GCSE
MATHEMATICS

2023 PRACTICE PAPER SET 2 Foundation Tier Paper 1

Mark Scheme

8300/1F

Version 1.0

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	Any multiple of 6, eg 6 or 12	B1	

Q	Answer	Mark	Comments
2	Any two numbers where the first number is less than the second	B1	eg 3 and 5

Q	Answer	Mark	Comments
3	12	B1	

Q	Answer	Mark	Comments
4	y^2	B1	

Q	Answer	Mark	Comments
5(a)	$65 \div 5$	M1	
	13	A1	
5(b)	Attempts $3.4 \div 2$ first or 1.7	M1	
	6.5	A1	SC1 0.5

Q	Answer	Mark	Comments
6	$10a + b$	B2	Condone $1b$ for b B1 $10a$ or b

Additional Guidance

Do **not** ignore further work for B2 eg $10a + b = 11ab$	B1

Q	Answer	Mark	Comments
7	Fully correct Gold ☐☐ Silver ☐☐☐☐ Bronze ☐☐◩	B3	B2 for 2 rows correct including Bronze B1 for 1 row correct SC1 for pictogram with symbols in correct ratio eg 4 squares on 1st row, 8 squares on 2nd row and 5 squares on 3rd row

Additional Guidance

Accept any division for half a square eg a diagonal	

Q	Answer	Mark	Comments
8(a)	9	B1	
8(b)	19 + 1 or 20	M1	
	10	A1	SC1 10.5

Q	Answer	Mark	Comments
9(a)	$\dfrac{6}{7}$	B1	
9(b)	$\dfrac{3}{8} \times \dfrac{10}{7}$	M1	
	$\dfrac{30}{56}$ or $\dfrac{15}{28}$	A1	

Q	Answer	Mark	Comments
10(a)	6×2 or 12 and 3×-1 or –3	M1	oe
	9	A1	
10(b)	80	B1	

Q	Answer	Mark	Comments
11(a)	10	B1	
11(b)	$2n + 2$	B1	
11(c)	Yes and valid reason	B1	eg $2(n + 1)$ $2n + 2$ is a multiple of 2 $2n + 2$ is divisible by 2 It is the 2 times table It is a multiple of 2 It starts even and then add 2 each time

Additional Guidance

Even + even = even	B1
Even + 2 = even	B1
Because you add 2 all the time	B0

Q	Answer	Mark	Comments
12	$\dfrac{1}{3}$	B1	

Q	Answer	Mark	Comments
13	$3x + 2x + 90 = 180$	M1	oe 54 and/or 36 in correct place on diagram
	$3x + 2x = 180 - 90$ or $5x = 90$	M1dep	oe Collecting terms
	18	A1	

Q	Answer	Mark	Comments
14	$63 \div 12$ or $5.2\ldots$ 5 r 3 or 5 or 12, 24, 36, 48, 60 and 72 seen	M1	oe
	$27 \div 8$ or $3.3\ldots$ 3 r 3 or 3 or 8, 16, 24 and 32 seen	M1	oe
	6 or 4	A1	From either M1
	10	A1	Condone 6 (for squash) and 4 (for coffee)

Q	Answer	Mark	Comments
15(a)	64 and 36	B2	Either order B1 for two square numbers with a total greater than 80 but not 100 or 8 and 6 or 8^2 and 6^2
15(b)	No and two square numbers correctly added to give an odd number	B1	eg No and $4 + 9 = 13$ No and $2^2 + 3^2 = 13$

Additional Guidance	
Even square + odd square = odd number (correctly evaluated) with No	B1
$4 + 9 = 13$ (Not stated No)	B0

Q	Answer	Mark	Comments
16	**Alternative method 1**		
	12 or 10 or 22	M1	
	44	A1	
	Alternative method 2		
	$6x - 10y$ or 24 or 20	M1	
	44	A1	

Q	Answer	Mark	Comments
17	$5(3x + y)$	B1	

Q	Answer	Mark	Comments
18(a)	2010	B1	
18(b)	2046	B1	
18(c)	Valid reason	B1	eg (20)22 + multiple of 8 can never be a multiple of 4 Always 2 years before (or after) a leap year

Additional Guidance

2022 is not a leap year and every 8 years	B1
22 is not divisible by 4	B0
Always between leap years	B0

Q	Answer	Mark	Comments
19(a)	$\dfrac{3}{5}$	B1	oe
19(b)	**Alternative method 1**		
	25 outcomes for 2 spins	M1	Implied by a probability with denominator 25 or by a 5 by 5 possibility space diagram
	One way of attaining 8	M1	eg in a possibility space diagram or sight of 4 + 4 or 1/5 seen twice
	$\dfrac{1}{25}$	A1	oe
	Alternative method 2		
	$\dfrac{1}{5}$, $\dfrac{1}{5}$	M1	oe
	$\dfrac{1}{5} \times \dfrac{1}{5}$	M1	oe
	$\dfrac{1}{25}$	A1	oe

