GCSE MARKING SCHEME

SUMMER 2017

**GCSE (NEW)
MATHEMATICS - COMPONENT 2 (FOUNDATION)
C300U20-1**

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.

Eduqas Summer 2017 GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comments

1. (a) (£) 2.30 and (£)17.9(0)
    (£) 10.47
    (£) 30.67
	B1
	B1
	B1
		Allow 230(p) written outside the grid only.
		
		FT addition of their values, but do not accept errors in place value.

1. (b) (i) explains that by spending an additional £3 he will save £5. (ii) (£)35.49	E1 B1	e.g. "If he spends £3 extra he will save £5". "He has spent an extra £3.49 but his shopping is reduced by £5" "his shopping is £1.51 cheaper than if he had not spent the extra £3.49" or equivalent
1. (c) 6 x 8.95 = (£) 53.7(0) (7)	M1 A1	Or equivalent If no marks awarded, then SC1 for (£)71.6(0) (= 8 x 8.95)
2. (a) Explaining that the common denominator is incorrect e.g. '3 is not a factor of 20' '20 doesn't divide by 3' 'all the denominators do not go into 20'	E1	
2. (b) 40 (2)	B1	CAO
3. (a) Drawing of a parallelogram	B1	Can be a rhombus. Intention to have opposite sides parallel and no right angles must be clear.

3. (b) (i) ACB indicated
    (ii) NM indicated
    (iii) isosceles indicated
 	
(4)
	B1
	B1
	B1
		Any indication accepted (circle, tick etc.)

4. (a) 4/5 or 0.8 or 80%	B1	
4. (b) 2/5 or 0.4 or 40% (2)	B1	If no marks in (a) and (b): *Award SC1 if BOTH are 'correct' but using incorrect notation e.g.4:5 **AND** 2:5 or 4 in 5 AND 2 in 5.*
5. (a) x = 9	B1	Allow embedded answers
5. (b) y = 20	B1	Allow embedded answers
5. (c) 8z = 27 – 13 or 8z = 14 z = 1.75 or z = 14/8 or equivalent (4)	B1 B1	FT from one error. If 'their 14/8' can simplify to a whole number, then a whole number must be seen for 2nd B1. Allow embedded answers

	Mark	Comments
6. 'Greater' circled AND valid evidence e.g. 'the perimeter has increased from 36cm to 46cm' or equivalent, 'two extra 5cm lengths added' 'two extra sides'	E2	Award E1 for 'greater' circled and an incomplete reason given OR sight of 36(cm) and 46(cm).
7. (a) 3p	B1	
7. (b) 8a + 2b	B2	B1 for sight of either 8a or 2b. Mark final answer. Must be an expression to gain the B2.
7. (c) 6c	B1	
7. (d) 3a + 18	B1 (5)	Mark final answer.
8. 0.6(00), (0.615), (0.65(0)), 0.667 60% 0.615 0.65 $\frac{2}{3}$ or equivalent	M1 A1 (2)	For converting all numbers into a form for comparison. Accept sight of 0.66 or better for $^2/_3$. Allow M1 A1 for a correct unsupported answer. SC1 correct order, but reversed.
9. (a) Explanation. E.g. 'whole cubes need to fit into the box', 'can only fit 3 layers', '7 is an odd number so some space would be left' or 'he hasn't used the dimensions of the box'. '2 doesn't go into 7 exactly'	E1	
9. (b) Explanation. e.g. 'the answer is too big' or 'the number of cubes will be smaller' 'he has calculated too many'	E1	Do not accept 'his answer is incorrect'
9. (c) (number of cubes =) 4 x 5 x 3 = 60	M1 A1 (4)	Answer of '60' implies M1A1
10. For Team Beta: (160 x 4.60 = £)736 0.75 x 160 x 5.2(0) (= £624) 0.25 x 160 x 3 (= £120) Total income (£)744 Profit for Team Beta is (744 – 736 =) (£)8 Team Axis won, by £2	B1 M1 M1 A1 B1 E1 (6)	 Or equivalent Or equivalent FT (160 – 'their 120') × 3 May be implied by later working. FT 'their 744' – 'their 736' provided at least B1 or M1 awarded. FT difference between £10 and 'their £8', provided that the final B1 has been awarded. Final answer must have unit shown. *Alternative method: Considering profit* *(Profit per toy sold for £4.60 is £5.20 – £4.60 = £)0.60 AND* *(Loss per toy sold for £3 is £4.60 - £3 =£)1.60* *B1* *0.75 x 160 X 0.60* *M1* *0.25 x 160 x 1.60* *M1* *(£)72 and (£)64* *A1* *(Profit for Team Beta = £72 – £64 =£)8* *B1* *Team Axis won, by £2* *E1*
11. (a) Explaining that there is no mode. e.g. 'no number appears more than the others' 'there is more than one mode'	E1	Allow explanations that consider the mode such as 'there are two 6s, 7s and 9s'.

