AQA

GCSE
MATHEMATICS

2023 PRACTICE PAPER SET 3 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	90%	B1	
2	Any multiple of 12	B1	
3(a)	4	B1	
3(b)	3 + 4 + 4 … or 48 and their 48 ÷ 8	M1	their 48 must be from a seen attempt to total the values
	6	A1	
4	350	B2	B1 Any indication of 100 cm in 1 m eg 3.5 × 100 or relationship stated
5	1489	B2	B1 for (1152 + 476 =) 1628 or (1152 − 139 =) 1013 or (476 − 139 =) 337 or their 1628 − 139 correctly evaluated or their 1013 + 876 correctly evaluated or their 337 + 7152 correctly evaluated

Q	Answer	Mark	Comments
6(a)	8.50 (pm) or 20.50	B1	oe 10 to 9 (pm)
	Additional Guidance		
	Allow colons, spaces, etc between hours and minutes		
6(b)	9.45 (pm) or 21.45	B2ft	oe quarter to ten (pm) ft their 8.50 (pm) B1 for their 8.50 + 20 minutes correctly evaluated or 9.10 (pm) or their 9.10 (pm) + 35 minutes correctly evaluated or (20 mins + 35 mins =) 55 minutes
	Additional Guidance		
	Allows colons, spaces, etc between hours and minutes		
	Answer to **(a)** 8.40 Answer to **(b)** 9.35		B2ft

Q	Answer	Mark	Comments
7(a)	Fully correct table | 14	19	25
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19	24	30
25	30	36		B2	B1 for 5 or more correct values in the correct places
7(b)	Identifies the square numbers in their completed table or lists the square numbers up to at least 36	M1	Any indication
	$\dfrac{3}{9}$ or $\dfrac{1}{3}$	A1ft	oe fraction, decimal or percentage ft their completed table Accept 0.33… Do **not** accept 0.3
	Additional Guidance		
	If there are no square numbers in their completed table award both marks for an answer of 0 oe		

Q	Answer	Mark	Comments
8(a)	Manchester	B1	
8(b)	Bristol and Plymouth	B1	Either order
8(c)	**Alternative method 1**		
	7 + 4 + 8 + 5 + 4 or 28 and 6 + 5 + 4 + 6 + 1 or 22	M1	Allow one incorrect value
	their 28 – their 22	M1dep	
	6	A1	
	Alternative method 2		
	7 – 6 or 1 and 4 – 5 or – 1 and 8 – 4 or 4 and 5 – 6 or – 1 and 4 – 1 or 3	M1	Allow one incorrect value
	their 1 + their (– 1) + their 4 + their (– 1) + their 3	M1dep	
	6	A1	
	Alternative method 3		
	13 + 9 + 12 + 11 + 5 or 50 and 7 + 4 + 8 + 5 + 4 or 28 or 6 + 5 + 4 + 6 + 1 or 22	M1	Allow one incorrect value
	their 28 – (their 50 – their 28) or (their 50 – their 22) – their 22	M1dep	
	6	A1	

Q	Answer	Mark	Comments
9(a)	11	B1	
9(b)	18	B1	

Q	Answer	Mark	Comments
10(a)	2.4(0) + 4.8(0) or 2.4 × 3 or 12 − 4.8 or 7.2	M1	Any correct calculation in pounds or pence that would give the cost of 3 plants
	7.20	A1	

Q	Answer	Mark	Comments
10(b)	Any combination of costs for more than 10 plants correctly evaluated or 52.8(0) ÷ 2.4(0) or 5280 ÷ 240 or 528 ÷ 24	M1	eg 15 plants oe
	22	A1	

Additional Guidance

The correct cost may come from adding values in the table, multiplying by 2.40 or subtracting values from £52.80

11 plants £26.40	15 plants £36.00	19 plants £45.60
12 plants £28.80	16 plants £38.40	20 plants £48.00
13 plants £31.20	17 plants £40.80	21 plants £50.40
14 plants £33.60	18 plants £43.20	

Condone missing £ signs or end 0s

Q	Answer	Mark	Comments
10(c)	4 : 5	B1	Must be in simplest form

Additional Guidance

Condone any units seen

eg £4 : £5 — B1

Q	Answer	Mark	Comments
11(a)	1.8×5	M1	
	9.00	A1	SC1 for 900 (unless £ crossed out and p used then M1A1)
11(b)	$1.8 \div 3$ or $0.6(0)$ or $180 \div 3$	M1	$3 \times 60 = 180$ $3 \times 0.6(0) = 1.8(0)$
	60	A1	