Q	Answer	Mark	Comments
20(a)	88 + 92 (+18) or 180 (+18) or 198	M1	
	88 + 92 (+18) – 64 or 180 – 64 (+18) or 198 – 64	M1dep	oe $64 + x - 18 = 88 + 92$ oe
	134	A1	SC1 for 98

Q	Answer	Mark	Comments
20(b)	180 − 125 or 55	M1	
	125 ÷ 50 or 2.5 or 2 h 30 minutes	M1	oe
	their 55 ÷ 60 or 11/12 h or 55min	M1dep	Dependent on 1st M1 or subtracting 125 from their distance oe
	3 hours and 25 min	A1	205 mins

Q	Answer	Mark	Comments	
20(c)	(The journey will) take longer	B1	oe	
	Additional Guidance			
	More time			B1
	(The journey will) be slower			B0

Q	Answer	Mark	Comments	
21(a)	(The number of students that) Have both a cat and a dog	B1	oe eg 9 have both	
	Additional Guidance			
	They are in both sets			B1
21(b)	7 cats only	B1		
	8 dogs only	B1		
	6 neither	B1ft	Must ft from their Cats and Dogs	
	Additional Guidance			
	SC1 if all 4 entries add up to 30			

Q	Answer	Mark	Comments
22(a)	30 ÷ (7 + 3) or 3	M1	oe
	21	A1	

Q	Answer	Mark	Comments
22(b)	12 ÷ 3 or 4	M1	
	4 × 7 or 28	M1dep	
	40	A1	SC1 50

Q	Answer	Mark	Comments	
23	**Alternative method 1**			
	radius = 12 ÷ 4 or 3 or diameter = 12 ÷ 2 or 6 or 12 × 6 or 72	M1		
	π × their 3^2 or 9π	M1		
	$2 \times \pi \times$ their 3^2 or 18π	M1dep		
	$72 - 18\pi$	A1	Ignore attempts at factorisation Do not ignore further work	
	Alternative method 2			
	radius = 12 ÷ 4 or 3 or diameter = 12 ÷ 2 or 6 or 6 × 6 or 36	M1		
	π × their 3^2 or 9π	M1		
	$36 - 9\pi$	M1dep		
	$2(36 - 9\pi)$	A1	Ignore attempts at expansion Do not ignore further work	
	Additional Guidance			
	$72 - 18\pi = 54\pi$			M1M1M1A0
	$72 - 18\pi = 9(8 - 3\pi)$ (error in factorisation)			M1M1M1A1
	Accept 3.14 or better for π for method marks			

Q	Answer	Mark	Comments
24	$\dfrac{20}{32}$ or $\dfrac{15}{24}$	B1	oe 0.625 or 62.5%
	A correct probability from each bag, with attempt at a comparable form, with at least one correct	M1	eg denominator same for both $\dfrac{60}{96}$ twice , $\dfrac{5}{8}$ twice oe or 0.625 twice or 62.5% twice
	No ticked **AND** both probabilities correct and in the same format	A1	eg No both the same with the correct value given
	Additional Guidance		
	if same ratio (e.g. 5:3 or 3:5) seen for both and tick NO		B1M1A1

| **25** | 6.16×10^4 | B1 | |

| **26** | $\sqrt{30} > 5$ | B1 | oe
May be implied by numerator is negative |
| | negative ÷ positive = negative
and No | B1 | |

| **27** | $\dfrac{10}{100} \times 200\,000$ or $20\,000$

or $1.1 \times 200\,000$ or $220\,000$

or $1.1^2 \times 200\,000$ or $1.21 \times 200\,000$ | M1 | oe |
| | $242\,000$ | A1 | SC1 for $240\,000$ |

Q	Answer	Mark	Comments
28	A pair of intersecting arcs of equal radii from ends of line with two intersections	M1	oe
	Perpendicular line drawn through points of intersection	A1	1 mm tolerance

Q	Answer	Mark	Comments
29	$8^2 + 6^2$ or $64 + 36$ or 100	M1	
	$\sqrt{8^2 + 6^2}$ or $\sqrt{100}$	M1dep	oe
	$\sqrt{100} = 10 = $ diameter	A1	oe eg the diagonal of the rectangle is equal to the diameter two intersecting diagonals of length 10 cm touch the outside of circle so all rectangles whose diagonal is of length 10 cm can be cut from the circle