

**OCR**

Oxford Cambridge and RSA

**Date – Morning/Afternoon**

**GCSE (9–1) Mathematics**

**J560/01 Paper 1 (Foundation Tier)**

**F**

**SAMPLE MARK SCHEME**

**Duration: 1 hour 30 minutes**

**MAXIMUM MARK 100**

**DRAFT**

**This document consists of 14 pages**

### 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<sup>2</sup> + 7<sup>2</sup>). Answers to part questions which are being followed through are indicated by e.g. FT 3 × *their* (a).

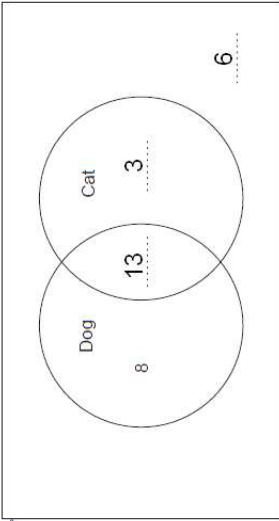
- For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.
4. Where dependent (**dep**) marks are indicated in the mark scheme, you must check that the candidate 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.
    - **nfw** 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**.

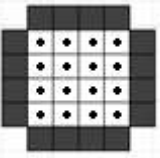
- In questions with no final answer line, make no deductions for wrong work after an acceptable answer (ie **isw**) unless the mark scheme says otherwise, indicated by the instruction 'mark final answer'.
- In questions with a final answer line following working space:
  - If the correct answer is seen 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.
  - 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.
  - 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.
- In questions with a final answer line:
  - If one answer is provided on the answer line, mark the method that leads to that answer.
  - If more than one answer is provided on the answer line and there is a single method provided, award method marks only.
  - 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.
- In questions with no final answer line:
  - If a single response is provided, mark as usual.
  - 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.
- 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)	1 : 50	2 2 AO1.3a	M1 shows a partial simplification e.g. 4 : 200
(b)	50 300	2 2 AO1.3a	M1 for $350 \div (1 + 6)$
(c)	90	2 2 AO1.3a	M1 for $10\% = 45$ <b>soi</b> or M1 for $450 \times 0.2$
2	$3.5\%, \frac{1}{3}, 0.34$	2 2 AO1.3a	B1 for $\frac{1}{3} = 0.33\dots$ or $33. \dots \%$ or B1 for $0.34 = 34\%$ or B1 for changing $3.5\%$ to $0.035$ or SC1 for $\frac{1}{3}, 0.34, 3.5\%$
3	£1.38 with working shown	3 1 AO1.3a 1 AO3.1d 1 AO3.3	M1 for $7 \times \frac{3}{8}$ M1 for $89p + 49p$ or $3 \times 49p$ or $2 \times 49p > 89p$ OR B1 for £1.38 without working
			Condone 138p

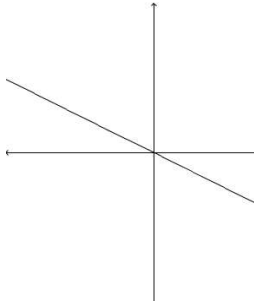
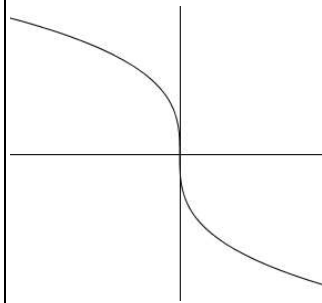
Question	Answer	Marks	Part marks and guidance
4 (a) (i)	5	1 1 AO1.1	
(ii)	1	1 1 AO1.1	
(iii)	Any number apart from 1, 3 or 5	1 1 AO1.1	
(b)	Three different numbers only 6 appears most More even numbers than odd	3 3 AO2.1a	B1 for each of the three properties
5	48 (cm <sup>2</sup> )	3 1 AO1.3a 2 AO3.1b	M1 $\frac{1}{2} \times 8 \times 4 = 16$ M1 their '16' $\times 3$
6		3 3 AO1.3b	B1 for 13 in 'intersection' B1 for (16 – their '13') in 'Cat' B1 for sum of 8 + their three numbers = 30
7 (a)	60 50	2 1 AO1.3a 1 AO3.1a	B1 for each
(b)	2	2 1 AO1.3a 1 AO3.1a	M1 for 8 seen

