



GCSE MARKING SCHEME

AUTUMN 2016

**MATHEMATICS (NEW)
UNIT 1 - INTERMEDIATE TIER**

3300U30-1

INTRODUCTION

This marking scheme was used by WJEC for the 2016 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.

GCSE MATHEMATICS Unit 1 : Intermediate Tier Autumn 2016		✓	Mark	Comment
1.(a)	0.28 or equivalent e.g. 28/100		B1	Allow .28.
1.(b)	6.35		B1	
1.(c)	(27 – 16 =) 11		B2	B1 for sight of 27 OR 16.
1.(d)	<u>Correctly</u> using a common denominator 3/10 OR 15/50 OR 0.3 or equivalent.		M1 A1	M1 for 9/10 – 6/10 OR 45/50 – 30/50 OR 0.9 – 0.6 OR equivalent Mark final answer.
2.	TRUE TRUE FALSE FALSE TRUE		B3	B3 for 4 or 5 correct. B2 for 3 correct. B1 for 2 correct.
3.	Blue 16 Yellow 11 Red 4		B3	<i>Note Check for the required conditions being met and not the individual numbers. Required conditions are: 'B = Y + 5', 'B = 4R' and 'B + Y + R = 31'. A condition must be met using non-negative integers, otherwise B0. B3 all three conditions correct. B2 for two conditions correct. B1 for one condition correct. Answer space answers take precedence. If answer spaces are left blank allow <u>unambiguous</u> indication of their answers. A number must be given for 'Blue', else B0. Blank spaces for 'Yellow' and 'Red' to be taken as 0 unless <u>unambiguously</u> indicated elsewhere.</i>
4.(a)	5 -2		B2	B1 for 5. B1 F.T. for 'their 5' – 7 if negative.
4.(b)	7g – 2f		B2	Must be an expression for B2. B1 for sight of (+)7g OR – 2f. B1 for 7g + – 2f. Mark final answer.
4.(c)	For sight of $22 = 4 + 3K$ OR $18 = 3K$ OR $\frac{22-4}{3} (=K)$ (K=) 6		B1 B1	'2 × 11' must be shown to be 22 and used at some stage. An answer of 6 gains both B1 marks. Allow an embedded answer e.g. $2 \times 11 = 4 + 3 \times 6$ gains B2. BUT $22 = 4 + 18$ alone is B0. B1B0 for 18/3 as a final answer.
Ribbon marking for 5(a), 5(b) and 5(c).				
5.(a)	(9) 10 (11) 12 13 (6) 7 (8) 9 10 (3) (4) (5) (6) (7) (1) (2) (3) (4)		B1	All six entries correct.
Ribbon marking for 5(a), 5(b) and 5(c).				
5.(b)	$\frac{5}{12}$		B2	F.T. 'their fully completed table'. Penalise –1 for <u>only</u> words (5 out of 12) or <u>only</u> ratio (5:12). B1 for x/12 if x < 12. B1 for 5/y if y > 5.
Ribbon marking for 5(a), 5(b) and 5(c).				
5.(c)	$\frac{5}{12} \times 60$ = 25		M1 A1	F.T. 'their 5/12' (including e.g. ½, 50%, 50-50, evens) 25/60 OR 25:60 gets M1A0. 25 out of 60 gets M1A1.

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<p>6 (BD or AE) × 9 = 45 OR (BD or AE =) 45/9</p> <p>(BD or AE =) 5(cm)</p> <p>(CD =) 6(cm)</p> <p>(Area of triangle =) $\frac{5 \times 6}{2}$ = 15(cm²)</p> <p>Organisation and Communication.</p> <p>Accuracy of writing.</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>M1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p> <p>OC1</p> <p>W1</p>	<p>Accept any unambiguous reference to or notation for BD and AE. Allow use of 'height' or 'width'. May be seen on the diagram.</p> <p>May be seen on the diagram.</p> <p>F.T. 'their 5' provided it clearly represents BD. F.T. 'their 6' provided it clearly represents CD. No marks for an unsupported 15 BUT 15cm² gains all 5 marks.</p> <p><i>Alternative method.</i> $9 \times (BD \text{ or } AE) = 45$ OR (BD or AE =) 45/9 M1 (BD or AE) = 5(cm) A1 (Area of trapezium =) $\frac{9 + 15}{2} \times 5$ M1 (F.T. 'their 5') = 60(cm²) A1 (Area of triangle = 60 – 45 =) 15(cm²) A1</p> <p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> 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 <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> 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.
7.(a) (w =) 50		B1	Accept embedded answer. Mark final answer.
7.(b) (x =) 6		B1	Accept embedded answer. Mark final answer. (x =) 42/7 is B0.
7.(c)		B1 B1 B1	<p>To gain the first two B1 marks there must be an equation.</p> <p>Accept embedded answer. F.T. until 2nd error.</p> <p>32/4 not accepted as final answer.</p> <p>If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction.</p> <p>Mark final answer.</p>

