GCSE MARKING SCHEME

SUMMER 2018

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

This marking scheme was used by WJEC for the 2018 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.
<table>
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<tr>
<th>GCSE Mathematics</th>
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<td>Unit 1: Intermediate Tier</td>
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<td>Summer 2018 Final Marking Scheme</td>
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<tr>
<td>Mark</td>
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<tr>
<td>1.(b) 12</td>
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<tr>
<td>1.(c) 17</td>
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<tr>
<td>2.(a) 10 miles</td>
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<tr>
<td>2.(b) 1 kg</td>
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<tr>
<td>2.(c) 7 pints</td>
</tr>
<tr>
<td>3.(a) −5 −1 1</td>
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<tr>
<td>3.(b) Correct plots.</td>
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<tr>
<td>3.(c) (−4,−7) (6,−7) (6,3) (−4,3) (In any order)</td>
</tr>
<tr>
<td>4.(a) Statement indicating that 0·3 is less than 0·5. OR Statement indicating that probability of selecting a blue ball should be greater than 0·5. OR Statement that refers to a proportion of the balls e.g. 'Only 30% (of the balls) are blue', 'Only 3/10(ths) (of the balls) are blue'.</td>
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<tr>
<td>4.(b) 0·7 or equivalent.</td>
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<td>4.(c) 0·3 × 50</td>
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<tr>
<td>5.(a) Correct cuboid</td>
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<tr>
<td>5.(b) (Volume =) 6 × 4 × 3 = 72 cm³.</td>
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</table>

Any further manipulation to 6 × 4 × 3 is M0. Independent of other marks.
6.(a) \[ t_7 = t_6 + 3 \] \[ \text{B1} \]

6.(b) (i) \[ 9 \] \[ \text{B1} \] Mark final answer.

6.(b) (ii) \[ -5 \] \[ \text{B1} \] Mark final answer.

7. 50 \[ \text{B3} \] Award B1 for each of the 2nd, 3rd and 4th condition
1-20 gain B1 apart from,
B0 for 4,12,16,20.
B2 for 2,18.
21-79 gain B2 apart from,
B1 for 24,28,36,40,44,48,52,56,60,64,68,76.
B3 for 50.
80-100 gain B1 apart from,
B0 for 80,84,88,92,96,100.
B2 for 98.
Otherwise
B0 if number greater than 100.
B0 if not a whole number.

8. \( \text{EC} = \text{Side of the square} = \) \[ \frac{28}{4} \]
\[ = 7 \text{(cm)} \] \[ \text{M1} \]
\( \text{Area of triangle CDE} = \) \[ \frac{7 \times \text{DE}}{2} \]
\[ = 35 \text{(cm}^2) \] \[ \text{M1} \]
\( \text{DE} = 10 \text{(cm)} \) \[ \text{A1} \]

Organisation and Communication.

Accuracy of writing.

9.(a) Correct reflection in \( y = 1 \). \[ \text{B2} \] B1 for correct reflection in \( x = 1 \) OR
B1 for sight of line \( y = 1 \)

9.(b) Clockwise rotation of \( 90^\circ \) about the origin. \[ \text{B3} \] For all four components.
Accept anticlockwise rotation of \( 270^\circ \) about the origin. B2 for any three. B1 for any two.
‘Origin’ may be stated as e.g. \((0,0)\) or 0 or O.
Do not accept ‘turn’ for rotation.
Allow for ‘about the origin’ any reference to the origin.
e.g. ‘in the origin’, ‘around the origin’, ‘from \((0,0)\)’ etc.
If not a single transformation (e.g. ‘clockwise rotation of 90 and then …..) penalise −1 mark from any marks gained. (Above example gains B2 −1 = 1 mark.)

10.(a) \[ 12 \] \[ \text{B1} \]

10.(b) \[ \times 1.04' \] \[ \text{B1} \]

10.(c) \[ 3^{1/5} \] \[ \text{B1} \]
11.(a) 

12 AND 5 in correct position. Total of 18 for 'Bread of Heaven' Overall total of 30. 

Any ‘blank space’ to be taken as 0. If ‘notches/tallies’ are used, penalise −1 once.