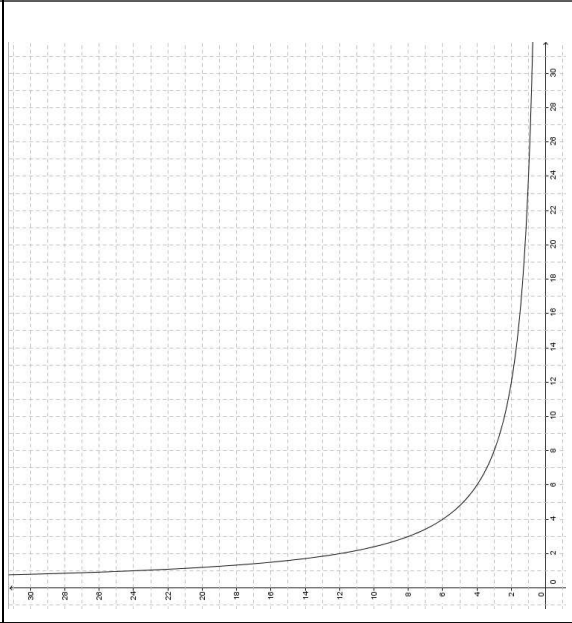
Question	Answer	Marks	Part marks and guidance
8	70 The triangle is isosceles so the missing angle is $x$ (may be on diagram) <b>oe</b> Angles in a triangle sum to $180^\circ$ <b>oe</b> (may be indicated by summing of angles to $180$ <b>oe</b> )	3 1 AO1.3a 1 AO2.4a 1 AO3.1b	B1 for each
9 (a)	100	1 1 AO2.1a	
(b)	10	1 1 AO2.1a	
(c)	One and a quarter boxes drawn	3 1 AO1.3a 1 AO2.3b 1 AO3.1c	M2 for 50 or M1 for 310 or M1 FT from subtraction
10 (a) (i)	>	1 1 AO1.2	
(ii)	<	1 1 AO1.2	
(iii)	>	1 1 AO1.2	
(b)	2500 <b>oe</b>	2 1 AO1.2 1 AO1.3a	M1 for 25 or 100
11	Correct reasoning	2 1 AO1.3a 1 AO2.2	M1 for $4a + 12 - 3a \pm 6$

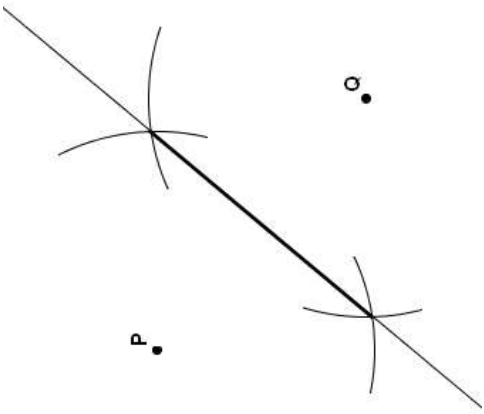
Question	Answer	Marks	Part marks and guidance
12 (a)		<b>2</b> 1 AO2.1a 1 AO2.3b	<b>B1</b> 4 × 4 dotted squares correct <b>B1</b> 4 blocks of 4 black squares correct
(b)	64	<b>2</b> 1 AO1.3a 1 AO2.1a	<b>M1</b> 8 × 8 or 8 <sup>2</sup> or 8 squared
(c)	4n	<b>2</b> 1 AO1.3a 1 AO2.3a	<b>M1</b> 4 8 12 seen
(d)	Completely correct proof including reasoning	<b>6</b> 2 AO2.2 4 AO2.4b	<b>B1</b> “blacks always even” + <b>B1</b> reason <b>B1</b> “dotted alternate odd and even” + <b>B1</b> reason <b>B1</b> even + even = even <b>B1</b> odd + even = odd  If zero scored <b>B1</b> shows true for patterns 1, 2 and 3 <b>B1</b> shows true for at least two more patterns

Accept “because × 4” or “4 is even”  
Accept any reason that has explanatory value



Question	Answer	Marks	Part marks and guidance	
13 (a) (i)	Any straight line through the origin e.g. 	<b>2</b> 1 AO1.1 1 AO2.3b	<b>B1</b> for a straight line	
(ii)		<b>2</b> 1 AO1.1 1 AO2.3b	<b>B1</b> for a cubic with two turning points	
(b) (i)	At least one point plotted correctly	<b>1</b> 1 AO2.3b		

Question	Answer	Marks	Part marks and guidance
(ii)		<b>3</b> 1 AO2.3b 1 AO3.1b 1 AO3.2	<b>B2</b> for at least 5 points correctly plotted OR <b>B1</b> for at least 3 points correctly plotted AND <b>B1</b> for <u>curve</u> drawn through <i>their</i> points
<b>14</b> (a)	£20 000	<b>1</b> 1 AO1.3a	
(b)	£14 580 or £14 600	<b>2</b> 2 AO1.3a	<b>M1</b> for $20\,000 \times 0.9^3$
(c)	7 years	<b>2</b> 1 AO1.3a 1 AO3.1c	<b>M1</b> for 2 trials shown
<b>15</b>	25, 30, 17	<b>5</b> 2 AO1.3a 2 AO3.1d 1 AO3.3	<b>M1</b> for any two consistent expressions, e.g. $x - 8, x$ <b>M1</b> for $x - 8 + x + x + 5 = 72$ <b>oe</b> <b>A1</b> for $x = 25$ <b>B1</b> for Kieran 25 or Jermaine 30 or Chris 17

