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# **GCSE MARKING SCHEME**

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**SUMMER 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) 7	B1	
(b)(i) $\frac{1}{100}$ or equivalent	B1	
(ii) 0.01	B1	0.01% is B0
(c) (32 ÷ 10) ÷ 2 or equivalent	M1	May be in steps
1.6	A1	Allow e.g. 1.60
(d) $\frac{3}{10}, \frac{3}{7}, \frac{3}{5}$	B1	
(e) 109.8	B1	Allow trailing zeros
	(7)	
2.(a)(i) cuboid	B1	Do not accept rectangular prism or square based prism
(a)(ii) 8	B1	
(b) cone indicated	B1	
	(3)	
3.(a) (£) 6.50 + 4.29 + (2.10 ÷ 2) or (£) 6.50 + 4.29 + 2.10 – 1.05 or equivalent	M2	M1 for 2.10 ÷ 2 or equivalent or for sight of 1.05 or equivalent or for 6.50 + 4.29 + 2.10 or for sight of 12.89
(£)11.84 or 1184(p) CAO	A1	Allow £11.84p Do not allow 11.84p or £1184
(b) (£) 20 – (11.84 + 2.75) or equivalent	M1	FT 'their 11.84', provided it is less than 17.25
(£) 5.41 or 541(p)	A1	FT Allow £5.41p Do not allow 5.41p or £541
	(5)	

4.(a) 11:01	B1	Any clear notation; may be identified in table																								
(b) Attempts to find 11:25 – 10:32  53 (minutes)	M1  A1	May be in steps; allow for sight of 28 and 25 (minutes) If M0 then SC1 for an answer of 44 mins (from summing the 2 train journeys)																								
(c)(i) <table border="1" data-bbox="347 405 555 663"> <tbody> <tr><td>S</td><td>A</td><td>T</td></tr> <tr><td>S</td><td>A</td><td>C</td></tr> <tr><td>S</td><td>B</td><td>T</td></tr> <tr><td>S</td><td>B</td><td>C</td></tr> <tr><td>P</td><td>A</td><td>T</td></tr> <tr><td>P</td><td>A</td><td>C</td></tr> <tr><td>P</td><td>B</td><td>T</td></tr> <tr><td>P</td><td>B</td><td>C</td></tr> </tbody> </table>	S	A	T	S	A	C	S	B	T	S	B	C	P	A	T	P	A	C	P	B	T	P	B	C	B2	Allow either of the first two rows to be repeated for B2  B1 for any 4 or 5 correct rows, ignoring any repeated rows  NB order of letters may be different
S	A	T																								
S	A	C																								
S	B	T																								
S	B	C																								
P	A	T																								
P	A	C																								
P	B	T																								
P	B	C																								
(c)(ii) $\frac{2}{8}$ or equivalent; ISW	B1	CAO; do not allow 2 : 8, but accept 25%																								
	(6)																									
5.(a) $9 \times 5 + 25$  (£) 70	M1  A1	Seen or implied																								
(b) $(225 - 25) \div 5$  40	M1  A1	Seen or implied  Allow 2 marks for an embedded answer e.g. $225 = 40 \times 5 + 25$ ;																								
	(4)																									
6.(a) $(\frac{25}{100} \times 50 = \text{£}) 12.5(0)$  (Shot on Goal = £) 62.5(0)  Sight of (£) 59.99 and correct choice	B1  B1  B1	FT 'their $\frac{25}{100} \times 50$ '; implies the first B1  Correct choice FT 'their (£) 62.50'  Correct choice e.g. 'Shirts Glorious Shirts' may be implied;  Allow sight of (£) 60 (.00) and correct choice																								
(b) $276 \div 12$  (£) 23(.00)	M1  A1	seen or implied; implied by e.g. repeated subtraction or $12 \times 23 = 276$																								
	(5)																									