11.(b) 

19 or equivalent. ISW B2 

B1 for a numerator of 19 OR FT ‘their total for HWN’ in a fraction < 1. 

B1 for a denominator of 30 OR FT ‘their total’ in a fraction < 1. 

An answer of 19/30 gains B2 regardless of ‘their Venn diagram’. 

Penalise incorrect notation (e.g. ‘19 in 30’) −1.

12.(a) 

5x² – 2x – 3x² + 6x – 21 = 2x² + 4x – 21 B2 

B1 for sight of 5x² – 2x. 

B1 for sight of – 3x² + 6x – 21. Brackets must be removed. 

Allow both of the above B marks even if not part of a single expression. 

FT for B2 if at least two x² terms AND at least two x terms to be simplified. 

FT for B1 if at least two x² terms OR at least two x terms to be simplified. 

If B2 not awarded, allow B1 for correct collection of ‘x² terms’ (2x²) OR B1 for correct collection of ‘x terms’ (+4x). 

This 2nd B2 (or B1) is for their final answer. 

Any compensating errors leading to a ‘correct’ answer is B0. 

Penalise −1 for any attempt to equate their expression to zero (and attempting to solve) OR Incorrectly factorising.

12.(b) 

22 – f = 3 × 6 or equivalent. 22 – 18 = f OR –f = 18 – 22 f = 4 M1 A1 A1 

C.A.O. 

Accept 4 = f. M1A1A0 for –f = −4. 

Mark final answer. 

Allow all 3 marks for 22 – 4 = 6 with no further work. 

3 

Allow 2 marks for 22 – 4 = 6 followed by ‘f ≠ 4. 

3 

If no marks gained. 

Allow SC1 for an unsupported f = −4. 

Allow SC1 for sight of 18 from 3 × 6.

13.(a) 

1/6 × 1/6 = 1/36 M1 A1 

13(b)(i) 

P(Caernarfon) = ¼ or equivalent P(Newtown) AND P(Ebbw Vale) = 1/8 or equivalent P(Caernarfon) = ¼ or equivalent P(Newtown) AND P(Ebbw Vale) = 1/8 or equivalent 

Penalise incorrect notation −1 once only in 13(b) C.A.O. 

C.A.O. 

Do not allow 0-5/4 for 1/8. 

13(b)(ii) 

½ + 1/8 = 5/8 or equivalent. M1 A1 

FT ½ + ‘their P(Eb.V.)’. Provided P(Eb.V)<1 for M1. 

FT answer must be < 1 for A1. 

