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# GCSE MARKING SCHEME

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**AUTUMN 2020**

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



## **INTRODUCTION**

This marking scheme was used by WJEC for the 2020 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.

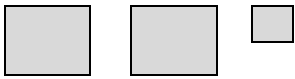
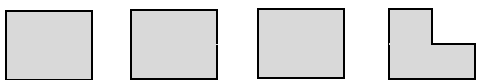
It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

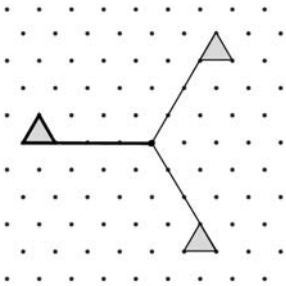
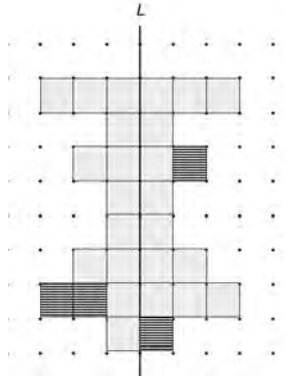
WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.



## EDUQAS GCSE MATHEMATICS

## AUTUMN 2020 MARK SCHEME

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
1. (a)(i) 600	B1	
(a)(ii) 24	B1	Not for $24 \times 4 = 96$ without indication that 24 is the answer but allow for $4 \overline{)96}^{24}$
1.(b) 0.03	B1	Must be a decimal point not a comma; do not allow 0.03%
1.(c) 0.35	B2	Allow equivalent correct values e.g. 35%; If 0.35 indicated as answer, ignore working B1 for $\frac{3}{20} = 0.15$ or for $\frac{1}{4} = 0.25$ or for $\frac{3}{10} = 0.3$ or for a comparative statement such as ' $\frac{3}{20}$ is less than $\frac{3}{10}$ ', or for two correct percentages from 15%, 35%, -30%, 25%, 3.1% and 30% or for two correct fractions with a common denominator
1.(d)  (24 ÷ 12) × 5 oe, si  10 CAO	M1  A1 (7)	Not for $\frac{5}{12} \times 24$ only; $\frac{10}{24}$ is M0; allow for $\frac{120}{12}$
2. (a) Lines drawn at 11 for May and 8 for Sept Correct pictogram diagrams for July e.g.  and August e.g.  and correct key: 4.	B3	Mark intent; must be lines not bars  B2 for any 3 or 4 correct or B1 for any 2 correct
2.(b) 57	B1	FT either diagram; for pictogram, key must be completed if FT
2.(c) August CAO	B1	Allow August and 15 (but not just 15 only)
	(5)	

<p>3.(a) Correctly completed shape: a single line in correct position a single line of correct length a triangle on the correct side of the line</p> 	<p>B2</p>	<p>B1 for a line in the correct position with either correct length or with a triangle on the correct side</p> <p>NB Allow unshaded triangle</p> <p>No line, no marks</p>						
<p>3.(b) Four correct squares shaded</p> 	<p>B2</p>	<p>B1 for a symmetrical shape with 4 correct squares and no more than 2 extra squares OR B1 for 3 or 4 correct squares and no more than 1 incorrect square OR B1 for 2 correct squares and no incorrect squares</p> <p>NB Allow unshaded squares</p>						
<p>(4)</p>								
<p>4.(a) Abby selected <b>and</b> evidence of all 3 correct totals seen as frequencies and/or tallies</p> <table border="1" data-bbox="178 1189 411 1290"> <tr> <td>Abby</td> <td>19</td> </tr> <tr> <td>Bea</td> <td>14</td> </tr> <tr> <td>Cherry</td> <td>17</td> </tr> </table>	Abby	19	Bea	14	Cherry	17	<p>B2</p>	<p>Frequencies may not be in the table; tallies and frequencies for total votes may not agree but frequencies take precedence for B2; allow for seeing e.g. 10, 8, 12 as frequencies for given tallies and then the correct tallies for the remaining list (which would together total 19, 14, 17 if added)</p> <p>B1 for three frequencies or tallies for total votes with one correct and a correct FT decision OR for two correct frequencies or tallies for total votes OR for three correct frequencies or tallies for total votes and an incorrect or no decision.</p>
Abby	19							
Bea	14							
Cherry	17							
<p>4.(b) <math>\frac{20}{50} (\times 100)</math> oe 40 (%)</p>	<p>M1 A1 (4)</p>	<p>Allow for <math>\frac{40}{100}</math></p>						



