GCSE MARKING SCHEME

SUMMER 2019

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

INTRODUCTION

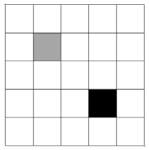
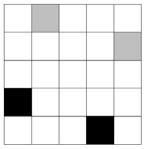
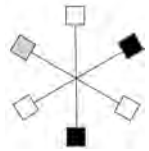
This marking scheme was used by WJEC for the 2019 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' 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.

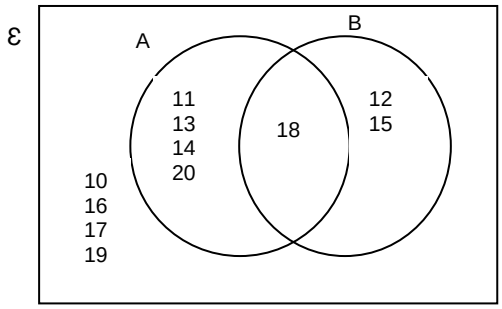
It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

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

WJEC GCSE MATHEMATICS

SUMMER 2019 MARK SCHEME

<table>
<tr><th>GCSE Mathematics
Unit 1: Intermediate Tier</th><th>Mark</th><th>Comments</th></tr>
<tr><td>1.
<table>
<tr><td>23 – (4 + 2) × 3 = 5</td><td>TRUE</td><td></td></tr>
<tr><td>7/10 + 2/5 = 9/15</td><td></td><td>FALSE</td></tr>
<tr><td>½ of 1/8 = 1/4</td><td></td><td>FALSE</td></tr>
<tr><td>25% of 0·4 = 0·1</td><td>TRUE</td><td></td></tr>
<tr><td>28 – 3 × 2 + 5 = 55</td><td></td><td>FALSE</td></tr>
</table></td><td>B3</td><td>For all 5 correct
B2 for 4 correct.
B1 for 3 correct</td></tr>
<tr><td>2.(a)
<table>
<tr><td rowspan="2">Type</td><td colspan="2">Yellow</td><td colspan="2">Blue</td></tr>
<tr><td><100</td><td>≥100</td><td><100</td><td>≥100</td></tr>
<tr><td>Num.</td><td>(8)</td><td>7</td><td>4</td><td>6</td></tr>
</table></td><td>B2</td><td>For all three correct.
B1 for 1 or 2 correct.
If no marks awarded allow B1 for all correct tallies seen.</td></tr>
<tr><td>2.(b) Any valid statement that indicates that the numbers (in the table) are added (to make 25).
e.g. ‘add the frequency’</td><td>E1</td><td>Allow ‘add them up’.
Allow sight of ‘8 + 7 + 4 + 6 (= 25).’</td></tr>
<tr><td>2.(c) $\frac{8}{25}$ or equivalent ISW</td><td>B2</td><td>B1 for x/25 with x<25.
B1 for 8/y with y >8.
Penalise incorrect notation −1.
e.g. ‘8 out of 25’, ‘8 : 25’, ‘8 in 25’.</td></tr>
<tr><td>3.(a)
  </td><td>B1</td><td></td></tr>
<tr><td>3.(b)
  </td><td>B1</td><td></td></tr>
<tr><td>3.(c)
  </td><td>B1</td><td></td></tr>
<tr><td>4.(a) −3
1</td><td>B1
B1</td><td>
OR FT ‘their −3’ + 4.</td></tr>
<tr><td>4.(b)(i) 21</td><td>B1</td><td></td></tr>
<tr><td>4.(b)(ii) 191</td><td>B1</td><td></td></tr>
<tr><td>4.(c) Divide (the previous number) by 3.</td><td>E1</td><td>Allow ‘÷3’.
Do not accept n÷3.</td></tr>
</table>

