

COMPONENT 1: NON-CALCULATOR MATHEMATICS, FOUNDATION TIER**GENERAL INSTRUCTIONS for MARKING GCSE Mathematics**

1. The mark scheme should be applied precisely and no departure made from it. Marks should be awarded directly as indicated and no further subdivision made. When a candidate follows a method that does not correspond to the methods explicitly set out in the mark scheme, marks should be awarded in the spirit of the mark scheme. In such cases, further advice should be sought from the Team Leader or Principal Examiner.

2. Marking Abbreviations

The following may be used in marking schemes or in the marking of scripts to indicate reasons for the marks awarded.

CAO = correct answer only

MR = misread

PA = premature approximation

bod = benefit of doubt

oe = or equivalent

si = seen or implied

ISW = ignore subsequent working

F.T. = follow through (✓ indicates correct working following an error and ✗ indicates a further error has been made)

Anything given in brackets in the marking scheme is expected but, not required, to gain credit.

3. Premature Approximation

A candidate who approximates prematurely and then proceeds correctly to a final answer loses 1 mark as directed by the Principal Examiner.

4. Misreads

When the data of a question is misread in such a way as not to alter the aim or difficulty of a question, follow through the working and allot marks for the candidates' answers as on the scheme using the new data.

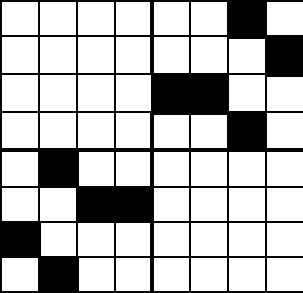
This is only applicable if a wrong value, is used consistently throughout a solution; if the correct value appears anywhere, the solution is not classed as MR (but may, of course, still earn other marks).

5. Marking codes

- 'M' marks are awarded for any correct method applied to appropriate working, even though a numerical error may be involved. Once earned they cannot be lost.
- 'm' marks are dependant method marks. They are only given if the relevant previous 'M' mark has been earned.
- 'A' marks are given for a numerically correct stage, for a correct result or for an answer lying within a specified range. They are only given if the relevant M/m mark has been earned either explicitly or by inference from the correct answer.
- 'B' marks are independent of method and are usually awarded for an accurate result or statement.
- 'S' marks are awarded for strategy
- 'E' marks are awarded for explanation
- 'U' marks are awarded for units
- 'P' marks are awarded for plotting points
- 'C' marks are awarded for drawing curves

COMPONENT 1: NON-CALCULATOR MATHEMATICS, FOUNDATION TIER

Specimen Assessment Materials Non-calculator Foundation	Mark	Elements linked to AOs	Comments
1. 10 13 27 8	B1 B1 B1 B1 (4)	1.1 1.1 1.1 1.1 (4)AO1 (0)AO2 (0)AO3	
2. Seven million five hundred thousand 9000 3687	B1 B1 B1 (3)	1.2 1.1 1.3a (3)AO1 (0)AO2 (0)AO3	Accept seven and a half million Or 9 thousand. Accept thousand(s) but not 1000(s)
3. (a) Showing '20 to 24' AND '25 (to 29)' Showing (6) 8 5 13 (b) Uniform scale for the frequency axis starting at 0. Four bars at correct heights.	B1 B1 B1 B1 (4)	2.1a 1.3a 2.3b 2.3b (1)AO1 (3)AO2 (0)AO3	F.T. their intervals, provided not overlapping. For the 8, 5 and 13. B0 for ambiguous placement of scale numbers. F.T. their numbers in (a). If no scale shown, assume intervals of 1 from 0 to 15. Penalise uneven bar widths –1.
4. (a) 2190 54 000 (b) Sensible estimates that would lead to single digit multiplication. Correct answer from their estimates.	B1 B1 M1 A1 (4)	1.1 1.1 1.3a 1.3a (4)AO1 (0)AO2 (0)AO3	Accept 50×3.9 , 51×4 or 50×4 Award M1 A1 for unsupported answers of 200, 195 or 204 Award M0 A0 for $(51 \times 3.9 =) 198.9$

