AQA

GCSE
MATHEMATICS

2023 PRACTICE PAPER SET 3 Foundation Tier Paper 2

Mark Scheme

8300/2F

Version 1.1

Principal Examiners have prepared these mark schemes for specimen papers. These mark schemes have not, therefore, been through the normal process of standardising that would take place for live papers.

Further copies of this Mark Scheme are available from aqa.org.uk

Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.
3.14 …	Allow answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

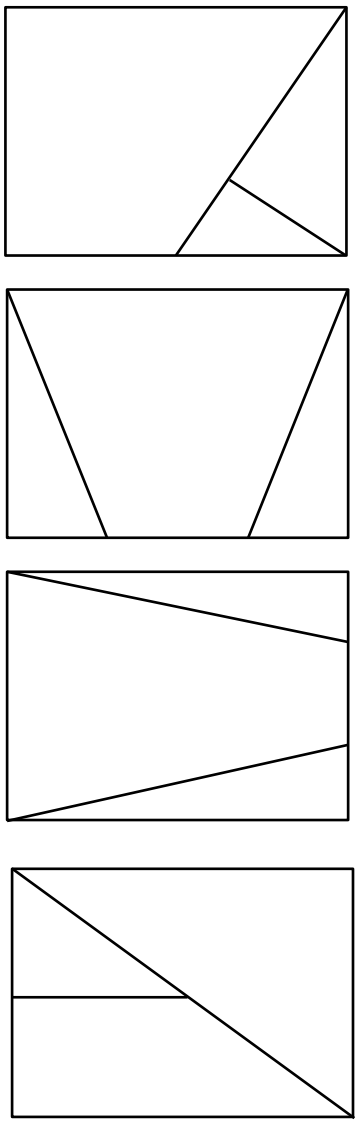
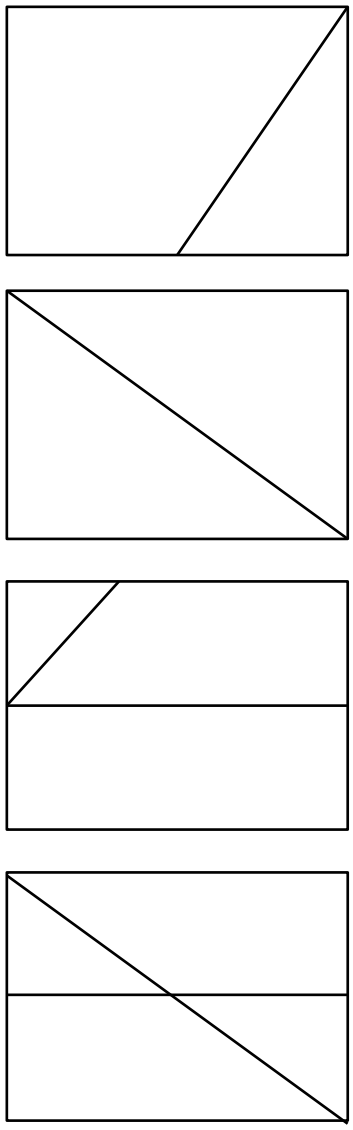
Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Q	Answer	Mark	Comments
1	1 or 8	B1	
2(a)	Radius	B1	
2(b)	Kite	B1	
3	–5	B1	
4	grams	B1	ignore any numerical values given accept g, ounces or oz
5(a)	121	B1	
5(b)	1023	B1	
6	West or W	B1	Accept East clearly identified as the answer on the diagram unless contradicted by answer line
7(a)	$4a$	B1	
7(b)	bc	B1	
7(c)	$2d + 6$	B2	B1 for $2d$ or $(+)$ 6 Do not ignore further work for B2
	Additional Guidance		
	$6 + 2d$	B2	
	$2d + 6 = 8d$	B1	
7(d)	$5(x + 2)$	B2	oe B1 for $5(\ldots)$ or $(x + 2)$

Q	Answer	Mark	Comments
8	$2 \times 2.5(0)$ or 5(.00)	M1	
	$0.3 \times$ their 5 or 1.5 or $1 - 0.3$ or 0.7 or $100 - 30$ or 70	M1	oe
	their 5 – their 1.5 or their 0.7×5 or 3.5	M1dep	oe dep on 2nd M1
	3.50	A1	
9	1 2 3 4 6 9	M1	at least the first four values or the last four values in the correct order
	3.5	A1	
10	(£)1287.23	B1	
	(£)1174.83	B1	
	(£)1032.94	B1ft	ft their (£)1174.83 – 141.89
11	$96 \div 4$ or 24	M1	
	their 24×3 or $96 -$ their 24 or 72	M1dep	
	their 24×5.5 or 132	M1	
	their $72 \times (5.5 \times 2)$ or their 72×11 or 792	M1	their 72 cannot be 132
	924	A1	