5.(a) Any correct total of **2**. e.g. 3 + 3 + 3 − 7	B1	B0 if any numbers other than 3 and 7 used. B0 if any operation other than + or – used. e.g. 3 × 3 is not acceptable for 3 + 3 + 3. Allow multi-digit numbers made from 3 or/and 7. e.g. 33, 37, 373 etc.
5.(b) Any correct total of **8**. e.g. 7 − 3 + 7 − 3	B1	B0 if any numbers other than 3 and 7 used. B0 if any operation other than + or – used. e.g. 2 × 7 is not acceptable for 7 + 7. Allow multi-digit numbers made from 3 or/and 7. e.g. 33, 37, 373 etc.
5.(c) Any correct total of **19**. e.g. 3 + 3 +3 + 3 +7	B1	B0 if any numbers other than 3 and 7 used. B0 if any operation other than + or – used. e.g. 4 × 3 is not acceptable for 3 + 3 + 3 + 3. Allow multi-digit numbers made from 3 or/and 7. e.g. 33, 37, 373 etc.
6.  	 B1 B1 B2	*Allow intent of drawing circles and a rectangle.* Two <u>intersecting circles</u> AND <u>labelled A and B</u> AND within a <u>rectangle</u>. Allow missing 'Ɛ' symbol. For unambiguous indication that the set B consists of 12, 15 and 18 only. B0 if any of these numbers are repeated outside B. All eleven numbers in correct position (with or without a rectangle), with no other or repeated numbers. B1 for six to ten numbers in correct position. Repeated numbers should not be credited. Other numbers may be ignored for this B1 mark.
7.(a) 5(2a - 3)	B1	Mark final answer.
7.(b)(i) (x =) 147	B1	Accept embedded answer. Mark final answer.
7.(b)(ii) 13f – 6f = 5 − 2 7f = 3 (f =) 3/7	 B1 B1 B1	F.T. until 2nd error. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction. Mark final answer. Allow 0·43 or 0·429 or 0·428… as a final answer.
7.(c) '5n – 3 can be even or odd' ticked or implied AND a valid explanation given. e.g. '5×3 – 3 = 12 (even) and 5×4 – 3 = 17 (odd)' 'if n is odd you get even (but) if n is even you get odd'	E1	A valid explanation implies '5n – 3 can be even or odd', unless contradicted. Allow e.g. '15 – 3 =12, 20 – 3 = 17'. Allow a correct sequence shown e.g. 2, 7, 12, …. Do <u>not</u> accept 'n can be anything', 'n can be odd or even'. Do <u>not</u> accept an explanation that only uses 5n. e.g. '5 × 2 = 10 (even), 5 × 3 = 15 (odd)'

8. (Area of the triangle CDE =) $14 = \frac{4 \times CE}{2}$ (CE =) 7 (cm) (Area ABCE = 7 × 7 =) 49 (cm^2) (Area of whole shape = 49 + 14 =) 63 (cm^2)	 M1 A1 B1 B1	*Lengths may be shown on the diagram.* Accept equivalent e.g. 28 = 4 × CE. FT 'their stated or shown length CE'. FT 'their stated or shown area of square' + 14.
8. *Alternative method* *(Area of the triangle CDE =) $14 = \frac{4 \times CE}{2}$* *(CE =) 7 (cm)* *(Area Trapezium ABCD =) $\frac{[(7 + 4) + 7] \times 7}{2}$* *= 63 ($cm^2$)*	 *M1* *A1* *M1* *A1*	*Lengths may be shown on the diagram.* *FT 'their stated or shown length CE (=CB)' consistently as 'their 7'.*
8.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
9. (a =) $\frac{180 - 110}{2}$ or equivalent. = 35(°) b (= 180 – 90 – 35) = 55(°) c (= 90 + 55) 145(°) OR c (= 180 − 35) 145(°)	M1 A1 B1 B1	 OR FT 90 − 'their a'. OR FT 90 + 'their b'. OR FT 180 − 'their a'

10.(a) For a method that produces 2 prime factors from the set {3, 3, 5, 7} before the 2nd error.	M1	
3, 3, 5, 7	A1	C.A.O. For sight of the four correct factors (Ignore 1s)
$3^2 \times 5 \times 7$	B1	F.T. 'their primes' provided at least one index form used with at least a square. Allow $(3^2)(5)(7)$ and $3^2.5.7$ Inclusion of 1 as a factor gets B0.
10.(b) $42 = 2 \times 3 \times 7$ or equivalent correct strategy.	M1	M1 for sight of 2, 3, 7 'together'. (Not for 2x21, 3x14 and 6x7.) (Not for <u>just</u> listing all factors 1,2,3,6,7,14,21.)
(HCF =) 21	A1	M1A0 for 3×7. FT 'their answer to 10(a)' only if of equivalent difficulty (at least two common prime factors).
11. −13	B1	
Scale on y-axis '2cm square ≡ 10 units'.	B1	
At least 7 correct plots and <u>no incorrect</u> plots.	P1	F.T. 'their (−2,−13)' AND 'their uniform scale' if possible. Allow ± '½ a small square'.
A smooth <u>curve</u> drawn through their plots.	C1	F.T. 'their 8 plots'. (Only if an uniform scale used.) OR a curve through the 7 given plots and (-2,-13). Allow intention to pass through their plots (within 1 small square, either horizontally **<u>or</u>** vertically of the point).
12.		*Answers/working may be seen on diagram.*
(Angle AÔB or exterior angle =) $\frac{360(°)}{8}$	M1	
$= 45(°)$	A1	Sight of 45 (even e.g. OÂB = 45) gains M1A1.
(OÂB =) $\frac{180 - 45}{2}$	M1	FT 'their 45' (but not 60°).
$= 67{\cdot}5(°)$	A1	
12. <u>Alternative method 1</u>		
(Sum of interior angles =) (8 – 2)×180° or equivalent	*M1*	
= 1080(°)	*A1*	*(Interior angle =) 135(°) implies M1A1*
(OÂB =) ½ × (1080 ÷ 8) or equivalent	*M1*	*FT 'their interior angle sum' (≠ 1440)*
= 67·5(°)	*A1*	
12. <u>Alternative method 2</u>		
(Using 16 right-angled triangles.)		
(Angle at O =) 360 / 16	*M1*	
= 22·5(°)	*A1*	
(OÂB =) 180 – 90 − 22·5	*M1*	*FT 'their 22·5'.*
= 67·5(°)	*A1*	