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<p>8</p> <table border="1" data-bbox="207 344 695 618"> <thead> <tr> <th>Sum</th> <th>Answer</th> </tr> </thead> <tbody> <tr> <td>even + even</td> <td>(even)</td> </tr> <tr> <td>even + odd</td> <td>odd</td> </tr> <tr> <td>odd + odd</td> <td>even</td> </tr> <tr> <td>even x even</td> <td>even</td> </tr> <tr> <td>even x odd</td> <td>even</td> </tr> <tr> <td>odd x odd</td> <td>odd</td> </tr> </tbody> </table>	Sum	Answer	even + even	(even)	even + odd	odd	odd + odd	even	even x even	even	even x odd	even	odd x odd	odd		B3	For all 5 correct. B2 for 4 correct. B1 for 3 correct. B0 for fewer than three correct.
Sum	Answer																
even + even	(even)																
even + odd	odd																
odd + odd	even																
even x even	even																
even x odd	even																
odd x odd	odd																
<p>9. All four conditions met.</p> <ul style="list-style-type: none"> All numbers between 1 and 9 inclusive. Median value = 6 Range = 7 Total = 25 		B3	B2 for three conditions met. B1 for two conditions met. Possible answers for B3 are 1, 2, 6, 8, 8. OR 1, 3, 6, 7, 8. OR 1, 4, 6, 6, 8. OR 2, 2, 6, 6, 9. Must have five numbers, otherwise B0. Numbers need not be integers. Numbers shown in the boxes take precedence. If answer boxes are left blank allow <u>unambiguous</u> indication of their <u>five</u> numbers.														
<p>10. (a) $\frac{360}{45}$ $= 8$ (sides)</p>		M1 A1	For a clear intention of finding how many 45s in 360. Accept embedded answers e.g. $360/8 = 45$ or $45 \times 8 = 360$ for M1A1.														
<p>10.(b)</p> <p>Correct construction of 90°.</p> <p>Correct bisector of 90°.</p> <p>AB = 7cm AND BC = 7cm</p>		B2 B1 B1	Do not penalise if they use their own point A. Use overlay but arcs required for the 3 'angle marks'. B2 With sight of accurate 'method arcs'. For this B2 the construction need not be at point B. (Final B1 will not then be awarded) B1 for sight of 'method arcs' but perpendicular line not drawn (Unless intersection of construction arcs for 90° are correctly used to construct the 45° angle. In this case the B2 and B1 are gained) B1 With sight of accurate 'method arcs'. F.T. 'their 90° '. B1 Allow ± 0.2 cm. Do not penalise if the line AB is extended as long as the position of point B is unambiguous. (Allow labelling of points B and C to be missing if end points are unambiguously identifiable.) <i>If all marks gained but angle ABC = 45°, penalise -1.</i>														