Question	Answer	Marks	Part marks and guidance
16 (a)	140 – 160 (s)	3 1 AO1.3a 1 AO3.1d 1 AO3.2	B1 300 ± 20 (m) M1 for $\frac{\text{their '300'}}{2}$
(b)	Correct location for F	2 1 AO1.3a 1 AO3.1d	B1 angle $55^\circ \pm 2^\circ$ B1 distance 8 cm ± 0.2
(c)		4 1 AO1.3b 1 AO2.3b 2 AO3.1d	B1 perpendicular bisector of PQ drawn ± 2° B1 for arcs seen B1 arc centre P, radius 4 ± 0.2 cm B1 correct line segment marked FT their constructions
17 (a)	E	1 1 AO1.3a	
(b)	C and D	2 2 AO1.3a	B1 for each

Question	Answer	Marks	Part marks and guidance
18	<p>Average speed = <math>\frac{\text{Distance}}{\text{Time}} = \frac{x}{5}</math> km/h</p> <p>= <math>\frac{1000x}{60^2 \times 5}</math> m/s</p> <p>= <math>\frac{1000x}{18000}</math> m/s <b>oe</b></p> <p>= <math>\frac{x}{18}</math> m/s</p>	<p>4</p> <p>2 AO1.3a</p> <p>2 AO2.2</p>	<p><b>B1</b> for <math>x</math> km = <math>1000x</math> m</p> <p><b>B1</b> for 5 hours = <math>60^2 \times 5</math> s</p> <p><b>B1</b> for working to given answer without intermediate expression or statement of formula</p>
19	£25	<p>5</p> <p>2 AO1.3b</p> <p>3 AO3.1d</p>	<p>Alternative method:</p> <p>M1 for 2 : 3 = 20 litres red : 30 litres white</p> <p>M1 for <math>2 \times \text{£}80 + 3 \times \text{£}5 = \text{£}175</math></p> <p>M1 for <math>\frac{\text{their '175'}}{5} = 35</math></p> <p>M1 for 60 – their '35'</p> <p><b>M1</b> for <math>10 \times \frac{2}{5} = 4</math> litres red</p> <p>or</p> <p><math>10 \times \frac{3}{5} = 6</math> litres white</p> <p><b>M1</b> for red costs £8 per litre</p> <p>or</p> <p>white costs £0.50 per litre</p> <p><b>M1</b> for cost of one 10-litre can is their '4' × their '8' + their '6' × their '0.5'</p> <p><b>M1</b> for 60 – their '35'</p>
20	2.8(0...)	<p>3</p> <p>1 AO1.1</p> <p>2 AO1.3a</p>	<p><b>B1</b> for <math>\tan \theta = \frac{\text{opp}}{\text{adj}}</math></p> <p><b>M1</b> for <math>4 \times \tan 35</math></p>

Question	Answer	Marks	Part marks and guidance
21	0.82 oe	<b>4</b> 1 AO1.3a 3 AO3.1d	<b>M3</b> for $0.7 \times 0.4 + 0.7 \times 0.6 + 0.3 \times 0.4$ or $1 - 0.18$ Or <b>M2</b> for two correct products Or <b>M1</b> for one correct product or $0.3$ and $0.6$ seen (may be on a tree diagram or equivalent)

## Assessment Objectives (AO) Grid

Question	AO1	AO2	AO3	Total
1(a)	2			2
1(b)	2			2
1(c)	2			2
2	2			2
3	1		2	3
4(a)(i)	1			1
4(a)(ii)	1			1
4(a)(iii)	1			1
4(b)		3		3
5	1		2	3
6	3			3
7(a)	1		1	2
7(b)	1		1	2
8	1	1	1	3
9(a)		1		1
9(b)		1		1
9(c)	1	1	1	3
10(a)(i)	1			1
10(a)(ii)	1			1
10(a)(iii)	1			1
10(b)	2			2
11	1	1		2
12(a)		2		2
12(b)	1	1		2
12(c)	1	1		2
12d		6		6
13(a)(i)	1	1		2
13(a)(ii)	1	1		2
13(b)(i)		1		1
13(b)(ii)		1	2	3
14(a)	1			1
14(b)	2			2
14(c)	1		1	2
15	2		3	5
16(a)	1		2	3
16(b)	1		1	2
16(c)	1	1	2	4
17(a)	1			1
17(b)	2			2
18	2	2		4
19	2		3	5
20	3			3
21	1		3	4
<b>Totals</b>	<b>50</b>	<b>25</b>	<b>25</b>	<b>100</b>