Specimen Assessment Materials Non-calculator Foundation	Mark	Elements linked to AOs	Comments
5. <div style="text-align: center;">  </div>	B2	1.3a	B1 for each quadrant
6. (a) 262 (b) Thursday Tuesday (c) Comment regarding some cars leaving and others taking their place. (d) (Total number of cars Mon-Fri) 538 (538 × 2 =) (£)1076 (e) (¼ of 800 =) 200 (Charge =) (800-200) × (£)1.5(0) <div style="text-align: right;">Less and (£)900</div> (f) One assumption stated e.g. “the car parking pattern was the same each week” OR “the week considered was typical” OR “the same amount was collected each week” OR “the car park was open for 52 weeks” Stating how the results would be different e.g. “If the car park was not open for 52 weeks the total could be lower” OR “some weeks could be much busier so the total would be more”	B1 B2 E1 B1 B1 B1 M1 A1 E1 E1	1.3a 2.3a 2.4a 1.3b 1.3b 1.3a 3.1d 2.1b 3.4a 3.5	B1 for each. Allow SC1 if reversed. Accept valid and relevant equivalent comments. F.T. 800 – ‘their (a)’ F.T. ‘their 538’ <u>Alternative method:</u> $104 \times 2 + 43 \times 2 + 112 \times 2 + 163 \times 2 + 116 \times 2$ <i>M1 (must show intent to add for the M1)</i> (£)1076 A1
7. A = 14 B = 15 C = 6	B1 B1 B1 (3)	1.3a 1.3a 1.3a (3)AO1 (0)AO2 (0)AO3	

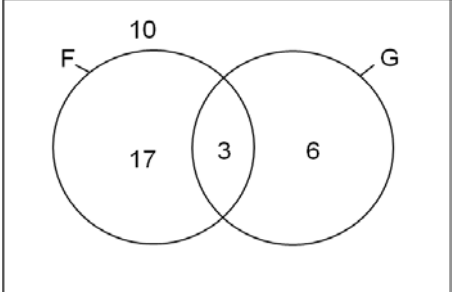
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Specimen Assessment Materials Non-calculator Foundation	Mark	Elements linked to AOs	Comments												
<p>8. (a) Line measured as 7.6 (cm) Evidence of multiplying by 10. 76 km</p> <p>(b) Sight of 2×40 or 80 or $76/40$ or 1.9 YES and explanation e.g. because $2 \times 40 > 76$ or $76/40 < 2$ or $1.9 < 2$</p>	<p>B1 M1 A1</p> <p>B1 E1</p> <p>(5)</p>	<p>1.3b 1.3b 1.3b</p> <p>2.4a 2.4a</p> <p>(3)AO1 (2)AO2 (0)AO3</p>	<p>Allow ± 0.2 cm F.T. 'their length'. Must show units.</p> <p>Any equivalent convincing argument. F.T. 'their 76'.</p>												
<p>9. (a) Rounded values</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>Chicken curry</td> <td>£3</td> </tr> <tr> <td>Pizza</td> <td>£3</td> </tr> <tr> <td>Washing Powder</td> <td>£6 or £6.10</td> </tr> <tr> <td>Butter</td> <td>£1 or £1.50</td> </tr> <tr> <td>Bread</td> <td>£1 or 90p</td> </tr> </tbody> </table> <p>Approximate total = £14 or £13.90 or £14.10 or £14.50 or £14.60 or £14.40</p> <p>(b) Suitable explanation e.g. "shopkeeper added £89 not 89p".</p>	Item	Cost	Chicken curry	£3	Pizza	£3	Washing Powder	£6 or £6.10	Butter	£1 or £1.50	Bread	£1 or 90p	<p>B2</p> <p>B1</p> <p>E1</p> <p>(4)</p>	<p>1.3a</p> <p>1.3a</p> <p>2.5a</p> <p>(3)AO1 (1)AO2 (0)AO3</p>	<p>Award B2 for all 5 values rounded. Award B1 for 3 or 4 values rounded.</p> <p>F.T. their approximated values if at least B2 awarded. If prices are added to give £14.12 and approximate value of £14 given, award final B1. Accept "he forgot the decimal point for the 89 pence"</p>
Item	Cost														
Chicken curry	£3														
Pizza	£3														
Washing Powder	£6 or £6.10														
Butter	£1 or £1.50														
Bread	£1 or 90p														
<p>10. $(32 - 18) \div 2$ 7 (cm)</p>	<p>M1 A1</p> <p>(2)</p>	<p>3.1c 1.3a</p> <p>(1)AO1 (0)AO2 (1)AO3</p>	<p>Or equivalent</p>												
<p>11. (a) $9a + 8b$</p> <p>(b) $3y - 6$</p> <p>(c) $6y^2$</p> <p>(d) y^4</p>	<p>B2 B1 B1 B1</p> <p>(5)</p>	<p>1.3a 1.3a 1.2 1.2</p> <p>(5)AO1 (0)AO2 (0)AO3</p>	<p>B1 for $9a + kb$ or B1 for $ka - 2b$.</p>												
<p>12. Missing side segment = 4 (Perimeter=) $7+3+7+4+3+7+3+4+7+3$ $= 48$ (cm)</p>	<p>B1 M1</p> <p>A1</p> <p>(3)</p>	<p>2.3a 3.1a</p> <p>1.3a</p> <p>(1)AO1 (1)AO2 (1)AO3</p>	<p>May be implied by correct working Attempt to all 10 sides of the shape F.T. their '4' but M0 if 7 OR 3 used instead of 4 CAO</p>												

