GCSE MARKING SCHEME

AUTUMN 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

AUTUMN 2019 MARK SCHEME

GCSE Mathematics **Unit 2: Intermediate Tier**	**Mark**	**Comments**
1.(a) 0·125 × 1176 or equivalent. = 147 ISW	M1 A1	
1.(b) 190	B2	If further incorrect work shown e.g. '190 = 19' then allow B1 only. B1 for sight of 191 or 192 or 191·7(…….) or 190·0
1.(c) 4·7	B2	If further incorrect work shown e.g. '4·7 = 5' then allow B1 only. B1 for sight of 4·6 or 4·68(…..) or 4·70
2. f = 73(°) g = 128 – 73 = 55(°)	B1 M1 A1	F.T. 128 − 'their f'.
Alternative method f = 73(°) *g = 180 – (180 −128) – 73* *= 55(°)*	*B1* *M1* *A1*	*FT 'their f'.*
3. (1) **5** (9) (7) (8) **2** **9** (4) (1)	B3	B1 for each. No F.T.
4.(a) $\frac{1}{12}$	B1	
4.(b) D	B1	
4.(c) $\frac{1}{3}$	B1	

5. Sight of 6·25 (hrs) OR 375 (min) (Planning =) $\frac{2}{5} \times 6{\cdot}25$ OR $\frac{2}{5} \times 375$ = 2·5 (hrs) OR 150 (min) (Remainder of work = 6·25 − 2·5 OR 375 – 150 =) 3·75 (hrs) OR 225 (min) = 3 hours 45 minutes	B1 M1 A1 B1 B1	 F.T. 'their time' in hours or in minutes. May be seen in parts (1/5th and then 2/5ths) [Note: 2/5 × 6·15 OR 2/5 × 615 is B0M1(FT) = 2·46(hrs) OR 246(min) A1(FT) BUT A0 if 2·46 then used as as 2h 46m] F.T. 'their derived times' using same units. F.T. correct conversion of 'their times', correct to the nearest minute (rounded or truncated), if of equivalent difficulty. Allow unambiguous indication of units.
Alternative method 1 *Sight of 6·25 (hrs) OR 375 (min)* *(Remaining work takes) 3/5 of time* *= 3/5 × 6·25 OR 3/5 × 375* *= 3·75 (hrs) OR 225 (min)* *= 3 hours 45 minutes*	*B1* *B1* *M1* *A1* *B1*	 *F.T. 'their time' in hours or in minutes.* *F.T. correct conversion of 'their times', correct to the nearest minute (rounded or truncated), if of equivalent difficulty.* *Allow unambiguous indication of units.*
Alternative method 2 *(Planning =) $\frac{2}{5} \times 6$ AND $\frac{2}{5} \times 15$* *= 2·4(hrs) AND 6(min)* *= 2hrs 30min* *(Remainder of work =) 6(hr) 15(min) −2(hrs) 30(min)* *= 3 hours 45 minutes*	*M1* *A1* *A1* *M1* *A1*	 *2·4 hrs may be given as 2hrs 24min.* *C.A.O.* *F.T. 'their derived planning time' in hours and min.*
Alternative method 3 *(Remaining work takes) 3/5 of time* *= $\frac{3}{5} \times 6$ AND $\frac{3}{5} \times 15$* *= 3·6(hrs) AND 9(min)* *= 3hrs 36min + 9(min)* *= 3 hours 45 minutes*	*B1* *M1* *A1* *M1* *A1*	 *3·6 hrs may be given as 3hrs 36min.* *F.T. 'their derived times' in hours and min.*
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) Attempt at 323 + 217 AND 122 + 58	B1	Allow for an attempt at adding the correct two pairs of numbers.
= 3 : 1	B2	B1(plus previousB1) for a ratio equivalent to 3 : 1 e.g. 540 : 180. Allow B1B1 for a final answer of 1 : 3. If no marks gained allow SC1 for a final answer of 89 : 55 OR 55 : 89 (Llandudno : Aberystwyth ratio.)
6.(b) $\frac{445}{720}$ ISW $\left(\frac{89}{144}\right)$	B2	0·618(…) or 0·62 or 61·8(..)% or 62% implies B2. B1 for x/720 if x < 720. B1 for 445/y if y>445. Allow B1 for 0·61 or 61%. Penalise -1 for incorrect notation, e.g. 445 out of 720.
7. Both points in correct position.	B4	*Tolerance of ±2° and ± 2mm* Allow 'end of line' to indicate position(s) of point(s) P. B3 for one point in correct position. B2 for one or two point(s) within 'distance' tolerance. B1 for one or two point(s) within 'angle' tolerance. If no marks gained allow SC1 for sight of 8 cm (≡) 400m OR 2cm (≡) 100m OR 1 cm (≡) 50m OR (scale =) 1 : 50
8.(a)(i) (x =) 36	B1	Accept embedded answer unless contradicted by x ≠ 36. Mark final answer.
8.(a)(ii) 12x + 8 = 12 OR 3x + 2 = 3 12x = 4 OR 3x = 1 $x = \frac{4}{12}$ OR $x = \frac{1}{3}$	 B1 B1 B1	F.T. until 2nd error. Adding 'unlike terms' eg 12x + 8 = 20x or 3x + 2 = 5x to be taken as two errors. Mark final answer. Allow 0·33(33..) A final answer of 0·3 is (B1B1)B0.
8(b)(i) 7(2a + 3)	B1	
8(b)(ii) f(f − 1)	B1	
9. a = 123(°) b = 57(°) c = 74(°)	B1 B1 B1	 OR F.T. 180 – a.
10. One correct evaluation $3 \le x \le 4$ 2 correct evaluations $3{\cdot}55 \le x \le 3{\cdot}75$, one < 37, one > 37. 2 correct evaluations $3{\cdot}55 \le x \le 3{\cdot}65$, one < 37, one > 37. $x = 3{\cdot}6$	 B1 B1 M1 A1	*Correct evaluation regarded as enough to identify if <37 or >37. If evaluations not seen accept 'too high' or 'too low'.* *Look out for testing $x^3 - 3x - 37 = 0$* x : $x^3 - 3x$ 3 : 18 3·1 : 20·491 3·2 : 23·168 3·3 : 26·037 3·4 : 29·104 3·5 : 32·375 (3·55 : 34·08....) **3·6 : 35·856** (**3·65 : 37·67..**) **3·7 : 39·553** (3·75 : 41·48...) 3·8 : 43·472 3·9 : 47·619 4 : 52