7.(a)(i) $4x - 9y$	B2	Mark final answer B1 for an expression either $4x + \dots$ or $\dots - 9y$ or for a correct answer seen then spoiled
7.(a)(ii) $7x + 9$	B2	Mark final answer B1 for sight of $7x + 14$ ; allow for e.g. $7x + 14 - 35$ or for a correct answer seen then spoiled
7.(a)(iii) $10x^2$	B2	B1 for either $10x^k$ where $k \neq 2$ or 0 OR $kx^2$ where $k$ could be any value other than 0 or 1 e.g. allow for $\frac{20x^2}{2}$ or $20x^2 \div 2$
7.(b)(i) $w - 15$	B1	Allow for e.g. $w - 15 = x$ ml; ignore any units Do not allow for $w - 15 = -15w$ or $w - 15 = 45$ or $w - 15 = w$ etc
7.(b)(ii) $\frac{r}{2}$ or $\frac{1}{2}r$ or $0.5r$	B1	Allow $r \div 2$ or $\frac{1 \times r}{2}$ or $r \times \frac{1}{2}$ e.g. $r \div 2 = x$ or $\frac{r}{2}$ bird boxes ; do not allow $\frac{r \text{ bird boxes}}{2}$ or $r \div 2 = r$ or $r : 2$
	(8)	
8.(a)(i) 4.3	B1	
8.(a)(ii) 11	B1	
8.(b)(i) (2, 9) (0.5, 3) (-1, -3) (1, 5)	B3	B2 for any three points correct or B1 for any two points correct
8.(b)(ii) 4 correctly plotted points	B2	STRICT FT for plotting 'their coordinates' from (b)(i)' for B2 or for B1  B1 FT for any 2 or 3 correctly plotted points  Mark intent, especially with decimal coordinates If more than 4 points are plotted, mark the worst 4 points
Correct line drawn at least through the 4 correct points (-1, -3) (0.5, 3) (1, 5) (2, 9)	B1	CAO  NB If no points plotted but correct line drawn, allow B0 B1 B1 B1 is possible for the <b>correct</b> line drawn accurately through 2 or 3 correct plots only Maximum of 2 marks out of 3 if the coordinates and line are not both fully correct
	(8)	

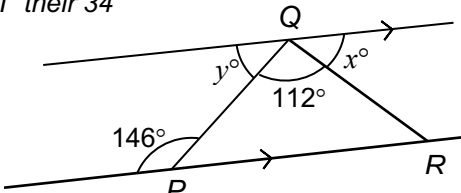




11.(a) ( $x =$ ) 24	B1	Allow embedded
11.(b) $5x = 15$ ( $x =$ ) 3	B1 B1	FT from $5x = k$ . Accept $\frac{k}{5}$ , but if on FT $k$ is a multiple of 5, final answer must be given as a whole number.  Mark final answer.  Allow 2 marks for an embedded answer BUT only 1 mark if contradicted by $x \neq 3$ ; condone poorly expressed embedded answers such as $5 \times 3 = 15 - 8 = 7$ for B2
	(3)	
12.(a) 10 : 3	B2	Mark final answer B1 for any correct <b>simplified</b> ratio not in simplest form e.g. 40 : 12; may be in working space  If no marks, award SC1 for a final answer 3 : 10
12.(b) 152 CAO	B2	Mark final answer B1 for $19 \times (24 \div 3)$ oe, si or for finding 152 : 24 from 19 : 3 or for 152 seen and then spoiled by e.g. adding or subtracting 80 or 24  If no marks, award SC1 for final answer 72
12.(c) $\frac{820}{10} \times 7$ or $82 \times 7$ or $\frac{820}{100} \times 170 - 820$ oe si  (£) 574 (.00) CAO	M1  A1	May be seen in stages; allow even if answer then spoiled by e.g. being added to or subtracted from 820  Mark final answer If no marks award SC1 for final answer 1394
	(6)	

