GCSE MARKING SCHEME

AUTUMN 2017

GCSE
MATHEMATICS
UNIT 2 - INTERMEDIATE TIER
3300U40-1

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INTRODUCTION

This marking scheme was used by WJEC for the 2017 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.

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GCSE Mathematics Unit 2: Intermediate Tier Autumn 2017 Final Marking Scheme	Mark	Comments
1.(a) 0·08 × (£)3.25 OR 0·08 × 325(p) or equivalent = (£)0.26 OR 26p	M1 A2	 Mark final answer. Allow £0.26p. If A2 not awarded allow M1A1 for sight of 0.26 or 26 in working (e.g. 0.26p or £26) Unsupported final answer of (£) 2.99 OR (£) 3.51 gains M1A1.
1.(b) 182 − 114 = 68	B2 B1	B1 for sight of 182 or 114. F.T. 182 – 'their 114' or 'their 182' – 114 correctly evaluated. B1 only for 182 − 0·22(..) = 181·77.. B0 for an unsupported 181·77….
1.(c) 9·32	B2	B1 for sight of 9·3 or 9·30 or 9·31(……). Mark final answer.
2.(a) 2 (days) 5 (hours) 50 (minutes)	B2	B1 for 2 (days) 5 (hours) n (minutes). B1 for 2 (days) n (hours) 50 (minutes). B1 for n (days) 5 (hours) 50 (minutes). Mark final answer.
2.(b) $\frac{16 \times 60 + 20}{5}$ (=980/5 = 196) OR (3 +) $\frac{1 \times 60 + 20}{5}$ = 3 (hours) 16 (minutes)	M1 A1	 C.A.O. 16(.)20 ÷ 5 = 3(.)24 is M0A0 (196 ÷ 60 =) 3(.)26 is M1A0. (The 196 implied).
3.(a) 11 OR 18.	B1	B1 for either or both. Answer space takes precedence.
3.(b) (Original mean =) 9 (New mean = 9 – 1 =) 8 (New total = 8 × 4 =) 32 (Number added =) 5	B1 B1 B1 B1	From (6 + 8 + 13) ÷ 3. F.T. 'their derived or stated original mean' – 1. Do not allow 27 – 1 = 26 as a new mean for this B1. Unambiguously showing 'new mean' = 8 gains B1B1 F.T. 'their derived or stated new mean' × 4. Unambiguously showing 'new total' = 32 gains B1B1B1 F.T. 'their identified new total' – 27. Answer space takes precedence for final answer. A final answer of 5 implies all four B1 marks.
4.(a) 270°	B1	
4.(b) east	B1	
4.(c) 220°	B1	
5. (Area =) $\frac{(17{\cdot}3 + 8{\cdot}2)}{2}$ × 9·4 or equivalent = 119·85 ISW cm^2	M1 A1 U1	Allow M1 for correct intent seen. e.g. 17·3 + 8·2 × 9·4 ÷ 2 (M0 if only unsupported answer of 55·84 given.) Accept 120, 119·8 or 119·9 from correct work. Independent of all other marks.
6.(a) $\frac{54}{129}$ (× 100%) = 42 (%)	M1 A2	Allow 0·42 or 0·418 or 0·419 to imply M1. A1 for 41·8(….) or 41·9 or 41·90
6.(b) Use of $\frac{25{\cdot}8}{6}$ 21·5 AND 4·3	M1 A1	Sight of 4·3 (or 21·5) implies M1. Accept in either order.

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7. (Probability of a Y =) $\frac{2}{13}$ or equivalent	B1	C.A.O. (B1 is implied by an answer of 50.)
$\frac{2}{13} \times 325$	M1	F.T. 'their 2/13', only if <1 AND 2/a or b/13.
= 50	A1	Must be given as a <u>whole number</u> (truncated or rounded) if following through 'their fraction'. Allow B1M1A0 for a final answer of 50/325. If no marks awarded SC1 for sight of 25.
8. (Area of the circle =) $\pi \times 4{\cdot}2^2$ OR (Area of semi-circle =) $\frac{\pi \times 4{\cdot}2^2}{2}$	M1	
= 55·4(…)(cm^2) OR 27·7(…)(cm^2)	A1	Accept an answer that rounds to 55·4 cm^2 OR an answer that rounds to 27·7 cm^2
(Side of square or Diameter =) 8·4 (cm).	B1	Look at diagram. May be seen in further work.
(Area of the square =) = 70·56(cm^2)	B1	Implies previous B1. Allow 70·6.
(Shaded area = 70·56 − $\frac{55{\cdot}4}{2}$) = 42·85 (cm^2)	B1	F.T. 'their area of square'− 'their area of <u>semi circle</u>.' (Allow tolerance of ±0·05 for the subtraction.)
	OC1	Organisation and Communication. 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
	W1	Accuracy of writing. 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.		Look at diagram.
4x – 3 = x + 48	M1	
3x = 51	A1	
x = 17	A1	F.T. from ax = b. a ≠ 1. Unsupported x = 17 gains M1A1A1
ABC (or/and ACB) = 65(°)	B1	F.T. using 'their derived or stated value for x' substituted in either (4x – 3) or (x + 48).
y = 180 – 2 × 65	M1	F.T. 180 – 2 × 'their 65' <u>derived</u> using 'their x' in either angle'. OR F.T. 180 – 'their derived ABC' – 'their derived ACB' (Must be using a consistent value for x.)
= 50(°)	A1	A0 if error in either 'deriving ABC' or 'deriving ACB'. A0 if 'y' is negative on FT. *<u>Alternative method</u>* *M1A1A1 as before.* *y + (4x−3) + (x+48) = 180 or equivalent B1* *y = 135 − 5×17 FT 'their derived or stated 17' M1* *y = 50(°) A1*