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Ribbon marking for 11(a), 11(b) and 11(c). 11 (a) 6 -3		B2	B1 for each.
Ribbon marking for 11(a), 11(b) and 11(c). 11.(b) 7 correct plots. Curve drawn.		P1 C1	<u>Use overlay.</u> F.T. 'their (-1,6)' and 'their (2,-3)'. Allow \pm '½ a small square'. 'F.T. 'their plots'. At least 6 plots required Clear intention to draw a curve through 'their plotted points'.
Ribbon marking for 11(a), 11(b) and 11(c). 11.(c) -0.9 and 3.4		B2	B1 for each. Allow (-0.9,5) and (3.4,5). F.T. intersection of 'their curve' with $y = 5$ provided exactly 2 intersections seen on graph. Allow \pm '½ a small square'. <u>If no marks gained</u> then SC1 for either of the following. $y = 5$ drawn correctly, OR <u>Two</u> correct F.T. values given for 'their straight line' and 'their curve' provided exactly 2 intersections seen on graph.
11.(d) $2x^2 - 5x - 6 = 0$		B1	
Ribbon marking for 12(a) and 12(b). 12.(a) 12		B1	
Ribbon marking for 12(a) and 12(b). 12.(b) $\frac{1}{12}$		B1	F.T. 1/'their (a)'
12.(c) $\frac{1}{6}$		B1	
13. (a) $6m = y - 7$ or $y - 7 = 6m$ or $-6m = 7 - y$ $m = \frac{y-7}{6}$ or $m = \frac{7-y}{-6}$ or $m = (y-7) \div 6$		B1 B1	F.T. only from $6m = y + 7$. B1B0 for $-m = \frac{7-y}{6}$ or equivalent. <u>Note</u> Unsupported $m = y - 7 \div 6$ is B0B0. Unsupported $\frac{y-7}{6}$ is B1BO ('m' missing)
13.(b) $6x(x-2)$		B2	B1 for any partial correct factorisation. OR B1 for $6x(x - \dots)$ OR B1 for $6x(\dots - 2)$
14.(a) 1.5×10^3		B2	If B2 not awarded, B1 for sight of 1500. OR B1 for 1.5×10^n from a denominator of 5×10^3 seen. OR B1 for $a \times 10^3$ with $1 \leq a < 10$ from a denominator of 5×10^3 seen.
14.(b) 6.63×10^4		B2	B1 for $6.6(\dots) \times 10^4$ if B2 not awarded. B1 for any correct answer but not in standard form.

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15. (Perimeter of square =) $4 \times (2x + 3y) = 62$ (Perimeter of octagon =) $8 \times (x + 2y) = 72$ Correct method to solve simultaneous equations, as far as attempt at subtraction $y = 2.5$ $x = 4$	✓ ✓ ✓ ✓ ✓	B1 B1 M1 A1 A1	Sight of $8x + 12y = 62$ or equivalent e.g. $2x + 3y = 15.5$ Sight of $8x + 16y = 72$ or equivalent e.g. $x + 2y = 9$ F.T. 'their equations'. Allow 1 'slip', if multiplication used, but not in 'equated variable' for M1 <u>only</u> . F.T. from their 1 st variable. (Substitution in any relevant equation.)
Ribbon marking for 16(a) and 16(b). 16.(a) 0.3 on 'Hereford' branch. $0.7 \times P(\text{Yes}) = 0.42$ $P(\text{Yes}) = 0.6$ 0.6, 0.4, 0.6 and 0.4 correctly placed.	✓ ✓ ✓ ✓	B1 M1 A1 A1	Allow their notation for P(Yes). F.T. 'their P(Yes)', if between 0 and 1 but not 0.5.
Ribbon marking for 16(a) and 16(b). 16(b) 0.3×0.4 $= 0.12$		M1 A1	F.T. 'their values' if both between 0 and 1.
17. $4n - 23 > n$ or $n < 4n - 23$ or equivalent. (least number of marbles =) 8	✓✓ ✓✓	B2 B2	B1 for $4n \pm \dots > n$ OR B1 for $4n - 23 > an + b$ $a \neq 0$. OR B1 for $4n - 23 \geq n$. B0 for $4n - 23 < n$ F.T. from 'their <u>inequality</u> ', if of equivalent difficulty. (e.g. $4n - 23 > n + 23$ giving an answer of 16) B1 for sight of $n > \frac{23}{3}$ or equivalent. (With similar F.T. answer e.g. $n > 46/3$ from above example of $4n - 23 > n + 23$) OR allow B1 for $n > 7$ OR $n \geq 8$ (With similar F.T. answer e.g. $n > 15$ from above example of $4n - 23 > n + 23$)