GCSE MARKING SCHEME

AUTUMN 2018

GCSE
MATHEMATICS – COMPONENT 1 (FOUNDATION TIER)
C300U10-1

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.

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
1.(a)(i) 51	B1	
(a)(ii) 705[.00]	B1	
(a)(iii) 7	B1	
(a)(iv) $\dfrac{150}{10} \times 4$ or equivalent full method	M1	Any partitioning method must be complete and correct; e.g. 'their 10% of 150' $\times$ 4 or 'their 50% of 150' $-$ 'their 10% of 150';
60	A1	
(b) $5 - 3 \neq 8$	B1	CAO
	(6)	
2.(a) Point marked at $(-4, 3)$	B1	
(b) $(-4, 3)$	B1	FT their plotted point
(c) 32 cm	B2	B1 for either
	(4)	
3. $4c + 15$	B2	B1 for a correct unsimplified expression e.g. $c + c + c + c + 15$ If no marks award SC1 for an answer of 3c + 15
	(2)	
4.(a) Correct reflection	B1	Allow freehand; mark intent
(b) Parallelogram drawn	B1	Allow freehand; mark intent
	(2)	

1
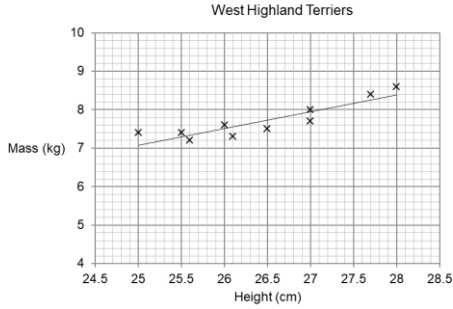
5.(a)(i)	32	B1	Allow −32
(a)(ii)	−40	B1	
(b)(i)	−3 and 4	B2	In either order B1 for two numbers with opposite signs whose product is −12 or whose sum is 1
(b)(ii)	Correct solution e.g. 5 and −2 and −3 or 6 and −5 and −1	B2	In any order B1 for three numbers with two negative whose product is 30 or whose sum is 0 or for −5 and 2 and 3 or −6 and 5 and 1, three numbers whose product is −30 and whose sum is 0.
		(6)	
6.(a)	4 × 4500 or equivalent 18 000	M1 A1	Or $\frac{4500}{15} \times 60$ If no marks then allow SC1 for a correctly evaluated $\frac{\text{distance}}{\text{time}}$ calculation e.g. $\frac{4500}{15} = 300$ (metres per min)
(b)	18	B1	FT 'their 18 000'
		(3)	
7.(a)	112	B2	B1 for evidence of 2 correct costs from 40, 24, 18, 30 or for 11 × 10 + 10 ÷ 2 or equivalent
(b)	16 × 5 + 12.50 or equivalent (£)92.50	M1 A1	If no marks, SC1 for an answer of 204.50 (including the 112)
(c)	$\frac{6}{600}$ [×100] oe 1	M1 A1	Or 1% is 600 ÷ 100; may be in steps
(d)(i)	12 : 1 or equivalent	B1	e.g. 60 : 5
(d)(ii)	$(60 \div 12) \times 3$ or equivalent 15	M1 A1	May be seen in stages
		(9)	

2

8.(a)	6	B1	
(b)	Yes with valid explanation e.g. 'because 52cm × 2 = 104 cm' or 'the diameter will be 104 cm = 1.04 m' or 'the diameter is more than 100.'	B1	
(c)(i)	Use of 12 or 10 bags	M1	
	Suitable calculation e.g. (£)7[.00] × 12 or (£)7.2[0] × 12 or (£)7[.00] × 10 or (£)7.2[0] × 10 or (£)7.19× 10	M1	or equivalent; allow (£)7.5[0] ×12 or (£)7.5[0] ×10 or a less accurate rounding e.g. (£)10 ×12 or (£)10 ×10

	Correct evaluation e.g.
	(£)84[.00] or (£)86.4[0] or
	(£)70[.00] or (£)72[.00] or
	(£)71.9[0]
		A1	Method must be shown;
			allow (£)90[.00] or (£)75.00
			
			If first M0, allow
			   M1 for (£)7[.00] × 18 or (£)7[.00] × 20 or
			      (£)7.2[0] × 18 or (£)7.2[0] × 20 or
			      (£)7.19 × 20 or
			      (£)7.5[0] × 18 or (£)7.5[0] × 20
			      or equivalent
			   or for a less accurate rounding e.g. 10 × 20
			
			and
			   A1 for correct evaluation e.g.
			      (£)126[.00] or (£)140[.00] or
			      (£)129.6[0] or (£)144[.00] or
			      (£)143.80 or
			      (£)135[.00] or (£)150[.00]
			
			If M1 M0, allow SC1 for
			[12 × 7.19 =] £86.28 rounded to £86[.00] or
			£90[.00]

