OCR
Oxford Cambridge and RSA

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Date – Morning/Afternoon

GCSE (9-1) MATHEMATICS

J560/02 Paper 2 (Foundation Tier)

PRACTICE PAPER (SET 2) MARK SCHEME

Duration: 1 hour 30 minutes

MAXIMUM MARK 100

DRAFT

This document consists of 11 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, i.e. 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 (i.e. **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)		$\frac{63}{100}$ $\frac{7}{100}$, 7% 0.8[0] 80%	**3** **3 AO1.3a**	**B1** for $\frac{63}{100}$ **B1** for two or three correct in second and third lines	
	(b)		1.08, 1.5, 17.06, 17.3	**1** **1 AO1.3a**		
	(c)	(i)	$2\frac{3}{4}$ or $\frac{11}{4}$ or 2.75	**1** **1 AO1.3a**		
		(ii)	$2\frac{6}{7}$	**2** **2 AO1.3a**	**M1** for $\frac{20}{7}$ **oe**	
2	(a)	(i)	23	**1** **1 AO2.1b**		
		(ii)	15	**1** **1 AO2.1b**		
	(b)	(i)	6, 3	**1** **1 AO1.3a**		
		(ii)	5, 14	**1** **1 AO1.3a**	Following no marks in part **(b)** **SC1** for first term correct in each part	
3			9	**4** **1 AO1.3b** **2 AO3.1d** **1 AO3.3**	**B2** for 17 games won Or **M1** for 51 ÷ 3 AND **M1** for 32 – (6 + *their* '51 ÷ 3')	
4	(a)		1, 2, 4, 5, 10, 20	**2** **2 AO1.3a**	**B1** for four correct	

Question			Answer	Marks	Part marks and guidance	
	(b)		Valid reason	**1** **1 AO2.4a**		e.g. prime numbers only have one and themselves as factors
	(c)		Square numbers have an odd number of factors	**1** **1 AO2.5a**	Can be given as a counterexample e.g. factors of 9 are 1, 3, 9	
5	**(a)**		30 and 42	**2** **1 AO1.3a** **1 AO3.1a**	**M1** for equivalent ratio to 5 : 7 **soi**	
	(b)		13 and 7 and 7	**2** **1 AO1.3a** **1 AO3.1a**	**M1** for two of three numbers given as 7 or for three numbers that total 27	
6	**(a)**	**(i)**	341.54	**1** **1 AO1.3a**		
		(ii)	300	**1** **1 AO1.3a**		
	(b)		6 or 6.6	**2** **2 AO1.3a**	**M1** for $\frac{30\times4}{20}$ or $\frac{33\times4}{20}$	
7	**(a)**		8	**1** **1 AO1.2**		
	(b)		Harvey should have multiplied 4 by 9 6	**1** **1** **1 AO1.2** **1 AO3.4a**	**soi**	
8	**(a)**		Correct pie chart labelled appropriately	**4** **2 AO1.3a** **2 AO2.3b**	**B1** for correct 90° sector **M1** for 144[° ± 2] or 54[° ± 2] **soi** **B1** for correct labelling	90°, 144°, 54°, 72° Accuracy – each sector ± 2° Only 3 sectors need to be 'correct'
	(b)		$\frac{1}{5}$ or $\frac{72}{360}$ **oe**	**1** **1 AO2.3a**	FT from $\frac{\textit{their}\text{ angle}}{360}$ [± 2°]	

Question			Answer	Marks	Part marks and guidance	
9	(a)		4.85	**1** **1 AO1.3a**		
	(b)	(i)	45	**2** **2 AO1.3a**	**M1** for 25 ÷ 10 × 18 **soi** Or **B1** for [SF] 2.5	
		(ii)	27.5	**2** **2 AO1.3a**	**M1** for 10 km is 6.25 [miles] **soi** or 4 km is 2.5 [miles] **soi** or 1 km is 0.625 [miles] **soi**	
10	(a)		35	**2** **2 AO1.3a**	**M1** for [total] 9 [parts] **soi**	
	(b)	(i)	36	**2** **2 AO1.3a**	**M1** for 54 ÷ 6 × 4 **soi**	
		(ii)	$\frac{11}{21}$ **oe**	**1** **1 AO1.3a**		
	(c)		$\frac{x}{x+y}$	**2** **1 AO3.1b** **1 AO3.2**	**M1** for fraction with x as the numerator or $x + y$ **seen**	
11	(a)		Valid assumption	**1** **1 AO2.5b**		e.g. his speeds are constant e.g. he changes speed instantaneously at the changeovers
	(b)		5	**1** **1 AO2.3a**		
	(c)		40	**1** **1 AO2.3a**		

Question			Answer	Marks	Part marks and guidance	
	(d)		30	**3** **1 AO2.3a** **1 AO3.1c** **1 AO3.3**	**M1** for 20 km in 40 minutes **M1** for $20 \div \frac{2}{3}$ **oe** or some equivalent distance/time that may lead to the answer	e.g. 60 km in 120 minutes or $\frac{1}{2}$ km per minute
12	**(a)**		144	**3** **1 AO1.3a** **1 AO3.1d** **1 AO3.2**	**M2** for $60 \div 2.5 \times 6$ **oe** Or **B1** for 12 miles in half an hour or 24 miles in an hour	
	(b)		3	**2** **2 AO1.3a**	**M1** for $xy = 60$ **soi**	
13			45	**5** **1 AO1.3b** **2 AO3.1d** **2 AO3.2**	**B2** for 0.9 [m^3] or 1.2 [m^3] Or **M1** for $2 \times 1.5 \times 0.3$ or $2 \times 1.5 \times 0.4$ AND **M1** for *their* '0.9' [m^3] = 900 [litres] **M1** for *their* 'volume' ÷ 20	
14	**(a)**		Tree diagram completed correctly	**2** **2 AO2.3b**	**B1** for Josef loses $\frac{3}{7}$ or Clare loses $\frac{2}{5}$ **seen** on tree diagram	
	(b)		$\frac{12}{35}$	**2** **2 AO1.3a**	**M1** for $\frac{4}{7} \times \frac{3}{5}$	
	(c)		$\frac{17}{35}$	**3** **2 AO1.3a** **1 AO2.3a**	**M2** for $\frac{4}{7} \times \frac{2}{5} + \frac{3}{7} \times \frac{3}{5}$ **oe** Or **M1** for $\frac{4}{7} \times \frac{2}{5}$ or $\frac{3}{7} \times \frac{3}{5}$ **oe**	