<p>13. (a) Correct frequency diagram</p>	<p>B2</p>	<p>May be a bar chart or frequency polygon. For frequency polygon, ignore points to the left of (35, 12) and to the right of (75, 29)</p> <p>B1 for a bar chart attempt, 3 or 4 bars correct; no gaps NB heights are 12, 65, 74, 55, 29</p> <p>or, for a frequency polygon attempt, 3 or 4 points plotted correctly and joined; mark intent to join points NB (35, 12) (45, 65) (55, 74) (65, 55) (75, 29)</p> <p>Allow good freehand</p>
<p>13.(b) <math>\frac{60}{240}</math> oe, ISW</p>	<p>B2</p>	<p>Allow e.g. <math>\frac{1}{4}</math>, 0.25 or 25% but not 1 : 4</p> <p>B1 for 5 + 40 + 60 + 75 + 60 or 240 seen or for 60 as the numerator in a fraction less than 1</p>
<p>13.(c) Correct comparison e.g. 'In 2019 a greater percentage of plastic was recycled as there were fewer people in the 30 – 40 category in 2019 than in 2018.'</p> <p>or 'In 2019 the modal class is 60 to 70 whereas in 2018 it is only 50 to 60.'</p> <p>or 'In 2019 more people recycled more than 70% of their plastic than in 2018.'</p>	<p>E1</p>	<p>Must be a comparison Allow e.g. 'The bars are taller to the right in 2019.' or 'The mode was lower in 2018.' or 'More people are recycling more plastic.' or 'More plastic is recycled in 2019' or 'It has increased.' or 'The amount recycled by the members has increased in the past year.'</p> <p>Do not allow e.g. 'It has increased as they have more members.' or 'The percentage of <b>people</b> recycling plastic has gone up.' or 'The amount of <b>people</b> recycling has increased.' or or 'The plastic recycled goes up throughout 2019 whereas in 2018 it went up at the start of the year, then down.'</p>
<p>(5)</p>		



<p>14.(b)(i) Complete correct method to find <math>x</math>, e.g. <math>146 - 112</math> (alternate angles are equal)</p> <p>OR (<math>QPR =</math>) <math>180 - 146 (= 34)</math> (angles on a straight line) and (<math>QRP =</math>) <math>180 - 112 - 34 (= 34)</math> (angles in a triangle)</p> <p><math>34^\circ</math> (alternate angles are equal)</p> <p>An appropriate reason linked to an angle</p>		<p>Angles may be marked on the diagram</p> <p>M1 FT 'their 34' for the second angle M0 for use of <math>180 - 112 = 68</math>, <math>68 \div 2 = 34</math></p> <p>A1 CAO; <math>34^\circ</math> only is M0 A0</p> <p>E1 (one reason only is sufficient for this mark)</p>
<p><b>Alternative method:</b> <math>y = 180 - 146</math> (allied angles) and <math>180 - 112 - 34</math> (angles on a straight line)</p> <p><math>34^\circ</math></p> <p>An appropriate reason linked to an angle</p>		<p>Angles may be marked on the diagram</p> <p>M1 FT 'their 34'</p>  <p>M0 for use of <math>180 - 112 = 68</math>, <math>68 \div 2 = 34</math></p> <p>A1 CAO; <math>34^\circ</math> only is M0 A0</p> <p>E1 (one reason only is sufficient for this mark) Allow 'interior angles' or 'co-interior angles'</p>
<p>14.(b)(ii) Correct name and reason</p>		<p>B1 FT 'their (i)'; answer <b>must</b> be consistent with their values from part (i) EXCEPT allow a restart with correct calculations to show equal base angles</p> <p>If (i) correct 'Isosceles' and equal base angles or two equal angles oe stated or shown; may be seen in (i) e.g. on the diagram</p> <p>If (i) incorrect 'Scalene' and no equal angles oe stated or shown; may be seen in (i) e.g. on the diagram</p> <p>Reason referencing sides only is not sufficient; condone poor spelling if intention is clear</p>
(6)		
<p>15.(a) (<math>245 - 230 =</math>) 15</p>		<p>B1</p>
<p>15.(b)(i) Joe indicated and valid explanation based on sample size e.g. 'A bigger sample should give more reliable results.'</p>		<p>E1 Allow for Joe indicated and 'It would give a bigger sample.' or 'It uses all the data.' or 'Joe's method uses both sets of data' or 'The higher the number you have the more likely you will get a more accurate result' or 'Meera's method would use a smaller sample.' or 'Meera would not be using all the data.' or 'Joe adds them together.' or 'Joe uses the total number (of plants).'</p> <p>Do not allow e.g. 'It is the average.' or 'It would be more accurate.' or 'It would be better' or 'It would be more reliable.'</p> <p>NB Meera indicated scores E0</p>
<p>15.(b)(ii) (<math>60 + 70</math>) <math>\times 40 \div 2</math> oe 2600</p>		<p>M1 <math>130 \times 20</math></p> <p>A1 If no marks award SC1 for (<math>60 + 70</math>) <math>\div 2</math> oe</p>
(4)		