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13. $2 \times 60 + 1$ OR $60 + 61$ or equivalent = 121	M1 A1 (2)	3.1a 2.1a (0)AO1 (1)AO2 (1)AO3	
14. (a) $720 - \frac{1}{2} \times 720 - \frac{2}{5} \times 720$ or equivalent Sight of (£)288 (Amount left) (£)72 (b) $\frac{72}{720} \times 100$ = 10(%)	M1 B1 A1 M1 A1 (5)	1.3b 1.3b 1.3b 1.3a 1.3a (5)AO1 (0)AO2 (0)AO3	<u>Alternative method:</u> $(1 - \frac{1}{2} - \frac{2}{5}) \times 720$ or equivalent M2 Award M1 for sight of 1/10 or equivalent A1 = (£)72 For A1, F.T. (£)720 – ‘their (£)360’ – ‘their (£)288’ Two amounts must be subtracted from (£)720. F.T. ‘their £72’ <u>Alternative method:</u> $100(\%) - 50(\%) - 40(\%)$ M1 = 10(%) A1
15. (a) 10(:00) 1(:00) 4(:00) OR 10(:)00 13(:)00 16(:)00 Correct notation ‘a.m./p.m.’ (b) 9(°C) (c) $(14 + 18 + 23 + 19 + 16) / 5$ = 18(°C) (d) Any statement that refers to other possible temperatures, apart from the five recorded.	B1 B1 B1 M1 A1 E1 (6)	1.3a 1.2 1.3a 1.3a 1.3a 2.4a (5)AO1 (1)AO2 (0)AO3	Ignore notation for this B1 CAO Must refer to other temperatures. ‘It was done every 3 hours’ is not sufficient (E0).
16. (Area =) $\frac{1}{2}(4 + 5) \times 6$ or equivalent $27(\text{m}^2)$ (Cost =) $\frac{27}{18} \times 60$ or equivalent = (£)90	M1 A1 M1 A1 (4)	3.1d 1.3a 3.2 1.3a (2)AO1 (0)AO2 (2)AO3	F.T. ‘their area’.