12	$r = p - 3$	B1	

13	80 or 10 or 40	M1	
	80 and 10 and 40 seen or $\dfrac{80 \times 10}{40}$ with two correct	M1	
	20 from correct approximations	A1	
	Additional Guidance		
	20 without correct approximations		M0M0A0

14	6	B2	B1 $x^2 = 9$
	Additional Guidance		
	Condone $(-3, 6)$ for B2		

15	No and 15 is half of 30, but 44 is less than half of 90 or No and 1320 and 1350	B2	oe B1 for 1320 or 1350 or No with an attempt to give reason
	Additional Guidance		
	No on its own		B0

Q	Answer	Mark	Comments
16(a)	$\dfrac{2}{10}$ (+) $\dfrac{7}{10}$	M1	oe fractions with a common denominator and at least one correct numerator
	$\dfrac{9}{10}$	A1	oe fraction eg $\dfrac{18}{20}$ SC1 0.9
16(b)	$\dfrac{3 \times 7}{5 \times 2}$ or $\dfrac{21}{10}$	M1	oe fraction eg $\dfrac{210}{100}$
	$2\dfrac{1}{10}$	A1	oe mixed number eg $2\dfrac{10}{100}$ SC1 2.1

17	**Alternative method 1**		
	5 ÷ 10 or 0.5 or 50(p) or 5.5(0)	M1	
	16 × their 5.5(0) or 88	M1dep	
	(25 − 16) × 5 or 9 × 5 or 45	M1	
	their 45 + their 88	M1dep	dep on M1M1M1 Must be consistent units.
	133(.00)	A1	
	Alternative method 2		
	5 ÷ 10 or 0.5 or 50(p) or 5.5(0)	M1	
	their 0.5(0) × 16 or 8	M1dep	
	25 × 5 or 125	M1	
	their 8 + their 125	M1dep	dep on M1M1M1 Must be consistent units.
	133(.00)	A1	

Q	Answer	Mark	Comments
18	$\dfrac{x}{7} = 4 + 3$ or $\dfrac{x}{7} = 7$ or $x - 3 \times 7 = 7 \times 4$ or $x - 21 = 28$	M1	$4 \to + 3 \to \times 7$ or $(4 + 3) \times 7$
	49	A1	

	Additional Guidance	
	$4 + 3 \times 7 = 25$	M0A0

	Alternative method 1		
	Plots (–1, 2) and (1, 6)	M1	Mark intention
	Fully correct ruled line through the correct points	A1	
	Draws the line $y = x$	B1	
	(–4, –4)	B1ft	ft their intersection

	Additional Guidance	
	Correct line drawn implies points (–1, 2) and (1, 6) are plotted	M1A1

	Alternative method 2		
19	Gradient $= \dfrac{6 - 2}{1 - (-1)}$ or $\dfrac{2 - 6}{-1 - -1}$ or 2	M1	oe Implied by the correct equation
	$(y =) \, 2x + 4$	M1dep	Correct function for their gradient
	their $2x + 4 = x$	M1	ft their function
	(–4, –4)	A1	

	Additional Guidance	
	$\dfrac{6 - 2}{1 - (-1)} = -2$ $y = -2x + 4$ $-2x + 4 = x$ $x = \dfrac{4}{3}$	M1 M1 M1 A0

Q	Answer	Mark	Comments
20(a)	$180 + 170 + 50$ or 400	M1	may be seen as the denominator
	$\dfrac{50}{400}$	A1	oe
20(b)	**Alternative method 1**		
	$16 \times \dfrac{50}{180 + 170 + 50}$ or $16 \times \dfrac{50}{400}$ or 2	M1	oe fraction, decimal or percentage $180 + 170 + 50$ may come from **(a)**
	Yes and 2	A1	
	Alternative method 2		
	$(180 + 170 + 50) \div 16$ or $400 \div 16$ or 25 and $50 \div$ their 25 or 2	M1	oe $180 + 170 + 50$ may come from **(a)**
	Yes and 2	A1	
	Alternative method 3		
	$(180 + 170 + 50) \div 50$ or $400 \div 50$ or 8 and $16 \div$ their 8 or 2	M1	oe $180 + 170 + 50$ may come from **(a)**
	Yes and 2	A1	