<p>16.</p> <p><math>100 \times 110 \times 80</math></p> <p>880 000 (cm<sup>3</sup>) si</p> <p><math>(100 \times 110 \times 80) \div 1000</math> si</p> <p style="text-align: right;"><math>\div 20</math> si</p> <p>44 (minutes)</p> <p>12 (: ) 34</p>	<p>M1</p> <p>A1</p> <p>m1</p> <p>m1</p> <p>A1</p> <p>B1</p>	<p>May be in stages; <math>100 + 110 + 80</math> is M0 m0 m0 but could possibly earn B1FT</p> <p>CAO</p> <p>FT 'their evaluation of <math>100 \times 110 \times 80</math>'; can be implied by sight of e.g. 880 (litres)</p> <p>FT 'their evaluation of <math>100 \times 110 \times 80</math>' NB <math>880\,000 \div 20\,000</math> would earn m2; divisions can be done in either order</p> <p>FT 'their 880 000' <math>\div 20\,000</math> provided all method marks awarded and not from wrong working</p> <p>FT 11:50 plus 'their derived 44 minutes' which must be seen, providing 'their 44 minutes' is more than 10 minutes; ignore 'am' or 'pm'</p>
(6)		
<p>17.</p> <p><math>\frac{5}{7} - \dots = \frac{2}{21}</math> si or for sight of <math>\frac{15}{21}</math> or for</p> <p><math>\frac{5}{7} - \frac{2}{21}</math> or for <math>\frac{2}{21} - \frac{5}{7}</math></p> <p><math>\frac{13}{21}</math> oe, ISW</p>	<p>B1</p> <p>B2</p>	<p>Allow for sight of e.g. <math>\left(\frac{15}{21} = \right) \frac{105}{147}</math> and <math>\left(\frac{2}{21} = \right) \frac{14}{147}</math></p> <p>B1 for <math>\frac{15}{21} - \frac{2}{21}</math> oe; this also implies the first B1</p>
(3)		
<p>18.*(a)</p> <p>Valid error comment e.g. 'The vertical scale from 1 to 174 is missing.'</p>	<p>E1</p>	<p>Accept an indication on the graph e.g. the scale break circled or a comment such as 'it is not accurately drawn especially next to the 0'.</p> <p>Do not allow e.g. 'The points have been connected' or 'Part of the scale is missing' (without further comment e.g. part of the vertical scale would be ok)</p> <p>Ignore embellishments to a correct statement provided they are not contradictory</p>
<p>18.(b)</p> <p>Valid impact comment e.g. 'It looks like there is a peak time at 10 am (when there is not).' or 'It makes the difference (at 10am) look greater.'</p>	<p>E1</p>	<p>They may have included some information in (a) to support their answer here, take the two parts together for this part if necessary and not contradictory but must have attempted an answer for (b)</p> <p>Allow e.g. 'They might not look at the y axis to see how small the difference really is.'</p> <p>Do not allow e.g. 'People will think there are less cars, like 2 instead of 176'.</p>
(2)		