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Specimen Assessment Materials Non-calculator Foundation	Mark	Elements linked to AOs	Comments
17. $\hat{ABC} = 50^{(\circ)}$ $\hat{BAC} = 180^{(\circ)} - 80^{(\circ)} - 50^{(\circ)}$ $= 50^{(\circ)}$ Convincing statement	B1 M1 A1 E1 (4)	2.2 2.2 2.2 2.2 (0)AO1 (4)AO2 (0)AO3	Look for angles shown on diagram. F.T. $180^{(\circ)} - 80^{(\circ)} - \text{'their } 50^{(\circ)}$
18.(a) (i) A comment that states or implies that we do not know the actual numbers. (ii) A comment that states or implies that we do not know the pass rate between 2005 and 2010. (b) False AND a counter example given.	B1 B1 B1 (3)	2.5b 2.5b 2.5a (0)AO1 (3)AO2 (0)AO3	
19. Attempt to repeatedly divide by 2 105 cm or 52.5 cm seen from correct working After 4 bounces.	M1 A1 A1 (3)	3.1c 1.3a 3.3 (1)AO1 (0)AO2 (2)AO3	At least 2 divisions needed for M1
20. (a) (i) Area of B = $(4 \times 3) \times 3$ $36 \text{ (cm}^2\text{)}$ Two values whose product is 36 (ii) Two different values whose product is 36. (b) NO (because) their sides are not in a common ratio.	M1 A1 B1 B1 E1 (5)	3.2 1.3a 3.1a 1.3a 2.4a (2)AO1 (1)AO2 (2)AO3	F.T. 'their area for B'. F.T. 'their area for B'. Accept convincing statement.

Specimen Assessment Materials Non-calculator Foundation	Mark	Elements linked to AOs	Comments
<p>21. Setting up a Venn diagram with a rectangle containing two intersecting circles and placing either 17 or 6 correctly.</p> <p>Finding the other of 6 or 17.</p> <p>Neither French nor German = 10 Probability (neither) = $\frac{10}{36}$</p> 	<p>M1</p> <p>M1</p> <p>A1</p> <p>A1</p> <p>(4)</p>	<p>3.1c</p> <p>3.1c</p> <p>1.3a</p> <p>1.3a</p> <p>(2)AO1 (0)AO2 (2)AO3</p>	<p>Accept alternative appropriate diagram.</p> <p><i>Alternative method (without a diagram):</i> $20 - 3 = 17$ OR $9 - 3 = 6$ M1 $17 + 9 = 26$ OR $20 + 6 = 26$ OR $17 + 3 + 6 = 26$ M1</p> <p>F.T. 'their 10'</p>
<p>22. (a) $2x(3x + 4)$</p> <p>(b) $(x - 10)(x + 10)$</p>	<p>B2</p> <p>B1</p> <p>(3)</p>	<p>1.3a</p> <p>1.3a</p> <p>(3)AO1 (0)AO2 (0)AO3</p>	<p>B1 for a correct partially factorised expression OR sight of $2x(3x \dots)$ or $2x(\dots + 4)$</p>
<p>23. (a) $2400 \div 8 \div 10$ or equivalent.</p> <p>Statement that 30 bulbs must have been used</p> <p>(b) $2400 \div 400$ or equivalent 6p or £0.06</p> <p>(c) Correct conclusion e.g. 'the cost of a bulb must be between 6p and 8p'.</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>E1</p> <p>(5)</p>	<p>3.1d</p> <p>2.1b</p> <p>3.1d</p> <p>1.3a</p> <p>2.1a</p> <p>(1)AO1 (2)AO2 (2)AO3</p>	<p>Accept $30 \times 10 \times 8p = 2400$</p> <p>Unsupported 30 is awarded M1A0</p> <p>Units required.</p> <p>F.T their '6p'</p>
<p>24.(a) Correctly completing the tree diagram 0.6, 0.3, 0.3, 0.7</p> <p>(b) $0.4 \times 0.7 = 0.28$</p> <p>(c) $0.6 \times 0.7 = 0.42$</p>	<p>B2</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>(6)</p>	<p>2.3b</p> <p>2.3a</p> <p>1.3a</p> <p>2.3a</p> <p>1.3a</p> <p>(2)AO1 (4)AO2 (0)AO3</p>	<p>B1 for any one pair of branches correct (total 1)</p> <p>Or other complete method. FT for their $P(\text{walk to college}) \times P(\text{walk home})$ correctly evaluated, or by alternative method</p>