11. (b) (range =) 6 　　　(median =) 7	B1 B1	
11. (c) (i) 9	B1	
11. (c) (ii) explanation e.g. 'the median would be reduced'	E1 (5)	Allow calculation e.g. 'the median would become 6' or equivalent. FT 'their median' from (a) Do not allow 'it changes' or equivalent.
12. Calculates the total hours already used. (tennis 1/12 of 24 =) 2 (hours) OR (working 3/8 of 24 =) 9 (hours) (Hours left) 24 – (8 + 2 + 9) = e.g. '5 hours is more than 2 so yes, Omar will 　　　have enough time' 　　　'only adds to 21 (hours) so enough time' 　　'21 is less than 24, so yes' 　　'5 (hours left, Omar has) enough time'.	M1 m1 A1 (3)	FT provided 2 hours or 9 hours correct. (Candidates MUST have made a convincing attempt at calculating 2 AND 9) CAO
13. Listing times…..(9:00), 9:20, 9:40…. AND (9:00), 9:25, 9:50…OR Listing multiples of 20 and 25 or prime factors of 20 and 25. Sight of 100 as the LCM or the number of minutes OR one or two lists with 10.40 appearing correctly in at least one list. Time of 10:40 (a.m.)	M1 A1 A1 (3)	Allow for sight of 20, 40, 60… AND 25, 50, 75, … OR sight of 2 x 2 x 5 AND 5 x 5. FT 'their 100' provided M1 awarded.
14.　240 ÷ 5 x 8　or equivalent 　　　384(cm)	M2 A1 (3)	Award M1 for either 240 x 8　OR　240 ÷ 5 　　　　　　　(=1920)　　　(=48) CAO Accept embedded '384' e.g. '5/8 of 384 is 240'
15. (a) 1.25(m) = 125(cm) or 5.3(cm) = 0.053(m) 　　125 ÷ 5.3 or 1.25 ÷ 0.053 or equivalent 　　(=23.58) 　　　23 (reams)	B1 M1 A1	Seen or implied Allow M1 for 'their height' ÷ 5.3 with place value errors. CAO *Alternative build up method:* *Working with consistent units (cm or m)　B1* *Attempts to work in multiples of 5.3 to at least* *125(cm)　　　　　　　　　　　　　　M1* *23 (reams)　　　　　　　　　　　　　A1*
15. (b)　States or implies 'No', with a reason, e.g. No, he needed 14 reams. 　　No, he should have rounded up. 　　No, he hasn't got enough paper. 　　No, 13 reams is only 6500 sheets. 　　No, he is 30 sheets short.	E1 (4)	

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16. 4 black and 6 white	B2 (2)	B1 for attempt at diagram showing 10 squares or for black/white reversed or for showing equivalent fractions e.g. 4/10 and 6/10. OR B1 for black : white = 2n : 3n, where n>2 e.g. 6 black and 9 white.
17. (a) Statement that they need to divide by 5 e.g. 'they should divide by 5 not 4' 'this is a ratio of 1:3 (not 1:4)' (b) $400 \div 5$ AND $400 \div 5 \times 4$ or $400 - 400 \div 5$ 80 and 320	E1 M1 A1 (3)	Accept 'there are 5 parts not 4' Complete method for both shares. A0 if the answers are reversed.
18. (a) explanation e.g. 'population has increased', '3(.2) times as many', 'just over 3 times as much', 'new population is 3.2 or (more than) 3 times the original population', '320% means that the population has more than tripled'.	E1	
18. (b) 250000/40000 x 100 = 625 (%)	M1 A1 (3)	B1 for an answer with the digits 6 2 5.
19. $35 \div 40$ (x 100) $31 \div 35$ (x 100) 87.5 (%) AND 88.5(7….) (%) Or 0.875 AND 0.885(7…) (Jane had better result in) test 2	M1 M1 A1 E1 (4)	Or equivalent full method in each case Accept rounded or truncated from correct working. FT 'their two values' provided at least M1 awarded _Alternative method 1 – Equivalent fractions_ _Common denominator 280 M1_ _248/280 OR 245/280 M1_ _248/280 AND 245/280 A1_ _(Jane had better result in) test 2 E1_ _Alternative Method 2_ _$35 \div 40 = 0.875$ M1_ _Test 1 0.875 x 35 M1_ _ = 30.625/35 A1_ _(Jane had better result in) test 2 E1_
20. (a) 1, 4, 7 ISW	B2	B1 for 2 correct terms in correct positions. B1 for –2, 1, 4.