Allow 2-5/4 for 5/8 if answer to 13(b)(i) is 0-5/4.
<table>
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<tr>
<th>Question</th>
<th>Expression</th>
<th>Marks</th>
<th>Notes</th>
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<tr>
<td>14.(a)</td>
<td>$1.56 \times 10^6$</td>
<td>B2</td>
<td>Mark final answer. B1 for sight of $15.6 \times 10^5$ OR $1560000$ OR equivalent correct value but not in standard form.</td>
</tr>
<tr>
<td>14.(b)</td>
<td>$1.3 \times 10^5$</td>
<td>B2</td>
<td>Mark final answer. B1 for sight of $13 \times 10^4$ OR $130000$ OR equivalent correct value but not in standard form.</td>
</tr>
<tr>
<td>15.</td>
<td>$3x(4x + y)$</td>
<td>B2</td>
<td>Accept $3x(4x + 1y)$ B1 for $3x(4x \pm \ldots)$ or $3x(\ldots+y)$ B1 for $3(4x^2 + xy)$ or $x(12x + 3y)$.</td>
</tr>
<tr>
<td>16.</td>
<td>$(ADC =) \ 109(\degree)$ $x = 180 - 26 - 109$ $= 45(\degree)$</td>
<td>B1</td>
<td>Answers may be written on the diagram. Allow for sight of $109(\degree)$. FT 'their $109\degree$' (may be clearly indicated on the diagram) provided $\neq 71$ and $\neq 26$. An answer of $45(\degree)$ gains all 3 marks.</td>
</tr>
<tr>
<td>17.</td>
<td>Correct construction of perpendicular bisector of line AB.</td>
<td>B2</td>
<td>B1 for a perpendicular bisector with no arcs or only one pair of intersecting arcs (above or below) shown. B1 for two pairs of correct arcs, with no line or an incorrect line. Allow $\pm 2\degree$ and $\pm 2$ mm. B1 for a perpendicular bisector with no arcs or only one pair of intersecting arcs (above or below) shown. B1 for two pairs of correct arcs, with no line or an incorrect line.</td>
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<tr>
<td>18.</td>
<td>$\angle BXC = 80(\degree)$ Reason: ‘$BX = BC$’ OR ‘Isosceles triangle’ $\angle AXB = 180 - 80 = 100(\degree)$ Reason: ‘Angles on a straight line’. $\angle ABX = 180 - 40 - 100 = 40(\degree)$ Reason: ‘Angles in a triangle’. Statement ‘So AX = BX’, Reason: ‘Two equal angles (in a triangle)’ OR $\angle ABX = \angle BAX$ OR ‘Isosceles triangle’. Sight of at least TWO of the above reasons.</td>
<td>B1</td>
<td>Angles shown on the diagram take precedence. If any angle is not named then it must be unambiguously identified either on the diagram, from a given reason or in further work. (e.g. must be convincing that $X = 80$ is referring to $BXC$ and not $AXB$.) If initial incorrect assumptions are made then allow correct FT methods to calculate other relevant angles. B1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B1</td>
<td>FT $180 - 40 - \text{their } \angle AXB$.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B1</td>
<td>Only available if $\angle ABX$ stated or shown to be $40(\degree)$</td>
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<td></td>
<td></td>
<td>E1</td>
<td>Reasons must be appropriate AND are dependent on associated B1 gained.</td>
</tr>
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**Alternative method 1.**

\[ \angle BXC = 80^\circ \]
Reason: ‘\(BX = BC\)’ OR ‘Isosceles triangle’.

\[ \angle CBX (= 180 - 80 - 80) = 20^\circ \]
Reason: ‘Angles in a triangle’.

\[ \angle ABX (= 180 - 80 - 40 - 20) = 40^\circ \]
Reason: ‘Angles in a triangle’.

Statement ‘So \(AX = BX\)’.
Reason: ‘Two equal angles (in a triangle)’ OR ‘\(\angle ABX = \angle BAX\)’ OR ‘Isosceles triangle’.

Sight of at least TWO of the above reasons.

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**Alternative method 2. (Assumption that \(AX = BX\)).**

\[ \angle ABX = 40^\circ \]
Reason: ‘\(AX = BX\)’ OR ‘Isosceles triangle’.

\[ \angle AXB (= 180 - 40 - 40) = 100^\circ \]
Reason: ‘Angles in a triangle’.

\[ \angle BXC = 80^\circ \]
Reason: ‘Angles on a straight line’.

Statement ‘So \(BX = BC\)’ (as given)
Reason: ‘Two equal angles (in a triangle)’ OR ‘\(\angle BXC = \angle BCX\)’ OR ‘Isosceles triangle’.

Sight of at least TWO of the above reasons.

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**Alternative method 3. (Assumption that \(AX = BX\)).**

\[ \angle ABX = 40^\circ \]
Reason: ‘\(AX = BX\)’ OR ‘Isosceles triangle’.

\[ \angle CBX (= 180 - 80 - 40 - 40) = 20^\circ \]
Reason: ‘Angles in a triangle’.

\[ \angle BXC (= 180 - 80 - 20) = 80^\circ \]
Reason: ‘Angles in a triangle’.

Statement ‘So \(BX = BC\)’ (as given)
Reason: ‘Two equal angles (in a triangle)’ OR ‘\(\angle BXC = \angle BCX\)’ OR ‘Isosceles triangle’.

Sight of at least TWO of the above reasons.