OCR
Oxford Cambridge and RSA

F

Date – Morning/Afternoon

GCSE (9–1) Mathematics

J560/02 Paper 2 (Foundation Tier)

SAMPLE MARK SCHEME

Duration: 1 hour 30 minutes

MAXIMUM MARK 100

DRAFT

Subject-Specific Marking Instructions

1. **M** marks are for using a correct method and are not lost for purely numerical errors.
   A marks are for an accurate answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
   B marks are independent of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.
   SC marks are for special cases that are worthy of some credit.

2. Unless the answer and marks columns of the mark scheme specify **M** and **A** marks etc, or the mark scheme is 'banded', then if the correct answer is clearly given and is not from wrong working **full marks** should be awarded.

   Do not award the marks if the answer was obtained from an incorrect method, ie incorrect working is seen and the correct answer clearly follows from it.

3. Where follow through (**FT**) is indicated in the mark scheme, marks can be awarded where the candidate's work follows correctly from a previous answer whether or not it was correct.

   Figures or expressions that are being followed through are sometimes encompassed by single quotation marks after the word *their* for clarity, e.g. FT 180 × (*their* '37' + 16), or FT 300 – √(*their* '$5^2 + 7^2$'). Answers to part questions which are being followed through are indicated by e.g. FT 3 × *their* (a).

   For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.

4. Where dependent (**dep**) marks are indicated in the mark scheme, you must check that the candidate has met all the criteria specified for the mark to be awarded.

5. The following abbreviations are commonly found in GCSE Mathematics mark schemes.

   - **figs 237**, for example, means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point e.g. 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
   - **isw** means **ignore subsequent working** after correct answer obtained and applies as a default.
   - **nfww** means **not from wrong working**.
   - **oe** means **or equivalent**.
   - **rot** means **rounded or truncated**.
   - **seen** means that you should award the mark if that number/expression is seen anywhere in the answer space, including the answer line, even if it is not in the method leading to the final answer.
   - **soi** means **seen or implied**.

6. In questions with no final answer line, make no deductions for wrong work after an acceptable answer (ie **isw**) unless the mark scheme says otherwise, indicated by the instruction 'mark final answer'.

7. In questions with a final answer line following working space:

   (i) If the correct answer is seen in the body of working and the answer given on the answer line is a clear transcription error allow full marks unless the mark scheme says 'mark final answer'. Place the annotation ✓ next to the correct answer.

   (ii) If the correct answer is seen in the body of working but the answer line is blank, allow full marks. Place the annotation ✓ next to the correct answer.

   (iii) If the correct answer is seen in the body of working but a completely different answer is seen on the answer line, then accuracy marks for the answer are lost. Method marks could still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation × next to the wrong answer.

8. In questions with a final answer line:

   (i) If one answer is provided on the answer line, mark the method that leads to that answer.

   (ii) If more than one answer is provided on the answer line and there is a single method provided, award method marks only.

   (iii) If more than one answer is provided on the answer line and there is more than one method provided, award zero marks for the question unless the candidate has clearly indicated which method is to be marked.

9. In questions with no final answer line:

   (i) If a single response is provided, mark as usual.

   (ii) If more than one response is provided, award zero marks for the question unless the candidate has clearly indicated which response is to be marked.

10. When the data of a question is consistently misread in such a way as not to alter the nature or difficulty of the question, please follow the candidate's work and allow follow through for **A** and **B** marks. Deduct 1 mark from any **A** or **B** marks earned and record this by using the MR annotation. **M** marks are not deducted for misreads.

11. Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures even if this is rounded or truncated on the answer line. For example, an answer in the mark scheme is 15.75, which is seen in the working. The candidate then rounds or truncates this to 15.8, 15 or 16 on the answer line. Allow full marks for the 15.75.

12. Ranges of answers given in the mark scheme are always inclusive.

13. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your Team Leader.

14. Anything in the mark scheme which is in square brackets […] is not required for the mark to be earned, but if present it must be correct.