Question			Answer	Marks	Part marks and guidance	
15	(a)		a^5b^4	1 1 AO1.3a		
	(b)		$(x-6)(x+6)$	1 1 AO1.3a		
	(c)	(i)	$(x-5)(x+3)$	2 2 AO1.3a	**M1** for sum of two constant terms is $^-2$ or product of two constant terms is $^-15$	
		(ii)	5 or $^-3$	1 1 AO1.3a	FT from linear expressions in *their* **(c)(i)**	
16			15 000	3 3 AO1.3b	**M2** for $18\,000 \div \frac{100+20}{100}$ **oe** Or **M1** for 18 000 associated with (100 + 20)%	
17	(a)	(i)	Triangle at ($^-6$, $^-3$), ($^-6$, $^-5$), ($^-2$, $^-5$)	2 2 AO2.3b	**B1** for correct reflection in $x = 0$ or reflection in $y = k$	
		(ii)	Triangle at (5, 2), (5, 6), (3, 6)	2 2 AO2.3b	**B1** for correct orientation and size but incorrect position or correct anticlockwise rotation about (0, 0) by 90°	
	(b)	(i)	Translation $\begin{pmatrix} 8 \\ -6 \end{pmatrix}$	2 1 AO2.1a 1 AO2.3b	**B1** for either	More than one transformation given spoils all marks
		(ii)	Enlargement [SF] $\frac{1}{2}$ **oe** [Centre] (2, 3)	3 1 AO2.1a 2 AO2.3b	**B1** for each	More than one transformation given spoils all marks

Question			Answer	Marks	Part marks and guidance	
	(c)		Incorrect with correct example	**1** **1 AO2.5a**		e.g. enlargement gives a similar shape Accept stretch, shear also
18			3, 12 and 12	**6** **1 AO1.3b** **1 AO2.1a** **2 AO3.1d** **2 AO3.2**	**B1** for 3 AND **B5** for 12 and 12 OR **M2** for $x = 150$ Or **M1** for $x + x + 60 = 360$ AND **M2** for $360 \div (180 - \textit{their } x)$ **oe** dependent on previous **M1** Or **M1** for $360 \div n$ $(0 < n < 180)$ or for $180 - \textit{their } x$	
19			128	**6** **1 AO1.3b** **2 AO3.1b** **2 AO3.2** **1 AO3.3**	**M2** for $(48 \div 2) \div 3 \times 2$ **oe** Or **M1** for $(48 \div 2) \div 3$ AND **A1** for 8 **A1** for 16 **M1** for 8×16	Alternative method: **B4** for $x = 3$ OR **M1** for $2(x + 5) + 4(x + 5) = 48$ **M1** for correct collection to $ax + b = 48$ **oe** (FT *their* equation in *x)* **M1** for $(48 - \textit{their } b)/a$ (FT *their* $ax + b = 48$) After **0** scored, **SC1** for use of two other variables in ratio 1 : 2 AND **B1FT** for $2(\textit{their } x + 5)(\textit{their } x + 5)$ evaluated (FT *their* solution for *x*)

Assessment Objectives (AO) Grid

Question	AO1	AO2	AO3	Total
1(a)	3	0	0	3
1(b)	1	0	0	1
1(c)(i)	1	0	0	1
1(c)(ii)	2	0	0	2
2(a)(i)	0	1	0	1
2(a)(ii)	0	1	0	1
2(b)(i)	1	0	0	1
2(b)(ii)	1	0	0	1
3	1	0	3	4
4(a)	2	0	0	2
4(b)	0	1	0	1
4(c)	0	1	0	1
5(a)	1	0	1	2
5(b)	1	0	1	2
6(a)(i)	1	0	0	1
6(a)(ii)	1	0	0	1
6(b)	2	0	0	2
7(a)	1	0	0	1
7(b)	1	0	1	2
8(a)	2	2	0	4
8(b)	0	1	0	1
9(a)	1	0	0	1
9(b)(i)	2	0	0	2
9(b)(ii)	2	0	0	2
10(a)	2	0	0	2
10(b)(i)	2	0	0	2
10(b)(ii)	1	0	0	1
10(c)	0	0	2	2
11(a)	0	1	0	1
11(b)	0	1	0	1
11(c)	0	1	0	1
11(d)	0	1	2	3
12(a)	1	0	2	3
12(b)	2	0	0	2
13	1	0	4	5
14(a)	0	2	0	2
14(b)	2	0	0	2
14(c)	2	1	0	3
15(a)	1	0	0	1
15(b)	1	0	0	1
15(c)(i)	2	0	0	2
15(c)(ii)	1	0	0	1
16	3	0	0	3
17(a)(i)	0	2	0	2
17(a)(ii)	0	2	0	2
17(b)(i)	0	2	0	2
17(b)(ii)	0	3	0	3
17(c)	0	1	0	1
18	1	1	4	6
19	1	0	5	6
Totals	50	25	25	100