13. Correct construction <u>method</u> for perpendicular bisector with line drawn. Correct construction <u>method</u> for 60° at point A. Correct construction <u>method</u> for bisecting an angle with line drawn. Point P clearly identified	 B1 B1 B1 B1	*Correct construction arcs must be seen for the first three B1 marks.* <u>Two</u> pairs of Intersecting arcs (centres at A and B) Allow if drawn at point B. Allow B1 for correct method (tolerance will be penalised with final B0). FT 'their angle of 60°' drawn at point A or point B. C.A.O. within tolerance. Intersecting lines alone with no indication that this is point P is <u>not sufficient</u> for this B1. Do not penalise if both possible positions shown. Final B1 may be awarded after B0B0B0.
<u>13. Alternative method</u> *Correct construction method for 60° at point A (or B).* *Correct construction method for bisecting the angle at A (or B) with line drawn.* *Repeating the above two stages at B (or A)* *Point P clearly identified*	 *B1* *B1* *B1* *B1*	*Correct construction arcs must be seen for the first three B1 marks* *Allow B1 for correct method (tolerance will be penalised with final B0).* *C.A.O. within tolerance.* *Intersecting lines alone with no indication that this is point P is <u>not sufficient</u> for this B1.* *Do not penalise if both possible positions shown.* *Final B1 may be awarded after B0B0B0.*
14. Sight of any TWO of 30, 2 or 0·5 OR Sight of any TWO of 30, 8 or 0·5 as appropriate approximations. $\frac{30 \times 8}{0{\cdot}5}$ or equivalent. = 480	B1 M1 A1	Allow 30·2 for 30. Equivalent e.g. $\frac{30 \times 2 \times 2 \times 2}{\frac{1}{2}}$ or $\frac{30 \times 2^3}{0{\cdot}5}$ Must be seen, but allow if attempted calculation done in steps. M0 for exact calculation. C.A.O. Allow 483·2 if 30·2 used.

15.(a) 0·32	B1	
15.(b) Sample number from Anglesey on 2nd day = 3000 × 0·42 = 1260 (Rel.Fqu. for two days =) $\frac{640 + 1260}{2000 + 3000}$ = 0·38	 M1 A1 M1 A1	 Allow M1A1 for sight of 1260 e.g. 1260/3000 FT 'their 1260'.
15.(c) 'Answer to part (b)' noted AND Valid explanation e.g. 'more people sampled'	 E1	 Explanation must refer to the sample being the largest. Allow e.g 'from both days', 'number of people added', 'frequencies are added'. Do not accept 'relative frequencies are added'.
16.(a)(i) 425 kg	B1	
16.(a)(ii) 21·5 s	B1	
16.(a)(iii) 83 people	B1	
16(b) $2{\cdot}38 \times 10^{-2}$	B2	B1 for sight of a correct answer but not in standard form. e.g. $23{\cdot}8 \times 10^{-3}$ or 0·0238.
17.(a) $5n < 3n + 7$ or equivalent ISW	B2	$2n < 7$ OR $n < 7/2$ implies B2. Ignore use of a different letter e.g. $5x < 3x + 7$. Use of '≤' is B1. B1 for sight of $3n + 7$ in an inequality.
17.(b) $2n < 7$ OR $n < 7/2$ (Greatest amount =) (£)3	B1 B1	FT 'their inequality' if of equivalent difficulty. May be seen in part (a). FT 'their $n < k$'. B0 if they have 'n>k'. B0 if it leads to n<1 An answer of (£)3 gains B1B1 (unless from incorrect algebra work).
18.(a) 0·7 shown for 'Does not go on tour bus'. Use of 0·3 × …… = 0·24 P(sees show) = 0·8 Second set of branches 0·8, 0·2, 0·8, 0·2	B1 M1 A1 A1	 Allow M1A1 if 0·8 seen on one of the 'sees show' branches. FT 'their 0·8' **only** if M1 awarded. (0·24, 0·76, 0·24, 0·76 is M0A0A0)
18.(b) 0·7 × 0·2 = 0·14 ISW	M1 A1	FT 'their values' if both between 0 and 1.