11.(a) 	Throws	20	40	60	80	100
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Heads	11	18	24	30	**37**
Rel. Fq.	0·55	0·45	**0·4**	0·375	0·37 | B1 B1	
11.(b) (Mid-points are) 4·5, 14·5 and 24·5. (Estimated total =) $3 \times 4{\cdot}5 + 5 \times 14{\cdot}5 + 2 \times 24{\cdot}5$ (= 135) $\div 10$ (Estimated mean =) = 13·5 (Difference = 15·2 – 13·5 =) 1·7	B1 M1 m1 A1 B1	F.T. 'their mid-points' if within group. C.A.O. F.T. for difference between 15·2 and 'their derived estimated mean (≠15·2)'. Allow −1·7.
12.(a) –5	B1	
12.(b) At least 7 correct plots and no incorrect plot. A smooth curve drawn through their plots.	P1 C1	F.T. 'their (1,−5)' Allow ± '½ a small square'. F.T. 'their 8 plots'. OR a curve through the 7 given points and (1,−5) Allow intention to pass through their plots. (± 1 small square horizontal or vertical.)
12.(c)(i) Line y + x = 4 drawn.	B2	B1 for a straight line going through(0,4) or (4,0) BUT NOT line y = 4 nor line x = 4
12(c)(ii) −2·4 AND 3·4	B1	F.T. intersection of 'their curve' with 'their y + x = 4 ' (even for line y = 4) only if exactly two points of intersection. Must be seen to intersect their curve at two points. Allow ± '1 small square'.
13. Sight of 1·25 or 125(%) $\frac{n}{1{\cdot}25n}$ (×100) = 80(%)	B1 M1 A1	Accept sight of n and 1·25n where n may be any numerical value e.g. '18 and 22·5'. $\frac{1}{1{\cdot}25}$ (n =1) OR 0·8 implies B1M1. An answer of 80(%) gains B1M1A1.
14. MN = 13·5 × cos 27 = 12(·0…) (cm) ISW	M2 A1	M1 for cos 27 = $\frac{MN}{13{\cdot}5}$ *A correct and complete method (e.g. using two trigonometric relationships.) M2* *MN = 12(·0..)(cm) ISW A1*
15. Method to eliminate variable e.g. equal coefficients with intention to appropriately add or subtract' First variable found x = 4 or y = −3. Substitute to find the 2nd variable. Second variable found.	 M1 A1 m1 A1	*No marks for 'trial and improvement'.* *No marks for an unsupported answer.* Allow 1 error in one term, not one with equal coefficients. C.A.O. F.T. their '1st variable'.

16.(a) $20 \times 15 - \pi \times 4^2$	M1	
$\times 10$	m1	
2497(·….) OR $3000 - 160\pi$	A1	Accept an answer between 2497 and 2498 inclusive OR 2500. SC1 for sight of $\pi \times 4^2 \times 10$ OR 160π (accept 502 to 503 inclusive).
16.(b)		
(Mass =) 2497·(..) × 2·4 OR 2497·(..) × 0·0024	M1	F.T. 'their volume in (a)'
= 5993·6(..)(g) OR 5·9936..(kg)	A1	Accept value truncated or rounded to a whole number. Ignore units.
6(kg)	A1	F.T. from 'their 5993·6..g' or 'their 5·9936..kg' ONLY if M1 awarded AND 'their 5993·6..g' > 500g or 'their 5·9936..kg' > 0.5kg If no marks awarded, allow SC1 for (Mass =) 'their volume' × density, where density may have incorrect place value e.g. '2497·(..) × 0·024'
17. 8	B1	
18. $\frac{24 \times AC}{2}$ = 84 or equivalent.	M1	
AC = 7 (cm)	A1	
$(BC^2 =) \ 7^2 + 24^2$	M1	F.T. 'their AC'.
$BC^2 = 625$ or $(BC =) \ \sqrt{625}$	A1	Final answer of BC = 625 is M1A0A0.
(BC =) 25(cm)	A1	F.T. √'their 625' provided M1 gained.
(Perimeter = 24 + 7 + 25 =) 56(cm)	B1	F.T. 24 + 'their AC' + 'their BC' provided at least one M1 mark gained AND 'their BC' > 24. *Alternative method to find BC* *A correct and complete method (e.g.using two trigonometric relationships.)* *M2* *BC = 25(cm)* *A1*