GCSE MARKING SCHEME

SUMMER 2017

GCSE (NEW)
MATHEMATICS - UNIT 2 (INTERMEDIATE)
3300U40-1

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.

GCSE MATHEMATICS Unit 2 : Intermediate Tier Summer 2017	✓	Mark	MARK SCHEME Comments (Page 1)
1.(a) 0·39 × (£)576 or equivalent = (£)224.64 ISW		M1 A1	Do not accept approximating e.g. 10%=£58 etc. Allow £224.64p and 22464p but not 22464.
1.(b) 43		B2	B1 for sight of 42·8(…..) or 42·9 or 42 $^{6}/_{7}$ or 300/7. Allow SC1 for 42. B0 for 300 ÷ 7.
1.(c) 40		B1	Accept embedded answers e.g. 0·25 × 40 = 10.
1.(d) $\frac{1}{12}$ or equivalent fraction		B1	Mark final answer. B0 for $\frac{0{\cdot}5}{6}$, 0·083.. etc.
1.(e) $\frac{10}{12}$		B1	
2. FALSE TRUE TRUE TRUE FALSE		B3	For all 5 correct. B2 for 4 correct. B1 for 3 correct.
3. (7 × 3 =) 21		B2	B1 for sight of 7 × a (or a × 7) OR b × 3 (or 3 × b) OR 7 OR 3 unambiguously identified.
4.(a) 5		B1	Allow unambiguous indication of an answer of 5.
4.(b) 3 (n + 7) or 3 × (n + 7) or (n + 7)3 or (n + 7) ×3 or 3n + 21		B2	B1 for n + 7 × 3 OR 3 × n + 7 (bracket omitted). Penalise −1 any further incorrect work, e.g. '(n + 7) ×3 = n + 21' is B2 – 1 = B1, 'n + 7 × 3 = n + 21 is B1 – 1 = B0, '3 × n + 7 = 3n + 7' is B1 – 1 = B0.
5. 8, 15 and 16 OR 9, 13 and 17 OR 10, 11 and 18.		B2	All three numbers must be less than 25. B1 for three numbers with a range of 8. B1 for three numbers whose total = 39.
6.(a) −3, −1 and 1		B2	B1 for any two correct in the correct positions OR B1 for −5, −3 and −1 OR B1 for −1, 1 and 3.
6.(b) 4n + 3		B2	B1 for sight of 4n or n4 (but not $4n^{k}$ k≠1). Mark final answer.
7.(a) 0·26		B1	B0 for 13/50, 26/100 etc.
7.(b) $\frac{7}{50}$ × 3000 or equivalent = 420		M1 A1	Only allow misread if 300 or 30000 used. 420/3000 gains M1A0. Mark final answer.
7.(c) $\frac{1}{6}$ × 3000 or equivalent = 500		M1 A1	Only allow misread if 300 or 30000 used. 500/3000 gains M1A0. Mark final answer. Allow M1A0 for 480 or 510 or 498 as implying 1/6 to be 0·16 or 0·17 or 0·166.

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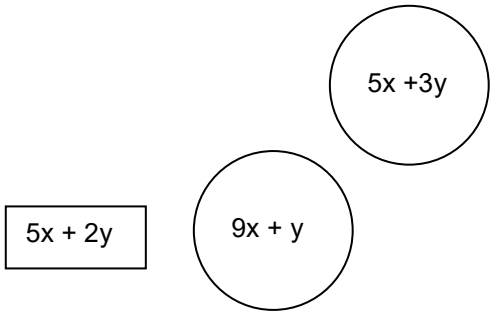
8. (Angle DOC or exterior angle =) $\frac{360(°)}{5}$ $= 72(°)$ (x =) $\frac{180 - 72}{2}$ $= 54(°)$	✓ ✓ ✓ ✓	M1 A1 M1 A1	*Answers/working may be seen on diagram.* Sight of 72 (even x = 72) gains M1A1. FT 'their 72' (but not 60°). *Alternative method* *(Sum of interior angles =)* *(5 – 2)×180° or equivalent* *M1* *= 540(°)* *A1* *FT 'their interior angle sum' (≠ 900)* *(x =) ½ × (540 ÷ 5)* *M1* *= 54(°)* *A1*
9.  		B3	B1 for 5x + 3y B1 for 5x + 2y Bottom circle F.T. 'their 5x + 2y' + 4x – y for B1. Penalise 'correct' but unsimplified expressions −1 once only.
10. (BC =) (24 – 2x7)/2 (BC =) 5(cm) (Area CDEF =) $\frac{(7 + 3)}{2}$ × (9 – 5) or equivalent. = 20 (cm^2) Organisation and Communication. Accuracy of writing.	✓ ✓ ✓ ✓ ✓ ✓	M1 A1 M1 A1 OC1 W1	*Lengths may be seen on diagram.* A clearly shown incorrect method for finding CD is M0A0 otherwise CD=4(cm) implies this M1A1. F.T. 'their derived 5' OR F.T. $\frac{(7 + 3)}{2}$ × 'their stated or shown length CD (<9)' Allow M1 for correct intent e.g. '7 + 3 × 4 ÷ 2' then A0. Ignore any further attempt to find total area of whole shape if area of CDEF seen. 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 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.