19.*(a) $\frac{7}{12}$	B1	Allow for any equivalent fraction e.g. $\frac{84}{144}$
19.(b) $\frac{300}{12} \times 2$ oe 50 (ml)	M1 A1 (3)	FT 'their 2 + 3 + 7' from part (a); allow recovery of 12 here even if a different denominator in (a) FT $600 \div (\text{their } 2 + 3 + 7)$
20.*(a) 2	B1	
20.(b) $\pi \times 6^2 - \pi \times 5^2$ or $36\pi - 25\pi$ si  11 $\pi$	M2 A1	For M2 or M1, $\pi$ could be 3.14 or better or $\frac{22}{7}$ etc M1 for sight of $\pi \times 6^2$ or $\pi \times 5^2$ oe Mark final answer; not from wrong working; allow $\pi \times 11$ or $11 \times \pi$ but do not allow $\pi 11$  If no marks, award SC1 for an answer of $44\pi$ or $\pi \times 44$ or $44 \times \pi$ (from $\pi \times 12^2 - \pi \times 10^2$ )
	4	
21.* (Total Force =) 54 (newtons) si  (Total area = $3 \times 6$ =) 18 (cm <sup>2</sup> ) si  (Pressure =) $54 \div 18$  3 (N/cm <sup>2</sup> )	B1 B2 M1 A1	B1 for $3 \times 2 \times 3$ or 6(cm <sup>2</sup> ) si or for sight of 'their area of one foot' $\times 3$ May be seen in stages e.g. $54 \div 3 \div 6$ FT 'their 54' and 'their 18', providing at least $34 + 20$ and $3 \times 2 \times 3$ attempted  NB $54 \div 6 \div 3$ also implies B2 (Common answer $54 \div 6 = 9$ earns B1 B1 M0 A0, 2 marks)
	(5)	

<p>22.*</p> <p>Attempts to find a common factor of at least two of 140, 56 and 280</p> <p>Finds at least one common factor, greater than 1, of all three numbers</p> <p>28 (bags)</p> <p>Uses a common factor that is greater than 4 to find the number of each item</p>	<p>S1</p> <p>M1</p> <p>A1</p> <p>M1</p>	<p>Mark whichever method is to the candidate's advantage</p> <p>Allow slips if the intention is clear. e.g. May list some of the factors of e.g. both 140 and 56 or 280, or all list factors of all 3 values</p> <p>or calculations, using factors, such as  <math>140 \div 14 = \dots</math> <b>and</b> <math>56 \div 14 = \dots</math> or  <math>28 \times 5 = 140</math> <b>and</b> <math>28 \times 2 = 56</math> or  <math>280 \div 56 = 5</math> or  <math>280 \div 140 = 2</math></p> <p>or attempt to find the prime factorisation of two of the numbers  <math>140 = 2^2 \times 5 \times 7</math>, <math>56 = 2^3 \times 7</math>, <math>280 = 2^3 \times 5 \times 7</math></p> <p>or draw a Venn diagram with the prime factors of any two numbers correctly positioned</p> <p>2, 4, 7, 14, 28; may be embedded in calculations e.g. <math>28 \times 5 = 140</math>, <math>28 \times 2 = 56</math>, <math>28 \times 10 = 280</math></p> <p>CAO</p> <p>NB  7: 20, 8, 40  14: 10, 4, 20</p>
<p>5 (vouchers), 2 (pencils), 10 (sweets)</p> <p><b>Alternative method:</b>  Forms the ratio 140 : 56 : 280 and attempts to simplify</p> <p>Finds a simplified form of 140 : 56 : 280</p> <p>(5 : 2 : 10 therefore)  5 (vouchers), 2 (pencils), 10 (sweets)</p> <p>Finds <math>140 \div 5</math> or <math>56 \div 2</math> or <math>280 \div 10</math></p> <p>28 (bags)</p>	<p>A1</p> <p>S1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>(5)</p>	<p>CAO</p> <p>Values in ratio could be in any order. e.g. finds a simplified form with 2 values correct</p> <p>e.g. 70 : 28 : 140</p> <p>CAO</p> <p>FT 20: 8: 40 or 10: 4: 20 only; may be in stages</p> <p>CAO</p>