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20. (b) $3n - 2 = 1000$
 	
     (n=) 334 (whole number therefore yes)
     '1000 is the 334th term' or equivalent
	M1
	A1
	
	(4)
		An answer of 334 implies the M1 mark.
		
		Alternative methods:
		<u>*Trial and improvement:*</u>
		B2 for 334. B1 for at least two correctly evaluated trials with 300<n<400.
		<u>*Logic:*</u>
		e.g. 1002 is a multiple of 3 B1
		so 1002 is in the sequence 3n,
		so 1000 is in the sequence 3n – 2. B1

21. (a) $v = 53 + (-4) \times 6$ $v = 29$	M1 A1	Accept embedded answers throughout Q21
21. (b) $20 = u + 2 \times 6$ $u = 8$	M1 A1	
21. (c) $v - u = at$ $t = (v - u)/a$	M1 A1 (6)	If no marks, award SC1 for an answer of $t = (v + u)/a$

22. (a) 2015 1000×0.92 (=920)
 	
      2016 $1000 \times 0.92 \times 0.97$
             892.4(kg)
	M1
	
	M1
	A1
		Or equivalent full method.
		Allow in reversed order ($\times 0.97 \times 0.92$)
		FT 'their 920'
		CAO

22. (b) $(1000 - 892.4)/1000$ ($\times 100$) = 10.76 (%)	M1 A1 (5)	Or equivalent full method. FT 'their 892·4'

23. (a) Appropriate uniform scale on vertical
     axis
     At least 2 correct points calculated
 	
     Markers may find these useful:
<table><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>1</td><td>3</td><td>5</td><td>7</td><td>9</td><td>11</td></tr></table>
     Fully correct graph of $y = 2x + 5$
	B1
	
	B1
	
	B1
		Or use of $y = mx + c$ with line starting from (0,5) with gradient 2

23. (b) Yes, the gradients are the same (3)	E1 (4)	Accept e.g. Yes, because 'same slope' Accept Yes, because m = 3 or 'both 3x'.
24. (x =) 75 (°) (y =) 73 (°)	B1 B2 (3)	B1 for sight of $180 - 75 - 32$, or $180 - 107$, $180 - 75 - (180 - 100 - 48)$, or $180 - (360 - 100 - 48 - (180 - 75))$

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25. $\pi \times r^2 = 24$ $r^2 = 24 \div \pi$ $r = 2.76(3\dots \text{cm})$	M1 A1 A1 (3)	This implies M1 Accept r = 2.8(cm) or from correct working r = 3(cm) If no marks, award SC1 for an answer of 2.77 (cm)
26. 1.53×10^{15}	B1 (1)	
27.(a)(i) 062° 　　(ii) 288°	B1 B1	Do not accept 62°
27.(b) 1 : 250 000	B2 (4)	Allow 1 : 250 000 cm B1 for 1 cm represents 2.5 km or 2500 m, OR 8cm represents 2 000 000cm, or equivalent, correct units **must** be given, or 8 : 2 000 000 or equivalent Allow B1 for an answer of 1 : 2.5 km B0 for 1 : 2.5
28.(a) 4 (days)	B2	B1 for either a partial method, e.g. 9 people take 2 days to mow the same length, or 1 person takes 36 days (to mow twice as long), or 3 people take 12 days (to mow twice as long), OR B1 for a full method, equivalent to 2 × 3 × 6 ÷ 9, with an error in evaluation
28.(b) Assumption, e.g. 'all people work at the same rate', 'the grass verge that is twice as long is the same width as the other grass verge', 'same type of grass', 'weather is the same', 'same type of mower'	E1 (3)	The award of this mark depends on the award of B2 or B1 in (a) Allow as a misinterpretation, e.g. 'takes the same time cutting grass twice as long', 'the original 3 people will take 12 days to mow twice as long grass verge'
29.(a) 600 (people) and (£) 80	B1	
29.(b) Line of best fit	B1	Following trend with points above and below Do not allow a line through (0, 0)
29.(c)(i) Answer in the range 　　　　　(£)100 to (£)160	B1	FT 'their line of best fit'
29.(c)(ii) Reason, e.g. 'might be cold', 'depends on the weather', 'no data around 50 people to use', 'extending the line assumes the trend follows a straight line', 'no evidence to support less than 230 people', 'the line wouldn't pass through 0 people, £0'	E1	Allow, e.g. 'not as many people, so they may not stay long and not buy ice cream', ' if 50 people went, spend of approximately £100 (or more) would be unreasonable', 'not enough data'