7.(a) 200 (cm) or 2 m(etres)	B1	ISW
(b) No stated or implied with valid reason e.g. '3 : 75 is 1 : 25 (not 1 : 50).' or '3cm is 150 cm (not 75 cm).' or 'It should have been 1.5 cm'	E1	Allow e.g. 'No, he needs to divide 75 by 50 to get the size of the model's door.' or 'No it is twice as wide as it should be.' or ' $3 \times 25 = 75$ ' or ' $3 \times 50 = 150$ '
(c) $250 \div 50$ or $2.5 \div 50$	M1	For division by 50 Allow e.g. $2 \text{ m } 50 \text{ cm} \div 50$ or for $50 \times 5 = 250$
5 (cm)	A1	CAO
	(4)	
8. 0.8 or equivalent	B1	
	(1)	
9.(a) Any percentage between $33\frac{1}{3}\%$ and 40(%) exclusive.	B1	
(b) Correct first step e.g. $48 \div 3 = 16$ or $2 \times 48 = 96$ or $48 \div 4 = 12$ or $\frac{1}{2} \times \frac{1}{3} \times 48$	B1	
Correct second step e.g. $16 \times 2 = 32$ or $96 \div 3 = 32$ or $12 \times 2 = 24$ or $12 \div 3 = 4$	B1	FT their first step Implies the first B1.
8	B1	FT
	(4)	

<p>10.  <math>2 \times 2000</math> or <math>1990 + 1800</math> or <math>2000 + 1800</math>  or <math>2000 + 1900</math> or equivalent</p> <p>Attempts to calculate e.g.  <math>2 \times 2000 + 3000 (= 7000)</math> or  <math>1990 + 1800 + 3000 (= 6790)</math> or  <math>2000 + 1800 + 3000 (= 6800)</math>  <math>2000 + 1900 + 3000 (= 6900)</math> or  <math>1986 + 1834 + 3000 (= 6820)</math> or equivalent  or  <math>7000 - 2 \times 2000 (= 3000)</math> or  <math>7000 - 1990 - 1800 (= 3210)</math> or  <math>7000 - 2000 - 1800 (= 3200)</math>  <math>7000 - 2000 - 1900 (= 3100)</math>  <math>7000 - 1986 - 1834 (= 3180)</math></p> <p>Evaluates correctly</p> <p>Yes stated or implied  following a correctly-evaluated, valid  calculation and  with evidence of an appropriate correct  conversion from grams to kilograms or  kilograms to grams seen or implied at  some stage</p> <p>e.g. <math>1986 \text{ (g)} \approx 2 \text{ (kg)}</math> or <math>1834 \text{ (g)} \approx 1.8 \text{ (kg)}</math>  <math>7000 \text{ (g)} = 7 \text{ (kg)}</math> or <math>6790 \text{ (g)} = 6.79 \text{ (kg)}</math>  or <math>6900 \text{ (g)} = 6.9 \text{ (kg)}</math></p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>A1</p> <p>(4)</p>	<p>Allow any reasonable calculation with at least one correctly rounded value and no incorrect rounding in each case.  NB1 the question requires a calculation so sight of 2000 and 1800 followed by a total of 3800 without the + seen is B0</p> <p>NB2 It is acceptable to round up in both cases because of the context of the question.</p> <p><u>Ignore consistent place value errors from converting to kg for M1 A1</u></p> <p>'their estimate for the total mass' + 3000 or 'the actual total mass + 3000';  or  7000 – 'their estimate for the total mass' or 7000 – 'the actual total mass'</p> <p>Accept all masses in kilograms</p> <p>Allow <math>7000 - 3000 (= 4000)</math> with sight of the total mass of the rabbits</p> <p>FT their sum or difference of masses; implies M1</p> <p>Dep on previous M1 A1</p> <p>Conversion may be implied by e.g. 6800 g is less than 7 kg or by <math>4000 + 3000 = 7000</math> g so yes but NOT by e.g. 6800 is less than 7 or <math>4000 + 3000 = 7000</math></p> <p>Allow further rounding when grams converted to kg e.g. <math>6900 \text{ (grams)} = 7 \text{ kg}</math></p> <p>NB Sight of 1000 g = 1 kg only, is not sufficient to earn the mark. The conversion must be for a mass relating to the context of the question.</p>
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<p>11.</p> <p>Sight of 8 (coins in the purse)</p> <p>Sight of (value of coins is) (£)10</p> <p>Sight of (greatest and least values are) £2 and 50p</p> <p>Correct solution:</p> <table border="1" data-bbox="193 533 707 577"> <tr> <td>£2</td><td>£2</td><td>£2</td><td>£1</td><td>£1</td><td>£1</td><td>50p</td><td>50p</td> </tr> </table> <p>OR</p> <table border="1" data-bbox="193 611 707 656"> <tr> <td>£2</td><td>£2</td><td>£2</td><td>£2</td><td>50p</td><td>50p</td><td>50p</td><td>50p</td> </tr> </table>	£2	£2	£2	£1	£1	£1	50p	50p	£2	£2	£2	£2	50p	50p	50p	50p	<p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p>	<p>Check teacher's comment for values.</p> <p>Not just for these in a list of coins, they must be identified in some way as the 2 coins that are 'one 4 times the other' e.g. they may be the only coins stated or they may be circled in a list etc</p> <p>CAO</p>
£2	£2	£2	£1	£1	£1	50p	50p											
£2	£2	£2	£2	50p	50p	50p	50p											
(4)																		
<p>12.(a)(i)</p> <p>55</p>	<p>B1</p>																	
<p>(a)(ii)</p> <p>-1</p>	<p>B1</p>																	
<p>(a)(iii)</p> <p>3</p>	<p>B1</p>	<p>Allow embedded answer</p>																
<p>(b)</p> <p>Square root or equivalent</p>	<p>B1</p>																	
(4)																		