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10.(a) $18p^9$	B1	
10.(b) $\frac{g^6}{4}$	B1	
10.(c) 1	B1	
11. One correct evaluation $4 \le x \le 5$ 2 correct evaluations $4{\cdot}25 \le x \le 4{\cdot}45$, one < 91, one > 91. 2 correct evaluations $4{\cdot}25 \le x \le 4{\cdot}35$, one < 91, one > 91. $x = 4{\cdot}3$	 B1 B1 M1 A1	*Correct evaluation regarded as enough to identify if <91 or >91. If evaluations not seen accept 'too high' or 'too low'.* *Look out for testing $x^3 + 2x - 91 = 0$* x — $x^3 + 2x$ 4 — 72 4·1 — 77·121 4·2 — 82·488 4·3 — 88·107 4·4 — 93·984 4·5 — 100·125 — 4·25 — 85·26.... 4·6 — 106·536 — 4·35 — 91·01... 4·7 — 113·223 — 4·45 — 97·02... 4·8 — 120·192 4·9 — 127·449 5 — 135
12.(a) $35^2 = 21^2 + AB^2$ OR $(AB^2 =)\ 35^2 - 21^2$ $(AB^2 =)$ 784 or $(AB =) \sqrt{784}$ (AB =) 28(cm) (Area ABC =) $\frac{21 \times 28}{2}$ $= 294(cm^2)$	 M1 A1 A1 M1 A1	*Work for 12(a) must be seen in 12(a) and not awarded retrospectively from work in 12(b).* In (a) allow correctly working in metres BUT final answer must be in cm^2. F.T. 'their784' if M1 gained and if <1225 F.T. (21 × 'their stated or shown AB') / 2 AND (AB ≠ 35 and ≠ 21) <u>*Alternative method.*</u> *Cos C = 21/35* — *M1* *C = $\cos^{-1}$ 0·6* — m1 *ACB = 53(·13..)(°)* — *A1* *F.T. 'their 53°'* *Area ABC = ½ × 21 × 35 × sin 53·13°* — *M1* *= 294(cm^2)* — *A1* *Answer from a 'FT angle' must be correct to at least 1dp. (Note using 53° leads to 293·498….)*
12.(b) Use of 'Volume = area ABC × length'. (Volume =) 294 × 200 OR 0·0294 × 2 = 58800 cm^3 OR 0·0588 m^3.	 M1 m1 A1	*Work for 12(b) must be seen in 12(b).* Allow this M1 even if using 'mixed units'. Where 'area ABC' is that shown in 12(a) or calculated using 'their AB' from 12(a) AND the length is '2×10^n'. (Note: using 'their AB' as an area is M0.) F.T. 'their area of ABC' OR 294 AND using 'consistent' units. Correct units must be shown. Mark final answer. An unsupported 588×10^n implies M1.

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13. (LCM of 12, 18 and 24 =) 72 or equivalent, e.g. 2×2×2×3×3. (HCF of 36 and 54 =) 18 or equivalent, e.g. 2×3×3. (72 ÷ 18 =) 4	B2 B2 B1	B1 for any other common multiple <u>identified.</u> e.g 144, 432, 5184 etc. B1 for any other common factor <u>identified.</u> i.e. 2, 3, 6, 9. Do not accept 1. F.T. only if <u>at least one B2 gained</u>. B0 for 72/18. Unsupported 4 gains 5 marks.
14(a) $2x + 2y = 7y - 3$ OR $x + y = \frac{7y-3}{2}$ $2x = 5y - 3$ OR $x = \frac{7y-3}{2} - y$ $x = \frac{5y-3}{2}$	B1 B1 B1	F.T. until 2nd error provided of equivalent difficulty. Accept $x = \frac{5y}{2} - \frac{3}{2}$ OR $x = \frac{-5y+3}{-2}$ OR $x = 2\frac{1}{2}y - 1\frac{1}{2}$ or equivalent. Must have 'x = '. An answer of $\frac{5y-3}{2}$ gains B1B1B0 (missing 'x =') Mark final answer.
14.(b) $n^2 + 2$	B2	Mark final answer. B1 for $n^2 \pm$ …., not for n^2 alone B0 for $an^2 \pm$ ….. where $a \neq 1$.
15 $QS = \frac{8}{\sin 38}$ $= 13$ or $12{\cdot}99(..)$ $\tan x = \frac{15}{12.99(..)}$ $x = \tan^{-1}(15/12{\cdot}99\ldots)$ $= 49(\cdot098..°)$	M2 A1 M1 m1 A1	M1 for $\frac{8}{QS} = \sin 38$. Accept M1 for $\frac{QS}{\sin 90} = \frac{8}{\sin 38}$ M2 for $QS = \frac{8 \times \sin 90}{\sin 38}$ F.T. 'their 12.99(..)', stated or shown on diagram. Mark final answer. If FT leads to a non-integer value, allow to the nearest degree.
16. (a) 0·13 on 'car' branch. 1/3 on 'other day' branches.	B1 B1	 Do not penalise if one of branches left blank.
16.(b) $1 - 0{\cdot}87 \times \frac{2}{3}$ OR $0{\cdot}87 \times \frac{1}{3} + 0{\cdot}13 \times \frac{2}{3} + 0{\cdot}13 \times \frac{1}{3}$ $= 0{\cdot}42$	M2 A1	M1 for sight of 0·87 × 2/3. F.T. 'their 0·13' and 'their 1/3'. C.A.O. If M0 allow SC1 for sight of $0{\cdot}13 \times \frac{2}{3}$ (= 0·0866..) <u>seen in part (b).</u> (This for travelling by car on the first day.)

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