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29.(d) Answer in the range £0.65 to £1.20 or 65p to 120p **with** correct unit given	B1 (5)	Do not accept in correct units, e.g. 0.87p Allow, e.g. £0.87p
30. $2x^2 - 7x - 15$	B2 (2)	B1 for $2x^2 - 10x + 3x - 15$ or B1 for FT correct collection of like terms provided at least 3 of the 4 terms are correct If no marks, award SC1 for answers of $2x^2 - 13x - 15$ or $2x^2 + 13x - 15$
31. Diagram or listing to show all the possible outcomes. e.g. <table><tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>1</td><td><i>11</i></td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>2</td><td>21</td><td><i>22</i></td><td>23</td><td>24</td><td>25</td></tr><tr><td>3</td><td>31</td><td>32</td><td><i>33</i></td><td>34</td><td>34</td></tr><tr><td>4</td><td>41</td><td>42</td><td>43</td><td><i>44</i></td><td>45</td></tr><tr><td>5</td><td>51</td><td>52</td><td>53</td><td>54</td><td><i>55</i></td></tr><tr><td>6</td><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td></tr></table> = $^5/_{30}$ (= $^1/_6$)	M2 A1 (3)	M1 for identifying 11, 22, 33, 44, 55. M1 for identifying that there are 30 possible outcomes. CAO <u>*Alternative MS*</u>: *Probability of both landing on the same particular number = $^1/_5$ x $^1/_6$* M1 *Probability of both landing on any same number = 5 x $^1/_5$ x $^1/_6$* M1 *= $^5/_{30}$ (= $^1/_6$)* A1

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32.(a) 27 ÷ 1⅔ or equivalent full method	B2	Allow 1⅔ =1.66 or 1.67 for B2, but not 1⅔ = 1.6 Award B2 for sight of 4.5 m/s B1 for 27 ÷ 1 hour 40 minutes or 27 ÷ 100 Allow B1 for 27 ÷ 1.4(0) or 27 ÷ 1.6
16.2 (km per hour) **AND** states or implies target not achieved	B1	CAO, must be exactly 16.2 (km per hour) from sight of 27 ÷ 1⅔ Unsupported 16.2 (km per hour) **AND** states or implies target not achieved is awarded B2 only (as answer may have been rounded to 16.2 km per hour from incorrect use of time) If no marks, allow SC1 for the appropriate interpretation of 27 ÷ 'their time given in hours' correctly evaluated, allowing ⅓ hour written as 0.3 *Alternatives:* *(20 km/h means) 30 km in 1½ hours M1* *Attempts 14(:)20 + 1 ½ m1* *(Finish time would be) 15(:)50 **AND*** *(Didn't finish until 16:00 so) states or implies target not met A1* *OR* *(Time would be) 60 × 27/20 M1* *81(minutes) or 1 hour 21 minutes A1* *(Rosa would needed to have finished by 14:20 + 1 hr 21 minutes) 15(:)41 **AND** states or implies target not met (as she finished at 16:00) B1* *OR* *(Distance would be) 20 × 1⅔ M1* * 33⅓ (km) or 33.33(... km) A1* *(A0 for 33.3(km))* *(Rosa cycled) less than 33⅓ (km) (or 33.33...km) **AND** states or implies target not met B1* *(Use of 20 × 1⅔ as 20 × 1.6 is awarded M1 only)*
32.(b) Impact statement, e.g. 'meets target', 'beats target' **AND** sight of (27 ÷ 1.25) 21.6 (km per hour)	E2	For E2 FT use of 'their time in hours' – 25 minutes used correctly **with** appropriate impact statement E1 for sight of 21.6 (km per hour) If no marks, SC1 for FT attempt 27 ÷ 'their time – 25 minutes written incorrectly' **with** appropriate impact statement, e.g. time used in (a) is 1.4, uses 1.4 – 25 minutes in calculating average speed '27 ÷ 1.15 = 23.47... so meets target'
	(5)	

33. Mid-points 2, 6, 10, 14, 18	B1	
2×2+6×7+10×10+14×8+18×3 (=312)	M1	FT 'their midpoints' provided these are at the bounds or within the groups (4 + 42 + 100 + 112 + 54 = 312)
÷ 30	m1	
10.4(mm)	A1	
	(4)	