(c)(ii)	Appropriate answer e.g. 'Under-estimate as I rounded down.'	E1	Dependent on their calculation for (c)(i); cannot be awarded if (c)(i) is not attempted. NB compare with £86.28
		(6)	
9. (a)	30 × 50(p) or 30 × 8.5 − 30 × 8	M1	or equivalent
	(£)15(.00) or equivalent	A1	Allow 1500p if final answer in working space or if £ on answer line is deleted.
(b)	(30 + 2 × 5) × 6(.00)	M1	or equivalent
	(£)240(.00)	A1	If no marks award SC1 for [5.55 × 40 =] (£) 222
(c)	160 ÷ (30 + 2 × 5)	M1	seen or implied
	(£)4 (per hour) or equivalent	A1	
	2016 Under 18	B1	Implies M1 A1 provided not from wrong working
		(7)	

10.(a)(i)	Pink	B1	
(a)(ii)	0	B1	Accept zero or nil etc; do not accept none or impossible etc
(a)(iii)	$\dfrac{3}{10}$ or equivalent	B2	B1 for $[1 -] \dfrac{4+3}{10}$ or for a numerator of 3
(b)	10	B2	B1 for 30 or for $\dfrac{12}{30}$ seen or for 18 seen
		(6)	
11.(a)	Carmen indicated with valid explanation e.g. 'The range is smaller'.	E1	
(b)	12	B3	B1 for (15 + 12 + 13 + 13 =) 53 and B1 for $5 \times 13 = 65$ or for $\dfrac{53 + \ldots}{5} = 13$ or $5 \times 13 - 53$ seen
		(4)	
12.(a)	$\dfrac{2}{3}$ $\quad$ $\dfrac{30}{45}$ $\quad$ $\dfrac{4}{6}$	B2	B1 for any two correct with none incorrect or for all 3 correct with one extra
(b)	Valid explanation e.g. '$\dfrac{3}{21}$ is the same as $\dfrac{1}{7}$ (not 3 times it).'	E1	Accept e.g. '$3 \times \dfrac{1}{7} = \dfrac{3}{7}$ (not $\dfrac{3}{21}$)' or '$\dfrac{3}{21} = \dfrac{1}{7}$ (not $\dfrac{3}{7}$)'
(c)	$\dfrac{9}{12} + \dfrac{2}{12}$	M1	or equivalent calculation with correct common denominator
	$\dfrac{11}{12}$ or equivalent	A1	
		(5)	
13. (a)	Correct shape drawn at (2, 2) (2, 4) (4, 4) (6, 2)	B2	B1 for a rotation of 90° anti-clockwise about (0, 0) or for 3 out of 4 points plotted correctly and joined
(b)	Point *P* marked at (9, −2)	B1	Allow unlabelled if unambiguous
		(3)	
14.(a)	750 ÷ 300 × 20 or equivalent	M1	Or 20 + 20 + 10 or for sight of 2½ (batches)
	50	A1	
(b)	(flour left =) 1800 − 750 or 1050	M1	
	1050 ÷ 200 or 200×5 (= 1000)	m1	or equivalent; FT 'their 1800 – 750'; may be implied by e.g. 200, 400, 600, 800, 1000
	5	A1	Not from wrong working; an answer of 5.25 is M1 M1 A0 only.
		(5)	

4

15.(a)	$\dfrac{18}{4} \times 3$ or equivalent	M1	
	13.5 or equivalent	A1	Do not allow $\dfrac{27}{2}$ etc, as in context
(b)	$48 \div (7 + 3 + 2)$	M1	May be implied by sight of 28 or 8.
	$\times (7 - 2)$	m1	Or equivalent
	20	A1	
		(5)	
16.(a)	100 (cm^2)	B1	
(b)	8	B1	
(c)	$8 \div 100$ or $\dfrac{8}{100}$	M1	or equivalent FT 'their 100' and 'their 8'
	0.08	A1	FT 'their 100' and 'their 8'
		(4)	

17.(a)	$\dfrac{360-128}{2}$ or $180-\dfrac{128}{2}$ (= 116)	M2	Or M1 for $360-128$ (= 232) or $128 \div 2$ (= 64)
	$\dfrac{180-116}{2}$	m1	FT 'their 116' ; dependent on M2
	32	A1	***Alternative method using exterior angles:*** *$128 \div 2$* *M1* *64 is BAC + ABC seen or implied and $64 \div 2$* *M2* *32* *A1*
(b)	Valid combination of angles/reasons e.g. $a = 90$ angles on a straight line $b = 90$ vertically opposite $c = 55$ angles in a quadrilateral or Top is parallel to middle corresponding angles $d = 55$ angles on a straight line or $e = 55$ angles on a straight line	B2	NB Other valid reasons are possible, but reasons based on parallel lines must be justified. Longer methods must be complete for B2 B1 for two correct angles with at least one reason stated or for 3 correct relevant angles with no reasons stated and no incorrect angles seen or for showing the top is parallel to the middle or the middle is parallel to the bottom
	and completion of argument e.g. '(Parallel as) alternate angles are equal.' or 'Middle is parallel to bottom corresponding angles (so top parallel to bottom).'	E1	 Do not accept 'F angles' or 'Z angles' as reasons.
		(7)	
18.(a)(i)	2	B1	
(a)(ii)	5	B1	
(b)(i)	8×10^7	B2	B1 for $... \times 10^7$ or for 80 000 000
(b)(ii)	$(3 \times 10^5 =)$ 300 000 or $(40\,000 =)$ 4×10^4	B1	
	$\dfrac{3 \times 10^5}{4 \times 10^4}$ or $\dfrac{300\,000}{40\,000}$ = 7.5 (so more than 7)	B1	***Alternative method 1:*** *$7 \times 40\,000 = 280\,000$* *B1* *$(3 \times 10^5 =)$ 300 000 (so more than 7)* *B1* ***Alternative method 2:*** *$\dfrac{7 \times 40\,000}{300\,000}$* *M1* *$\dfrac{280\,000}{300\,000}$ (which is less than 1)* *A1*
		(6)	