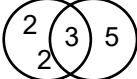
<p>13. (a)          Indication of bearing <math>135^\circ \pm 2^\circ</math> from <i>L</i>          Indication of bearing <math>064^\circ \pm 2^\circ</math> from <i>P</i>          Position of the boat marked</p>	<p>B1          B1          B1</p>	<p>Position may be implied by intersection of straight lines for bearings</p>
<p>13. (b)(i)  <math>6 \times 10 \div 5</math></p> <p>12 (litres)</p>	<p>M2</p> <p>A1</p>	<p>Or equivalent full method</p> <p>STRICT FT 'their position of the boat', so 'their <math>6 \times 10 \div 5</math>'          Tolerance <math>\pm 2</math> mm</p> <p>M1 for          'their 6' in cm <math>\times 10</math> or 'their 6' in mm <math>\times 10 \div 5</math></p> <p>FT; must follow correct use of 'their 6' in cm</p> <p>If there is no 'position of the boat' marked in (a) allow SC2 for 'a number of litres' correctly found from 'a length in cm' <math>\times 10 \div 5</math> or SC1 for 'a length in cm' <math>\times 10 \div 5</math></p>
<p>(b)(ii)          Valid assumption about the conditions or straight line of the journey e.g.          'The conditions were normal so the boat travelled 5km per litre.' or 'The weather was normal.' or 'The sea was normal.' or 'The weather conditions were unusually good.' or 'The boat travelled in a straight line to H.'</p> <p>Valid impact based on their assumption e.g. 'The boat would use more fuel.' or 'The boat would use less fuel.' or 'The amount of fuel used to travel 5 km would be different, so the total amount needed would be different.'</p>	<p>E1</p> <p>E1</p>	
	<p>(8)</p>	