Question			Answer	Marks	Part marks and guidance	
1	(a)		7	**1** **1 AO1.3a**		
	(b)		4	**1** **1 AO1.3a**		
2	(a)		0.1	**2** **2 AO1.3a**	**M1** for 0.4 + 0.2 + 0.3 **soi** or 1 – *their* '0.9'	
	(b)		0.7	**2** **2 AO1.3a**	**M1** for 0.4 and 0.3 identified	
3	(a)		Any two odd primes added correctly	**1** **1 AO2.1a**	e.g. 3 + 5 = 8	
	(b)		An odd integer squared with correct result	**1** **1 AO2.1a**	e.g. $5^2 = 25$	
4			[£]1800	**4** **2 AO1.3b** **2 AO3.1d**	**M1** for $\frac{1}{4}+\frac{1}{2}=\frac{3}{4}$ **soi** **M1** for $\frac{1}{4}(\text{of the rent}) = 450$ **M1** for 450×4	**oe** using percentages or decimals
5	(a)		China	**1** **1 AO2.3a**		
	(b)		27 100 000	**1** **1 AO1.3a**		
	(c)		7.82×10^9	**2** **1 AO1.2** **1 AO1.3a**	**M1** for attempting to multiply by 1000	
	(d)		7.85×10^7	**2** **2 AO1.3a**	**M1** for 9.9 – 2.05 **soi**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part marks and guidance</th><th></th></tr>
<tr><td>6</td><td>(a)</td><td></td><td>40 (cm)</td><td>2
1 AO1.3a
1 AO3.1a</td><td>M1 for 4 × their '$\sqrt{100}$'</td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>Correct working leading to 4 cm</td><td>4
1 AO1.3b
2 AO2.2
1 AO2.4a</td><td>B1 for area of triangle is 24
B1 for their '24' × 3
B1 for their '72' ÷ 18 or
area of parallelogram = 18h</td><td></td></tr>
<tr><td>7</td><td>(a)</td><td></td><td>54</td><td>1
1 AO3.1a</td><td></td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>5</td><td>2
1 AO1.1
1 AO3.1a</td><td>M1 for a complete factor tree oe</td><td></td></tr>
<tr><td>8</td><td>(a)</td><td></td><td>8</td><td>3
2 AO1.3a
1 AO3.1b</td><td>M1 for dividing by 3 or 13
M1 for dividing by remaining factor</td><td>M1 for multiplying 3 by 13
M1 for dividing by 39 or listing multiples of 39</td></tr>
<tr><td></td><td>(b)</td><td></td><td>Any three valid answers
e.g. 2, 7, 23</td><td>3
1 AO1.1
2 AO3.1a</td><td>B1 for each

If zero scored SC1 for at least 3 primes and 3 squares seen</td><td></td></tr>
<tr><td>9</td><td>(a)</td><td></td><td>
<table>
<tr><th>Prism</th><th>Number of faces</th><th>Number of edges</th><th>Number of vertices</th></tr>
<tr><td>Triangular (3 sides)</td><td>5</td><td>9</td><td>6</td></tr>
<tr><td>Rectangular (4 sides)</td><td>6</td><td>12</td><td>8</td></tr>
<tr><td>Pentagonal (5 sides)</td><td>7</td><td>15</td><td>10</td></tr>
<tr><td>Hexagonal (6 sides)</td><td>8</td><td>18</td><td>12</td></tr>
</table>
</td><td>2
1 AO1.1
1 AO2.1a</td><td>B1 for 2 correct</td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>300 (edges)
200 (vertices)</td><td>1
1
2 AO2.1a</td><td></td><td></td></tr>
</table>

Question			Answer	Marks	Part marks and guidance	
	(c)		$F = N + 2$ **oe**	**2** **1 AO2.3a** **1 AO2.3b**	**B1** for $N + 2$ (without a subject)	Condone for **B1** a correct word formula
10	**(a)**	**(i)**	Positive correlation	**1** **1 AO1.1**		Condone 'positive' or correct description, e.g. 'As the temperature increases, more ice creams are sold'
		(ii)	Correct reason, e.g. 'He sold far more ice creams than you would expect him to for a 20°C day'	**1** **1 AO2.3a**		
	(b)	**(i)**	75-95	**1** **1 AO1.3a**		
		(ii)	140-170	**1** **1 AO1.3a**		
		(iii)	The **(b)(i)** prediction is more reliable, as it is within the range of the given data	**2** **1 AO2.1b** **1 AO2.4a**	**B1** for **(b)(i)** prediction identified with partial reason	
	(c)		No, because there may be other factors involved	**2** **1 AO2.5a** **1 AO3.4b**	**B1** for 'No', with partial reason	
11	**(a)**		45 000	**2** **2 AO1.3a**	**M1** for 50 000 × 0.9 **soi** or 50 000 – 5000	
	(b)		Total value of goods sold in May was £32 805, which is less than £35 000	**3** **3 AO2.2**	**M2** for 50 000 (or 45 000) × 0.9 used three times (or two times) **soi** or decreasing by 10% three times Or **M1** for 45 000 × 0.9 or 45 000 – 4500	Implied by 36 450 and 32 805 Implied by 40 500

Question			Answer	Marks	Part marks and guidance	
	(c)		8	**5** **3 AO1.3b** **2 AO3.1d**	**M2** for 100 000 × 1.2 × 0.9 Or **M1** for 100 000 × 1.2 **oe** **M1** for *their* '120 000' × 0.9 **oe** And **A1** for 108 000 **M1** for $\frac{\textit{their}\text{ '108 000'} - 100\,000}{100\,000} \times 100$ **oe**	
12	**(a)**		6	**2** **2 AO1.3a**	**M1** for $3x = 18$	
	(b)		-3 -5	**3** **3 AO1.3a**	**M2** for $(x + 3)(x + 5)$ seen or implied in table Or **M1** for $(x \pm 3)(x \pm 5)$ seen or pair of factors giving two correct terms seen or implied in table And **B1** for correct solutions **FT** *their* quadratic factors	
13	**(a)**		24 cm by 16 cm 12 cm by 8 cm	**2** **1 AO1.3a** **1 AO3.1c**	**B1** for each	Answers may be indicated on the list in the question

