'rays' from (1,2).

8. $P(\text{Alison chooses letter R}) = 2/10$ or equivalent. $P(\text{Sarfraz chooses letter R}) = 1/4$ or equivalent. Use of $2/10 \times 100$ OR $1/4 \times 100$ 20 AND 25 clearly implying that Sarfraz is the most likely to choose letter R	B1 B1 M1 A1	B1 for sight of $2/10$ if unambiguously for Alison. B1 for sight of $1/4$ if unambiguously for Sarfraz. As probability not asked for, allow e.g. '2 chances in 10' and 'one chance in four'. B1 marks may be implied in subsequent work. Calculation may be done in stages. There is no requirement to tick the box as long as there is no contradiction. Do <u>not</u> accept, on its own, e.g. 'Sarfraz has less letters to choose from' for the A1.
<u>8. Alternative method</u> $P(\text{Alison chooses letter R}) = 2/10$ or equivalent. $P(\text{Sarfraz chooses letter R}) = 1/4$ or equivalent. Attempting to give probabilities in a common format. Correct common format e.g. $4/20$ AND $5/20$ or 0.2 AND 0.25 clearly implying that Sarfraz is the most likely to choose letter R	B1 B1 M1 A1	B1 for sight of $2/10$ if unambiguously for Alison. B1 for sight of $1/4$ if unambiguously for Sarfraz. As probability not asked for, allow e.g. '2 chances in 10' and 'one chance in four' There is no requirement to tick the box as long as there is no contradiction. Do <u>not</u> accept, on its own, e.g. 'Sarfraz has less letters to choose from' for the A1.
9.(a) $3n + 5$ or equivalent	B2	B1 for sight of $3n$. B0 for $-3n$ Mark final answer.
9.(b) $3t = r + 8$ or $r + 8 = 3t$ or $-3t = -r - 8$ $t = \frac{r+8}{3}$ or $\frac{r+8}{3} = t$ or $t = \frac{-r-8}{-3}$	B1 B1	F.T. only from $3t = \pm r \pm 8$, stated or implied. ($3t = r + 8$ will have already gained the previous B1.) B1B0 for $-t = \frac{-r-8}{3}$ or equivalent. Mark final answer. <u>Note</u> Allow B1B0 for $t = (r + 8) \div 3$ with or without brackets. Allow B1B0 for $\frac{r+8}{3}$ ('t' missing)
9.(c) $6x + 4 = 46$ OR $3x + 2 = 23$ $6x = 42$ OR $3x = 21$ ($x =$) 7	B2 B1 B1	B1 for $(x + 5) + (2x - 3) + (x + 5) + (2x - 3) = 46$ or equivalent e.g. $(x + 5) + (2x - 3) = 23$ FT collection of 'their terms' if of equivalent difficulty. (linear equation only.) FT <u>only</u> from $ax = b$. Allow a fraction from a FT value unless x is a whole number. ($x =$) 7 gains all four marks. Each B mark implies all previous B marks. Mark final answer.
<u>9.(c) Alternative method</u> A trial showing correct values and understanding of perimeter. (e.g. $2(4 + 5) + 2(2 \times 4 - 3) = 28$) An <u>improved</u> trial. ($x =$) 7	B1 B1 B2	Consistent use of x AND correct evaluation. Dependent on first B1. If 1st trial is using '7' award B1B1 followed by B1 if left embedded but B2 if shown as $x = 7$. B1 for an implied / embedded '$x = 7$' but not shown as $x = 7$. ($x =$) 7 gains all four marks. Mark final answer.

10. Intent to square at least two of the three values. Comparing $(25.6)^2$ with $(12.8)^2 + (22.7)^2$ or Any intent to compare any other relevant values. (e.g. $(25.6)^2 - (22.7)^2$ with $(12.8)^2$ or $\sqrt{[(12.8)^2 + (22.7)^2]}$ (with 25.6)) Correct evaluation of value(s) to be compared. (e.g 'sight of 655.36 WITH 679.13' or 'sight of 140.07 WITH 163.84' or 'sight of 26.06 (WITH 25.6)') Statement that it is NOT possible	S1 M1 A1 A1	(Note: $12.8^2 = 163.84$, $22.7^2 = 515.29$ and $25.6^2 = 655.36$) The comparison attempted must show <u>both</u> intended calculations e.g. $(25.6)^2$ AND $(12.8)^2 + (22.7)^2$ unless intention is to compare with a given side e.g. $\sqrt{[(12.8)^2 + (22.7)^2]}$ with 25.6 C.A.O. but allow evaluated answers to be given to the nearest whole number. e.g. 655 WITH 679. Allow FT if M1 awarded. <i>If all marks gained ISW.</i>
<u>10. Alternative method 1</u> <i>Intent to use two right-angled trig ratios using 2 different pairs of given sides</i> <i>Correct right-angled trig ratio used twice, using 2 different given sides, in order to compare</i> - the values of the same angle or - the sum of the two angles with 90°. <i>Correct evaluation of value(s) to be compared.</i> e.g. sight of any two of 30° , $27.5\dots^\circ$ and $29.4\dots^\circ$ OR sight of 30° and $60.58\dots^\circ$ (and the sum to be compared with 90°) 		