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Specimen Assessment Materials Non-calculator Foundation	Mark	Elements linked to AOs	Comments
<p>25. Correctly engaging with ratios to find values that can be used on the graph e.g. Finding the ratio of red : white to be 4 : 5 OR <i>Reducing</i> the ratio of 4 : 9 to enable use on graph e.g. 2 : 4.5 or 1 : 2.25</p>	M1	2.3a	<p>Seen or implied.</p> <p>Ignore incorrect use of 4 : 9 as red : white for this M1</p>
<p>Using a value for white paint to find a non-zero value of red paint. e.g. 2 litres of white paint gives 1.6 litres of red paint. OR (4.5 – 2 =) 2.5 litres of white paint gives 2 litres of red paint. OR 1.25 litres of white paint gives 1 litre of red paint.</p>	M1	3.1b	<p>The value must be one that can be read off the graph. This may be implied from markings on the diagram but the value does not need to be indicated on the diagram. Do NOT F.T. from incorrect interpretation of 4 : 9 as red paint : white paint</p>
<p>Using the red paint value found to fill in one of the non-zero values required on the red paint axis. e.g. 1.6 found from conversion, then 1.5 indicated on the axis. (The values are 0.5, 1, 1.5, 2, 2.5.)</p>	A1	3.1b	<p>This mark depends on both previous M marks. Some correct working must be shown. (This could be in the diagram.)</p>
<p>Correctly filling in all the remaining numbers on the red paint axis: 0, 0.5, 1, 1.5, 2, 2.5</p>	A1	2.3b	CAO
<p>26. Method to form two correct equations and eliminate one variable First variable found correctly Substitute to find the second variable Tin = £5 and Brush = £2</p>	<p>M1</p> <p>A1</p> <p>m1</p> <p>A1</p> <p>(4)</p>	<p>3.1d</p> <p>1.3a</p> <p>3.1d</p> <p>3.3</p> <p>(1)AO1 (0)AO2 (3)AO3</p>	<p>Allow 1 error in one term, not one with equal coefficients</p> <p>Tin = £5 or Brush = £2. F.T. 'their first variable'</p>

Specimen Assessment Materials Non-calculator Foundation	Mark	Elements linked to AOs	Comments
27. Setting up one of two models (needing 3 strips along 8m or 5 strips along 13m)	S1	3.1d	For the strategy and finding the need for 3 or 5 strips of carpet as appropriate
(Cost along 8m side =) $13 \times 3 \times (\pounds) 25$	M1	3.1d	Finding the cost of the carpet for their model F.T. their number of strips
(Cost along 13m side =) $8 \times 5 \times (\pounds) 25$	M1	3.1d	Finding the cost of the carpet for their model F.T. their number of strips
(\pounds) 975 AND (\pounds) 1000	A1	1.3a	
8m method is cheaper by (\pounds) 25	A1	3.4b	F.T. for their costs provided at least S1 awarded. Must state which method is cheaper for their costs
	(5)	(1)AO1 (0)AO2 (4)AO3	
28. 1.5×10^9	B2	1.3b	B1 for correct value not in standard form e.g. 15×10^8 or 1500 000 000
	(2)	(2)AO1 (0)AO2 (0)AO3	
29. (a) $24 \times \frac{45}{30}$ $\times \frac{10}{15}$	M1	3.1c	Or equivalent.
	M1	3.1c	Or equivalent (the 24 must have been used). M1 for correctly using two of the operators ' $\times 45$ ', ' $\div 30$ ', ' $\times 10$ ' and ' $\div 15$ ' with the 24.
= 24 (workers)	A1	1.3a	C.A.O. Do not penalise pre-approximations as long as 24 is given as the final answer. <i>Alternative presentation:</i> <u>Area</u> <u>Time</u> <u>Workers</u> 30 10 24Award M1 for correct step(s) to 45Award M1 for correct step(s) to 15 45 15 <u>24</u> A1 C.A.O.
(b) Stating one assumption made e.g. 'similar work will be carried out on the other site' or 'all workers will work at the same rate' or similar. Stating an impact e.g. 'if the work is harder or the workers are slower, then more workers will be needed.'	E1	3.4a	
	E1	3.5	
	(5)	(1)AO1 (0)AO2 (4)AO3	