Question			Answer	Marks	Part marks and guidance	
	(b)		50	**3** **1 AO1.3b** **2 AO3.1d**	**M1** for $\frac{45}{9}$ or $\frac{60}{6}$ **M1** for *their* '5' × *their* '10' **SC2** for 42 or for area calculation leading to incorrect answer	
14	**(a)**		[*p* =] 5 [*q* =] ⁻5	**2** **1 AO1.2** **1 AO1.3a**	**B1** for each	
	(b)		**c** = 3**a** **d** = **a** + **b** **e** = **a** – **b**	**3** **3 AO1.3a**	**B1** for each	
15	**(a)**		800	**2** **1 AO1.3b** **1 AO3.1c**	**M1** for unitary work, e.g. 1 person does 200 letters in 2 hours	
	(b)		30 minutes **oe**	**4** **2 AO2.1a** **2 AO3.1d**	**M1** for 1 person does 100 letters in 1 hour **M1** for 5 people do 1000 letters in 2 hours **M1** for 4 people do 1000 letters in 2.5 hours **FT** from *their* rate in **(a)** throughout	

Question			Answer	Marks	Part marks and guidance	
	(c)		Correct comment on the reasonableness of her assumption e.g. 'She has assumed that 'all day' means 'for 24 hours', but it is not reasonable for them to work without a break.' Correct comment on the effect it will have on the answer e.g. 'They can't work at that rate for that long, so her answer is an over-estimate.'	**2** **1 AO3.4a** **1 AO3.5**	**B1** for each	
16	**(a)**		Outcomes not equally likely **oe**	**1** **1 AO3.4b**		
	(b)		Larger number of trials	**1** **1 AO3.4a**		
	(c)		0.09 - 0.16	**2** **1 AO1.3a** **1 AO2.1b**	**M1** for $\left(\frac{48}{150}\right)^2$ or 0.35^2 or any reasonable estimate (**FT** *their* **(b)**)	
17	**(a)**		10, 16, 26	**1** **1 AO1.3a**		
	(b)		8, 13, 21	**2** **1 AO1.3a** **1 AO3.1a**	**M1** for one correct subtraction of two boxes	
	(c)		$a + b$, $a + 2b$, $2a + 3b$	**2** **2 AO1.3a**	**M1** for two expressions correct	
	(d)		15, 21, 36	**3** **1 AO1.3a** **2 AO2.1a**	**M1** for *their* '$2a + 3b$' = 57 **M1** for substituting $a = 6$ into *their* final expression and solving for b	
18	**(a)**		The first error is in step 2 $-3x - 2x = -5x$, not $-x$ as given	**2** **2 AO2.5a**	**B1** for identifying step 2 **B1** for explaining the error	

Question			Answer	Marks	Part marks and guidance	
	(b)		$[x^2 + 4x + x + 4 = x^2 - 3x - 2x + 6]$ $x^2 + 5x + 4 = x^2 - 5x + 6$ $5x + 4 = -5x + 6$ $10x + 4 = 6$ $10x = 2$ $x = \frac{1}{5}$	**2** **2 AO1.3a**	**M1** for an attempt to correct the solution in line with their answer to **(a)**	
19			$2a + 1$	**4** **1 AO1.3b** **2 AO3.1b** **1 AO3.2**	**M1** for $a + 2 + 3a + 3 + 4a - 1$ **M1** for collecting terms **M1** for dividing *their* '$8a + 4$' by 4	

Assessment Objectives (AO) Grid

Question	AO1	AO2	AO3	Total
1(a)	1			1
1(b)	1			1
2(a)	2			2
2(b)	2			2
3(a)		1		1
3(b)		1		1
4	2		2	4
5(a)		1		1
5(b)	1			1
5(c)	2			2
5(d)	2			2
6(a)	1		1	2
6(b)	1	3		4
7(a)			1	1
7(b)	1		1	2
8(a)	2		1	3
8(b)	1		2	3
9(a)	1	1		2
9(b)		2		2
9(c)		2		2
10(a)(i)	1			1
10(a)(ii)		1		1
10(b)(i)	1			1
10(b)(ii)	1			1
10(b)(iii)		2		2
10(c)		1	1	2
11(a)	2			2
11(b)		3		3
11(c)	3		2	5
12(a)	2			2
12(b)	3			3
13(a)	1		1	2
13(b)	1		2	3
14(a)	2			2
14(b)	3			3
15(a)	1		1	2
15(b)		2	2	4
15(c)			2	2
16(a)			1	1
16(b)			1	1
16(c)	1	1		2
17(a)	1			1
17(b)	1		1	2
17(c)	2			2
17(d)	1	2		3
18(a)		2		2
18(b)	2			2

19	1		3	**4**
Totals	**50**	**25**	**25**	**100**