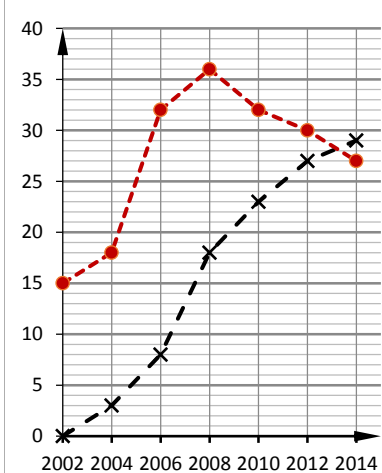


<p>14.(a)  <math>x + 2x + 5x (= 8x)</math></p> <p>320 ÷ 8 seen or implied</p> <p>(<math>x =</math>) 40 seen or implied</p> <p><math>40 \times 6 + 2 \times 40 \times 5 + 5 \times 40 \times 10</math>  <math>(40 \times 6 + 80 \times 5 + 200 \times 10 =</math>  <math>240 + 400 + 2000)</math></p> <p>(£) 2640</p>	<p>M1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>Allow for sight of <math>1 + 2 + 5 (= 8)</math> or  <math>1 : 2 : 5</math> or equivalent  or for 3 numbers of bulbs in the ratio <math>1 : 2 : 5</math> or  for sight of <math>x, 2x, 5x</math></p> <p>FT 'their <math>1 + 2 + 5</math>';  may be implied by trials leading to e.g.  <math>40 : 80 : 200</math></p> <p>CAO  May be implied in later working.</p> <p>FT 'their derived <math>x</math>'  May be seen in stages.</p> <p>FT 'their derived <math>x</math>' × 66</p>
<p>(b)(i)  <math>25 + \frac{25}{5} \times 3 (= 25 + 15)</math> or <math>\frac{25}{5} \times 8 (= 5 \times 8)</math></p> <p>40 (hours)</p>	<p>M1</p> <p>A1</p>	<p>If no marks awarded, allow SC1 for sight of 15 (hours)</p>
<p>(b)(ii)  <math>156 \div 15</math></p> <p>(£) 10.4(0)</p>	<p>M1</p> <p>A1</p>	<p>FT 'their <math>(40 - 25)</math>', provided 'their <math>15 \geq 11</math></p> <p>FT ; any FT values must be rounded or truncated to 2 dp</p>
<p>(b)(iii)  <math>\frac{175}{25} - 1</math> or <math>\frac{175 - 25}{25}</math></p> <p>(£) 6</p>	<p>M1</p> <p>A1</p> <p>(11)</p>	<p>May be in steps</p>

<p>15. (a)</p> $\frac{46}{2} \times 7 \text{ or equivalent}$ <p>161 (pupils)</p>	<p>M1</p> <p>A1</p>	<p>May be in steps.</p>
<p>(b)</p> <p>A correct sum or difference e.g.</p> $\frac{5}{8} + \frac{3}{40} \text{ or } \frac{7}{10} - \frac{3}{40} \text{ or } \frac{7}{10} - \frac{5}{8}$ <p>or equivalent</p> <p>Sight of two fractions with a common denominator equivalent to any two of</p> $\frac{5}{8}, \frac{7}{10}, \frac{3}{40}$ <p>Yes with a correctly evaluated sum or difference appropriately simplified</p> <p>or</p> <p>Yes following sight of <math>\frac{25}{40}, \frac{28}{40}</math> or a pair of equivalent fractions</p>	<p>B1</p> <p>B1</p> <p>E1</p>	<p>May be earned later.</p> <p>e.g. <math>\frac{25}{40}, \frac{28}{40}</math> or <math>\frac{50}{80}, \frac{56}{80}</math>;</p> <p>May be in a sum or difference</p> <p>e.g. <math>\frac{25}{40} + \frac{3}{40}</math> or <math>\frac{28}{40} - \frac{3}{40}</math> or <math>\frac{28}{40} - \frac{25}{40}</math></p> <p>Allow any correct common denominator; may imply previous B1</p> <p>From a sum or difference, e.g.</p> $\left( \frac{25}{40} + \frac{3}{40} = \right) \frac{28}{40} = \frac{7}{10} \text{ or}$ $\left( \frac{28}{40} - \frac{3}{40} = \right) \frac{25}{40} = \frac{5}{8} \text{ or}$ $\left( \frac{56}{80} - \frac{50}{80} = \right) \frac{6}{80} = \frac{3}{40}$ <p>if no sum or difference stated then maximum 2 marks (B0 B1 E1)</p>
		<p><b>Alternative method:</b> (or equivalent in percentages)</p> $0.7 - 0.625$ <p style="text-align: right;">B1</p> $= 0.075$ <p style="text-align: right;">B1</p> <p>Yes with <math>\frac{75}{1000} = \frac{3}{40}</math></p> <p style="text-align: right;">E1</p>
	(5)	
<p>16.</p> $(1700 +) \frac{1700}{100} \times 3 \times 4$ <p>No and comparison of 204 with 300 or 1904 with 2000.</p>	<p>M2</p> <p>A1</p>	<p>M1 for <math>\frac{1700}{100} \times 3 (= 51)</math></p> <p>Allow 'No she does not have enough' (after e.g. 1904 found)</p> <p>Allow 'Yes' with 1904 'as the £2000 was only an estimate'</p>
	(3)	