23.* $y = k - 4x$ with $k \neq 12$	B1	Accept the equation of a different parallel line in any form e.g. $2y = -8x$
	(1)	
24. $x(3x - 4y)$	B1	Allow closing bracket to be omitted; do not ISW if they go on to 'simplify' further
	(1)	
25.(a) $11\sqrt{5}$	B1	Mark final answer
25.(b) 64	B2	Not from wrong working B1 for $4^3$ or $4 \times 4 \times 4$ or $4^{10+(-7)}$ oe, si
	(3)	NB e.g. $4^3 \times 4^3$ is B0
26.*(a)(i) Valid explanation e.g. 'There is no value for which $0 \times \dots = 1$ ' or '1 cannot be divided by 0' or 'Because if one of them is zero, the product would be zero not 1'.	E1	Allow e.g. ' $x = \frac{1}{y}$ , $y = \frac{1}{x}$ if x or y can be zero these have no value'  Do not allow e.g. 'Because then the value could not be 1' without further explanation
26.(a)(ii) Correct graph: One branch in 1st quadrant, not touching either axis and correct shape One branch in 3rd quadrant, not touching either axis and correct shape	B2	For 2 marks, must be 2 distinct curves; allow some slight curving back at ends B1 for either branch correct  If no marks, SC1 for both branches correct but joined e.g. with a straight line.
26.(a)(iii) inversely	B1	allow poor spelling; allow 'inverse' or 'not directly' or 'not in direct' or 'not direct' or 'not' or 'indirectly'  Do not allow e.g. 'invertional' or 'inversamental'
26.(b) $5 \times 0.1^2$ oe, si	M1	Substitutes and rearranges; may be in stages; implied by e.g. $\frac{V}{0.1^2} = 5$ , $\frac{V}{0.2} = 5$ , $V = 5 \times 0.2$ (must be clear that '0.2' is what they think is $0.1^2$ )
0.05 oe	A1	Implies M1
	(6)	

<p>27.</p> <p><math>3s + 2p = 30</math> and <math>2s + 4p = 40</math></p> <p>Method to eliminate an unknown equal coefficients and subtraction or rearranges one equation and substitutes into the other e.g.</p> <p>Finds one unknown</p> <p>Finds the other unknown</p> <p>(£)2.5(0)</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>A1</p> <p>B1</p> <p>(5)</p>	<p>May use other letters or words throughout this part</p> <p>Allow for e.g.  <math>3s + 2p = £30</math> and <math>2s + 4p = £40</math> or  <math>3\text{stand} + 2\text{prem} = 30</math> and <math>2\text{stand} + 4\text{prem} = 40</math>  etc;  must be equations with + and = and consistent letters or words</p> <p>FT 'their equations' provided one is correct and the other is linear in the same pair of unknowns</p> <p>Allow one error in one term but, if using equal coefficients, not in the equated coefficients</p> <p>CAO; <math>s = 5</math> or <math>p = 7.5(0)</math></p> <p>FT 'their derived <math>s</math>' or 'their derived <math>p</math>' used in one of their equations</p> <p>If B0 M0 award SC3 for <math>s = 5</math> and <math>p = 7.5(0)</math> found using trials or inspection; must check that values found fit <b>all</b> the data</p> <p>If B1 M0 award SC3 for <math>s = 5</math> and <math>p = 7.5(0)</math> found using trials or inspection on correct equations; must check that values found fit <b>all</b> the data</p> <p>FT 'their derived <math>p</math>' – 'their derived <math>s</math>' provided at least one of the previous four marks awarded</p> <p>Allow <math>-(£)2.5(0)</math></p>
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