13. (number of females in Porth =) $\frac{90}{360} \times 128$ OR (number of males in Porth =) $\frac{120}{360} \times 72$ (number of females in Porth =) 32 (number of males in Porth =) 24 (Probability from Porth =) $\frac{56}{200}$ or equivalent ISW	M1 A1 A1 A1	Or equivalent <i>Answers may be seen on the diagram.</i> An answer of 32 implies M1. An answer of 24 implies M1. FT ('their 32' + 'their 24') /200 provided M1 gained. Penalise incorrect notation –1. e.g. '56 in 200'.																																																
14. $\sin(QPR) = \frac{9.6}{16.7}$ (QPR =) $\sin^{-1}(9.6/16.7)$ or $\sin^{-1}(0.57..)$ = 35.1(°) or 35.09(°) or 35.089(...°)	M1 m1 A1	 Implies M1. Allow any answer that rounds to 35(°)																																																
14. <u>Alternative method.</u> Correct use of 'two-step' method. (x) = 35.1(°) or 35.09(°) or 35.089(...°)	M2 A1	<i>A partial trigonometric method is M0.</i> Allow any answer that rounds to 35(°)																																																
15. $7x + 2y = (£)41.5(0)$ AND $4x + 3y = (£)29.75$ Method to eliminate variable (Attempt at equal coefficients and subtraction) First variable found $x = (£) 5$ or $y = (£)3.25$. Substitute to find the 2 nd variable. Second variable found.	B1 M1 A1 m1 A1	Allow use of other letters to denote variables. B0 for using 4150 and 2975. FT 'their equations' if of equal difficulty. Allow 1 error in one term, not one with equal coefficients. C.A.O. (for their equations if FT.) F.T. their '1 st variable'. FT answers should be given to the nearest penny (rounded or truncated). If M0, award SC2 (with possible B1) for <u>both</u> answers of (£) 5 AND (£)3.25.																																																
16. One correct evaluation $1 \leq x \leq 2$ 2 correct evaluations $1.55 \leq x \leq 1.75$, one < 0, one > 0. 2 correct evaluations $1.55 \leq x \leq 1.65$, one < 0, one > 0. $x = 1.6$	B1 B1 M1 A1	<i>Correct evaluation regarded as enough to identify if 'too high' or 'too low'. If evaluations not seen accept 'too high' or 'too low'.</i> <table><tr><td>x</td><td>$2x^3 + x - 10$ (or check $2x^3 + x = 10$)</td><td></td><td></td></tr><tr><td>1</td><td>-7</td><td></td><td></td></tr><tr><td>1.1</td><td>-6.238</td><td></td><td></td></tr><tr><td>1.2</td><td>-5.344</td><td></td><td></td></tr><tr><td>1.3</td><td>-4.306</td><td></td><td></td></tr><tr><td>1.4</td><td>-3.112</td><td>1.45</td><td>-2.452...</td></tr><tr><td>1.5</td><td>-1.75</td><td>1.55</td><td>-1.002...</td></tr><tr><td>1.6</td><td>-0.208</td><td>1.65</td><td>0.634...</td></tr><tr><td>1.7</td><td>1.526</td><td>1.75</td><td>2.468...</td></tr><tr><td>1.8</td><td>3.464</td><td></td><td>(1.62 0.123..)</td></tr><tr><td>1.9</td><td>5.618</td><td></td><td>(1.63 0.291..)</td></tr><tr><td>2</td><td>8</td><td></td><td>(1.64 0.461..)</td></tr></table>	x	$2x^3 + x - 10$ (or check $2x^3 + x = 10$)			1	-7			1.1	-6.238			1.2	-5.344			1.3	-4.306			1.4	-3.112	1.45	-2.452...	1.5	-1.75	1.55	-1.002...	1.6	-0.208	1.65	0.634...	1.7	1.526	1.75	2.468...	1.8	3.464		(1.62 0.123..)	1.9	5.618		(1.63 0.291..)	2	8		(1.64 0.461..)
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17. $85\% \equiv 6154$ $\frac{6154 \times 100}{85}$ OR $\frac{6154}{0.85}$ = 7240	B1 M1 A1	Accept any indication. Implies the B1.																																																
18. $x = 54(^{\circ})$ <u>Opposite angles</u> (of a <u>cyclic quad.</u> (add up to 180°). $y = 108(^{\circ})$ <u>Angle at the centre</u> (is twice the angle at the circumference).	B1 E1 B1 E1	Dependent on an attempt at 180 – 126. FT 2 × 'their 54' only if less than 360° Dependent on an attempt at 2 × 'their 54'.																																																