<p>17.</p> <p>Angle <math>AEF</math> or Angle <math>DEB = 93^\circ</math> (Angles on a straight line (sum to 180))</p> <p>Angle <math>AFE = 54^\circ</math> (Corresponding angles (are equal)) or Angle <math>ABC = 93^\circ</math> (Corresponding angles (are equal) or alternate angles (are equal))</p> <p><math>(x = ) 180^\circ - 93^\circ - 54^\circ = 33^\circ</math> (Angles in a triangle (sum to 180))</p> <p>A correct reason linked to a correct statement</p>	<p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>(4)</p>	<p>Answers may be seen on the diagram; it must be clear from description or reasoning which angles are being calculated or used</p> <p><b>Alternative method for first 2 marks:</b> Angle <math>BEF = 87^\circ</math> (Vertically opposite angles (are equal))</p> <p>Angle <math>ABC = 93^\circ</math> (Interior angles (sum to 180))</p> <p>or equivalent e.g. <math>93 + 33 + 54 = 180</math></p> <p><b>Alternative method 1:</b> Assuming <math>x = 33^\circ</math>:</p> <p>Angle <math>ABC = 180^\circ - 33^\circ - 54^\circ = 93^\circ</math> (Angles in a triangle (sum to 180)) B1</p> <p>Angle <math>AEF</math> or Angle <math>DEB = 93^\circ</math> (Angles on a straight line (sum to 180)) B1</p> <p>Angle <math>ABC =</math> Angle <math>AEF</math> (Corresponding angles (are equal)) or Angle <math>ABC =</math> Angle <math>DEB</math> or (Alternate angles (are equal)) B1</p> <p>A correct reason linked to a correct statement B1</p> <p><b>Alternative method 2:</b> Assuming <math>x = 33^\circ</math>:</p> <p>Angle <math>AFE = 54^\circ</math> (Corresponding angles (are equal)) B1</p> <p>Angle <math>AEF = 180^\circ - 33^\circ - 54^\circ = 93^\circ</math> (Angles in a triangle (sum to 180)) B1</p> <p><math>93 + 87 = 180</math> (Angles on a straight line (sum to 180)) B1</p> <p>A correct reason linked to a correct statement B1</p> <p><b>Alternative method 3:</b> Angle <math>AFE = 54^\circ</math> (Corresponding angles (are equal)) B1</p> <p><math>x + 54 = 87</math> (Exterior angle (is equal to the sum of the two opposite interior angles)) B1</p> <p><math>x = 87 - 54 = 33</math> B1</p> <p>A correct reason linked to a correct statement B1</p>
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18.(a) $\frac{8 \times 21}{2}$ or equivalent	M1	
84 (cm <sup>2</sup> )	A1	
(b) Valid explanation including 'perpendicular' or equivalent e.g. 'It is the perpendicular distance.' or 'Because the height makes a right angle with the base.'	E1	Allow e.g. 'Because it is at a right angle' or 'It's a perpendicular angle that splits directly through the middle.' or 'It is the height of the triangle'  Do not allow 'Because it goes straight down not diagonally which would be longer' or 'Because it is a vertical line not a sloping one'
	(3)	
19.(a) $\frac{4}{9}$ or an equivalent fraction	B1	
(b) 2 : 3 or equivalent	B1	
	(2)	
20. $m = 3$ and $n = 6$	B2	B1 for $m = 3$ or for $n = 2 \times$ 'their $m$ '
	(2)	
21. 1	B1	Clearly identified
	(1)	
22.* (soup = ) 5      (water = ) 4	B2	B1 for sight of $3 \times 4$ and $3 \times 5$ or equivalent or for (LCM =) 60 or for a correct Venn diagram of primes factors  or for 4 and 5 ( values reversed) or for answers of $5n$ and $4n$ where $n$ is an integer $> 1$
	(2)	