Q	Answer	Mark	Comments
12	**Alternative method 1**		
	200 × 0.17 or 2 × 17 or 34 or 1.17 seen	M1	oe
	234	A1	
	Alternative method 2		
	200 ÷ 10 + 200 ÷ 10 ÷ 2 + 200 ÷ 100 × 2	M1	oe
	234	A1	

13	3, 4, 5, 6, 7	B2	B1 for all five correct and one incorrect or four correct or four correct and one incorrect
	Additional Guidance		
	3, 4, 5, 6, 7, 8		B1
	3, 4, 5, 6		B1

Q	Answer	Mark	Comments
14	Fully correct diagram with one trapezium and two right-angled triangles Examples of fully correct answer 	B2	Mark intention B1 One trapezium or two right-angled triangles B1 examples 
	Additional Guidance		
	Drawing both diagonals of the rectangle scores zero Using more than two lines can score B1 If the answer diagram is blank, mark the practice diagram		

Q	Answer	Mark	Comments
15(a)	180 – 100 or 80 or 180 – 40 – (180 – 100) or 180 – 40 – 80 or 100 – 40	M1	
	60	A1	
15(b)	It is smaller than the answer to part **(a)**	B1	
16(a)	160	B1	
16(b)	Correctly totals two readings for the same day	M1	May be on the diagram eg Friday 140 + 200 = 340 Saturday 172 + 180 = 352
	Saturday	A1	
	Additional Guidance		
	Tuesday 140 + 172 = 312 Wednesday 120 + 130 = 250 Thursday 124 + 160 = 284		
16(c)	Chooses Monday or Wednesday with a valid reason	B2ft	eg Monday has the lowest profit for a single day (week 1) Wednesday has the lowest total profit (over the two weeks) ft for B2 ft for B2 totals for all five missing days given in (b) and the day with the lowest total chosen B1 for Monday or Wednesday with unclear reason

Q	Answer	Mark	Comments
16(d)	No and valid reason	B2	eg Broken (axis) 200 is not double 140 $140 \times 2 = 280$ and $200 \div 2 = 100$ B1 for 140 and 200 seen or $140 \times 2 = 280$ or $200 \div 2 = 100$ or 60 more
	Additional Guidance		
	No and no reason		B0
17(a)	$\frac{16}{20}$ or 6×7.5 or 45	M1	oe
	their $\frac{16}{20} \times 6 \times 7.5$ or their $45 \times \frac{16}{20}$ or 6×6	M1	oe
	36	A1	
17(b)	Use more dots	B1	Allow smaller dots to imply more dots
	Additional Guidance		
	Repeat the experiment		B0

Q	Answer	Mark	Comments
18(a)	**Alternative method 1**		
	27 576 × 24 or 661 824	M1	
	their 661 824 ÷ 42 600 or 15.5…	M1	
	15	A1	
	Alternative method 2		
	42 600 ÷ 27 576 or 1.54…	M1	
	24 ÷ their 1.54… or 15.5…	M1	
	15	A1	
	Alternative method 3		
	27 576 ÷ 42 600 or 0.647…	M1	
	their 0.647 × 24 or 15.5…	M1	
	15	A1	
18(b)	**Alternative method 1**		
	27 576 ÷ 60 ÷ 60 or 7.66	M1	
	their 7.66 × 1000	M1dep	
	7660	A1	
	Alternative method 2		
	27 576 × 1000 or 27 576 000	M1	
	their 27 576 000 ÷ 60 ÷ 60	M1dep	
	7660	A1	
	Alternative method 3		
	1000 ÷ (60 × 60) or 0.277… or 0.28	M1	
	their 0.277… × 27 576	M1dep	
	7660	A1	