19.*(a)	(£)18(.00)	B1	
(b)(i)	They are in direct proportion indicated	B1	
(b)(ii)	4.5	B2	B1 for $\frac{45}{10}$ or equivalent
	The cost (in £) per mile	B1	or equivalent Allow £ per mile NB An answer of £4.5(0) per mile earns 3 marks
		(5)	
20.*(a)	Correct line of best fit	B1	Following trend with some points above and below
(b)	Answer in the range 7.5 to 8 (kg)	B1	Or FT their line for an answer outside this range
(c)	No with valid reason e.g. 'It is too tall' or 'A dog of mass 8.2 kg should have a height of about 27.5 cm'	E1	Allow e.g. 'For a dog of 35 cm, 8.2 kg is not heavy enough.' or 'Its height does not match its weight.' Allow e.g. 'It is too far off the line of best fit.' provided B1 has been awarded in (a).
		(3)	
21.	$(BC =) 5$ $12^2 + 5^2 (= 169)$ $x^2 = 169$ or $x = \sqrt{169}$ $(x =) 13$	B1 M1 A1 A1	 FT 'their 5' FT 'their 5' FT from M1, if possible, for the correctly evaluated square root of 'their 169' provided 'their answer' > 12. Accept an unsupported 13 (cm) If no marks award SC1 for sight of $AC = \frac{1}{2} \times PR$ or equivalent ***Alternative method:*** $24^2 + 10^2 (= 676)$ M1 $x^2 = 676$ or $x = \sqrt{676}$ A1 $(PR =) 26$ A1 $(x =) 13$ B1
		(4)	

7

22.*		
5 park keepers pruning after 1 hour	B1	seen or implied
10 trees left to prune	B1	seen or implied
Fully correct method in steps or statements e.g. | P/keepers	Hours	Trees | |---|---|---| | 3 | 2 | 6 | | 1 | 2 | 2 | | 5 | 2 | 10 |	M1	seen or implied; FT 'their derived 10' or $2 \times \dfrac{3}{5} \times \dfrac{10}{6}$ Allow equivalent working in minutes
2 (hours)	A1	Seen or implied
3 (hours)	A1	FT 'their 2' provided M1 has been awarded
	(5)	
23.*(a) $(x-3)(x+5)$	B2	B1 for $(x \ldots 3)(x \ldots 5)$
(b) 3, –5	B1	Correct or correct FT; FT 'their $(x \pm a)(x \pm b)$' from (a)
	(3)	

8

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24.*(a)	$x = -1.6$ or -1.7	B1	
	$y = 1.3$ or 1.4	B1	If no marks then SC1 for a value of x between -1.6 and -1.7 and a value of y between 1.3 and 1.4 or for correct values given as coordinates
(b)	$2a + 3c = 72$ and $3a + c = 66$	B1	May use other letters or words throughout this part
	Method to eliminate an unknown e.g. equal coefficients and subtraction	M1	FT their equations provided one is correct and the other is linear in the same pair of unknowns or rearranges one equation and substitutes into the other Allow one error in one term, not in the equated coefficients
	Finds one unknown	A1	CAO; $a = 18$ or $c = 12$
	Finds the other unknown	A1	FT 'their a' or 'their c' used in one of their equations
	(£)15(.00)	B1	FT 2('their derived a') + 2('their derived c') – 45 provided 2('their derived a') + 2('their derived c') is greater than 45
			Alternative method: Adult ticket costs £18, child ticket costs £12 found using trials *B4* (£)15(.00) FT 2('their derived a') + 2('their derived c') – 45 provided 2('their derived a') + 2('their derived c') is greater than 45 *B1*
		(7)	

25.*		
(Proportion of tagged fish in sample is) $\frac{10}{100}\left(=\frac{1}{10}\right)$ or equivalent or (Proportion of sample tagged is) $\frac{10}{50}$ or equivalent	M1	Allow for e.g. '10 tagged out of 50'
$\frac{10}{50}=\frac{100}{500}$ or $\frac{10}{100}=\frac{50}{500}$ or 20% (of population) is 100 (fish) or equivalent	M1	Implies the first M1; allow for e.g. '100 tagged out of 500'; allow $\frac{100}{x}=\frac{10}{50}$ or $\frac{50}{x}=\frac{10}{100}$ or equivalent to score M1 M1
500 (fish) and do not allow fishing ticked or indicated	A1	CAO
	(3)	