<p>23.*(a) Correct plot</p>	<p>P1</p>	<p>May or may not be joined</p> 
<p>(b)(i) 2004</p>	<p>B1</p>	
<p>(b)(ii) 2006 and 2008</p>	<p>B1</p>	
<p>(b)(iii) Any valid comparison. e.g. 'The composting percentage is always increasing but the recycling percentage increases (until 2008) but then decreases.' or 'From 2012 the recycling and composting rates are about the same.' or 'From 2002 to 2008 both rates are increasing but after 2008 the recycling rate decreases whereas the composting rate keeps on increasing.' or 'The recycling rate is more than the composting rate until 2012 but in 2014 a greater % of waste is composted than recycled.' or 'More waste is recycled than is composted until 2012. (After that there is about the same amount of each).'</p>	<p>E1</p>	<p>A comparison does not need to mention the years but must mention composting <b>and</b> recycling.</p> <p>Allow e.g. 'Waste recycled has eventually begun to fall where compost has continued to gradually rise, (eventually taking over recycled waste)' or 'As the percentage of composting has increased the percentage of recycling has declined from 2008' or 'More waste is being recycled and composted in 2014 than in 2002' or 'Both the waste recycling and composting have increased between 2002 and 2014'</p>
	<p>(4)</p>	
<p>24.*(a) Valid comment e.g. 'The groups overlap so people who spent £20 may be in different groups.' or 'His groups are too big.' or 'You cannot tell which group 40 is in.'</p>	<p>E1</p>	<p>Do not allow comments such as 'The ages in the groups are too big'</p>
<p>(b) <math>\frac{1}{100}</math> or equivalent</p>	<p>B2</p>	<p>B1 for <math>\frac{1}{10} \times \frac{1}{10}</math> or equivalent</p>
	<p>(3)</p>	

<p>25.*(a)</p> $12x - 7x = 6 + 9 \text{ or } x = \frac{15}{5} \text{ or equivalent}$ <p><math>x = 3</math></p>	<p>B1</p> <p>B1</p>	<p>Seen or implied FT until 2nd error</p> <p>Mark final answer; allow embedded answer for 2</p>
<p>(b)</p> $10x + 20 - (2x - 9) = 30 \text{ or}$ $10(x + 2) - 2x + 9 = 30 \text{ or better}$ $10x - 2x = 30 - 9 - 20 \text{ or better}$ $x = \frac{1}{8} \text{ ISW}$	<p>B1</p> <p>B1</p> <p>B1</p>	<p>FT until 2nd error Seen or implied For expanding at least one pair of brackets correctly</p> <p>FT For collecting terms</p> <p>FT; if FT the common error <math>8x = 19</math>, then the answer must be 2.375 or <math>\frac{19}{8}</math>, not rounded to e.g. 2.3</p>
<p>(c)(i)</p> $10x \leq 15 \text{ or equivalent}$ $x \leq 1.5 \text{ or equivalent}$	<p>M1</p> <p>A1</p>	<p>Mark final answer No marks for use of "=", unless finally replaced to give <math>x \leq 1.5</math> then award M1 A1.</p>
<p>(ii)</p> <p>Solid circle at 1.5 with arrow left</p>	<p>B1</p>	<p>STRICT FT 'their (c)(i)' provided an inequality Accept any unambiguous notation provided there is no termination (so not a line with a circle at each end)</p>
<p>(d)</p> <p>No with valid explanation. e.g. 'The correct answers are <math>x = 3</math> and <math>x = 2</math>.' or 'She has forgotten to put <math>x - 3</math> and <math>x - 2</math> equal to 0 and solve.' or 'When <math>x = -3</math> the value is 30.' or 'The correct solution is <math>x = 3</math> or <math>x = 2</math>.'</p>	<p>E1</p>	<p>Do not accept e.g. 'The values do not work' without supporting evidence.</p> <p>Allow 'No and <math>(-3 - 3) = -6</math> and <math>(-2 - 2) = -4</math>'</p>
	<p>(9)</p>	