Q	Answer	Mark	Comments
19	Any valid statement about the coefficient	B1	eg 8 should be 12 he has added 6 and 2 (instead of multiplying) he should have multiplied 6 and 2
	Any valid statement about the power	B1	eg 20 should be 9 he has multiplied 5 and 4 (instead of adding) he should have added 5 and 4
	Additional Guidance		
	$12n^9$ identified as the correct answer		B1B1
	It should be 12 and 9		B1
	It should be $12n^{20}$		B1
	It should be $8n^9$		B1
	It should be 12		B0
	It should be 9		B0
20(a)	$x^2 - 3x + 6x - 18$	M1	Allow one error
	$x^2 + 3x - 18$	A1	
20(b)	9 and -4	B1	
21	3 (×) 75 or 5 (×) 45 or 3 (×) 3 (×) 25 or 5 (×) 5 (×) 9 or 3, 3, 5, 5	M1	May be seen on a factor tree
	$3 \times 3 \times 5 \times 5$ or $3^2 \times 5^2$	A1	In any order oe ie $3 \times 3 \times 5^2$ $3^2 \times 5 \times 5$

Q	Answer	Mark	Comments
22(a)	$\frac{4}{3} \times \pi \times 3 \times 3 \times 3$	M1	oe
	[113, 113.1] or 36π	A1	
22(b)	$\frac{4}{3} \times \pi \times 3 \times 3 \times 3 \times 5.2$ or their [113, 113.1] × 5.2 or $36\pi \times 5.2$	M1	oe ft their **(a)**
	[588.10, 588.12] or $\frac{936}{5}\pi$ or 588(.1…)	A1ft	oe ft their **(a)**
23(a)	£2500 × 1.029^3	B1	
23(b)	**Alternative method 1**		
	[2723.86, 2723.90]	B1ft	ft their part **(a)**
	2500 × 1.035 or 2587.5(0)	M1	oe
	2500 × 1.035 × 1.023 × 1.023 or 2587.5(0) × 1.023 × 1.023 or [2707.89, 2707.9(0)]	M1dep	oe
	[2723.86, 2723.90] and [2707.89, 2707.9(0)] and Daniel's.	A1ft	oe ft their part **(a)**
	Alternative method 2		
	1.029^3 or 1.089(547) or 1.090	M1	
	1.035 or 1.023^2 seen	M1	
	1.035 × 1.023^2 or 1.083(1575…)	M1dep	
	1.089(547) and 1.083 and Daniels	A1	

Q	Answer	Mark	Comments
23(b) cont	**Additional Guidance**		
	Note incorrect answers from part **(a)** for Alt 1 £2500 × 2.9 × 3 = £21750 £2500 × 2.9^3 = £60972.5(0) £2500 × 1.029 × 3 = £7717.5(0)		
24	**Alternative method 1**		
	States or implies that 5 in the ratio for triangle A translates to five eighths of 180. and States or implies that 5 in the ratio for triangle B translates to five twelfths of 180. No as the fractions are not equal.	B2	B1 for States or implies that 5 in the ratio for triangle A translates to five eighths of 180. or States or implies that 5 in the ratio for triangle B translates to five twelfths of 180.
	Alternative method 2		
	180 ÷ (1 + 2 + 5) × 5 = 112.5 or 180 ÷ 8 × 5 = 112.5 and 180 ÷ (3 + 4 + 5) × 5 = 75 or 180 ÷ 12 × 5 = 75 and No	B2	B1 for 180 ÷ (1 + 2 + 5) × 5 = 112.5 or 180 ÷ 8 × 5 = 112.5 or 180 ÷ (3 + 4 + 5) × 5 = 75 or 180 ÷ 12 × 5 = 75
	Alternative method 3		
	22.5° and 45° and 112.5° and 45° and 60° and 75° and No		B1 for 22.5° and 45° and 122.5° or 45° and 60° and 75°

Q	Answer	Mark	Comments
25(a)	$y = 2x + 1$	B2	B1 for $2x + c$ or $mx + 1$ or gradient = 2 oe
25(b)	(0, –2)	B2	B1 for each coordinate or for reverse coordinates or $y = -2$ seen or for $y = 2x + c$ or gradient = 2
26	55 × 1 or 55 or 70 × 6 or 420 or 90 × 13 or 1170	M1	
	their 55 + their 420 + their 1170 or 1645	M1dep	sum of fx
	their 1645 ÷ 20 or 82.25	M1dep	
	82.25 and correct conclusion	A1	oe eg 82.25 and men were faster.
	Additional Guidance		
	1645 ÷ 3 = 548.3333		M1M1M0A0