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11.(a) 25·1		B2	B1 for 25(·….).
11.(b) −14·3		B2	B1 for 14·3 OR −14·2(…..)
12. 3x − 2 + 2x + 1 + 5x − 9 = 180 10x = 190 x = 19 Substituting x = 19 into at least one expression. (3x – 2 =) 55(°) (2x + 1 =) 39(°) (5x – 9 =) 86(°) (So not a right-angled triangle)	✓ ✓ ✓ ✓ ✓	M1 A1 A1 M1 A1	F.T. from ax = b. Allow all 3 marks for x = 19. If x ≠ 19 F.T. 'their derived value of x'. F.T. for this A1 if x ≥ 2. Any **two** of these expressions correctly evaluated with no incorrect evaluation, provided the sum of the two found is > 90. (statement not required)
13. One correct evaluation $3 \le x \le 4$ 2 correct evaluations $3{\cdot}65 \le x \le 3{\cdot}85$, one < 0, one > 0. 2 correct evaluations $3{\cdot}65 \le x \le 3{\cdot}75$, one < 0, one > 0. $x = 3{\cdot}7$	 ✓ ✓ ✓ ✓	 B1 B1 M1 A1	*Correct evaluation regarded as enough to identify if negative or positive. Evaluations can be rounded or truncated. If evaluations not seen condone 'too high' or 'too low'.* *Look out for testing for $x^3 - 2x = 45$.* x $x^3 - 2x - 45$ 3 −24 3·1 −21·409 3·2 −18·632 3·3 −15·663 3·4 −12·496 3·5 −9·125 3·55 −7·361... 3·6 −5·544 3·65 −3·672... 3·7 −1·747 3·74 −0·166... 3·8 2·272 3·75 0·234... 3·9 6·519 3.85 4.366… 4 11 Mark final answer.
14. $16{\cdot}9^2 = 6{\cdot}5^2 + MN^2$ or equivalent. $(MN^2) = 243{\cdot}36$ or $(MN) = \sqrt{243{\cdot}36}$ (MN =) 15·6(cm)		M1 A1 A1	Allow M1 for $16{\cdot}9^2 - 6{\cdot}5^2$. C.A.O.
15. Correct construction of 90° at point B. Correct construction of angle BAC = 60°.		B2 B1	With sight of accurate 'method arcs'. e.g . (i) AB extended with arcs either side of B on extended line AB (or line AB extended by 7cm) AND arcs above or below point B). (ii) construction of 60°, 120° and a bisection. B1 for complete method but line not drawn. With sight of accurate 'method arcs' and line drawn. If all three marks gained but triangle not completed penalise −1 mark. (Treat reversal of angles as a misread.)

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16. $\frac{QR}{18} = \tan 24(°)$ $QR = 18 \times \tan 24(°)$ $= 8(\cdot 01..)(cm)$		M1 m1 A1 3	OR $\frac{QR}{\sin 24} = \frac{18}{\sin 66}$ $QR = \frac{18 \times \sin 24}{\sin 66}$ C.A.O.
17.(a) 0·3(0) on 'box C branch'.		B1	
17.(b) Sight of $0{\cdot}45 \times 0{\cdot}7$ OR $0{\cdot}25 \times 0{\cdot}4$ OR $0{\cdot}3 \times 0{\cdot}8$ $0{\cdot}45 \times 0{\cdot}7 + 0{\cdot}25 \times 0{\cdot}4 + 0{\cdot}3 \times 0{\cdot}8$ $(0{\cdot}315 + 0{\cdot}1 + 0{\cdot}24)$ $= 0{\cdot}655$ or 131/200 or equivalent ISW		 B1 M1 A1	FT 'their 0·3' from box C branch, only if, between 0 and 1. Provided less than 1.
17.(c) $\frac{1}{3}$		B1	F.T. for the fraction that is the nearest to 1− 'their 0·655' provided 0<'their 0·655'<1 Correct answer of 1/3 gains B1 regardless.
18.(a) $x(x^2 - 5)$		B1	
18.(b) $2x^2 + 5x - 12$		B2	B1 for $2x^2 + kx - 12$ OR $2x^2 + 5x + k$
18.(c) $(x - 7)(x + 4)$ ISW		B2	B1 for $(x \ldots 7)(x \ldots 4)$.
19.(a) $3y = 2x + 7$		B1	
19.(b) $y = -\frac{x}{5} + 3$		B1	
20. $360 - 2 \times 37$ $= 286(^\circ)$		M1 A1	SC1 for sight of 74(°).
21. $\frac{BD \times 5}{2} = 35$ $BD = 14(cm)$ $\cos x = \frac{14}{32}$ $x = \cos^{-1} 0{\cdot}4375$ $x = 64(°)$	✓ ✓ ✓ ✓ ✓	M1 A1 M1 m1 A1	 May be seen on the diagram. Note : If they state that AB = 14cm, or indicate on the diagram that AB = 14cm then it is M0A0 as an incorrect method used for area of a right-angled triangle (however an unattached 14cm has to be given the benefit of the doubt and be awarded M1A1). FT 'their stated or shown length BD'. FT has to use 'their BD' (not CD). Accept answer rounded or truncated. [e.g. if their BD = 7, then accept 77(·36…°)]