Q	Answer	Mark	Comments
21(a)	**Alternative method 1**		
	3.2 – 1.8 or 1.4	M1	
	7	A1	
	Alternative method 2		
	3.2 – at least five 0.2s or 1.8 + at least five 0.2s	M1	
	7	A1	
	Alternative method 3		
	3.2 ÷ 0.2 or 16 and 1.8 ÷ 0.2 or 9	M1	
	7	A1	
21(b)	It will take more days	B1	oe the answer would be higher eg it will be more than 7

<table>
<tr><td colspan="2" align="center">Additional Guidance</td></tr>
<tr><td>Slower/longer than 7 days</td><td>B1</td></tr>
<tr><td>Slower/longer alone</td><td>B0</td></tr>
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Q	Answer	Mark	Comments
22	$DAE = 180 - 68 - 82$ or 30 or $ABC = 68$ or $DAB = 82$ or $EDB = 180 - 68$ or 112 or $BAE = 180 - 68$ or 112	M1	may be on diagram in correct position
	$BAC = 180 - 68 - 68$ or 44 or $ADB = 112 - 82$ or 30 and $ACD = 112$ or $BAC = 44$, $BAE = 112$ and $ADB = 112 - 82$ or 30 or $CAE = 68$ and $DAE = 30$ or $DAB = 82$ and $BAC = 44$	M1	may be on diagram in correct position oe
	$82 - 44 = 38$ or $180 - 112 - 30 = 38$ or $112 - 44 - 30 = 38$ or $68 - 30 = 38$	A1	
	Additional Guidance		
	eg 112 or A = 44 is ambiguous Written work takes precedence over diagrams if contradictory.		M0

Q	Answer	Mark	Comments
23(a)	**Alternative method 1**		
	47 – 30 or 17 seen	M1	
	30 – 17 (= 13)	A1	
	Alternative method 2		
	$x + y = 30$ and $x + 2y = 47$	M1	oe equations
	Solves equations correctly obtaining $x = 13$	A1	
	Additional Guidance		
	If setting up two equations, they must be correct		
23(b)	$5 - x$	M1	second term
	$10 - x$	M1dep	fourth term
	$15 - x$	A1	

Q	Answer	Mark	Comments
24	$\sqrt{16} = 4$ or correctly evaluated example where the answer is a whole number	B1	eg $10^2 - 8^2 = 36$ and 36 is a square number or $10^2 - 8^2 = 6^2$ oe
	Correctly evaluated example where the answer is not a whole number	B1	eg $3^2 - 2^2 = 5$ and 5 is not a square number oe
	Two counter examples and tick The method will **sometimes** give an answer which is a whole number	B1	
	Additional Guidance		
	1 or 2 marks can be gained for example(s) even if the decision is incorrect		
	$3^2 - 2^2 = 5$ and 5 is between 4 and 9, implies 5 is not square		B0B0B1

Q	Answer	Mark	Comments
25(a)	$30 \div 40 \ (\times 60)$ or 45 min or $\frac{3}{4}$ h or $45 \div 50 \ (\times 60)$ or 54 min or $\frac{9}{10}$ h or $50 \div 60 \ (\times 60)$ or 50 min or $\frac{5}{6}$ h	M1	oe
	Two of $30 \div 40 \ (\times 60)$ or 45 min or $\frac{3}{4}$ h and/or $45 \div 50 \ (\times 60)$ or 54 min or $\frac{9}{10}$ h and/or $50 \div 60 \ (\times 60)$ or 50 min or $\frac{5}{6}$ h	M1	oe
	$30 \div 40 \ (\times 60)$ or 45 min or $\frac{3}{4}$ h and $45 \div 50 \ (\times 60)$ or 54 min or $\frac{9}{10}$ h and $50 \div 60 \ (\times 60)$ or 50 min or $\frac{5}{6}$ h	M1	oe
	(Route) 2 with all working correct	A1	oe
	Additional Guidance		
	Condone missing units, but note that 50 is given as both a distance and a speed in the question		

Q	Answer	Mark	Comments
25(b)	Time = 36 minutes or $\frac{3}{5}$ h or 18 minutes difference or scale factor $\frac{5}{3}$	B1	oe
	$45 \times \frac{5}{3}$ or $45 \div \frac{3}{5}$ or 75	M1	
	25 mph faster	A1	
	Additional Guidance		
	25 mph with no box ticked		B1M1A0
	25 mph with slower ticked		B1M1A0