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General Certificate of Secondary Education
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Mathematics 43603F

Unit 3 Foundation tier

Final

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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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.

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.
Q	Marks awarded for Quality of Written Communication
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, 3.149.
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 candidate has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the candidate. In cases where there is no doubt that the answer has come from incorrect working then the candidate should be penalised.

Questions which ask candidates to show working

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

Questions which do not ask candidates to show working

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

Misread or miscopy

Candidates often copy values from a question incorrectly. If the examiner thinks that the candidate 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.

Unit 3 Foundation Tier

Q	Answer	Mark	Comments
1a	40 millimetres	B1	
1b	5 grams	B1	
1c	40 centilitres	B1	
2a	*A* and *C*	B2	Any order B1 for 1 correct or 1 correct and 1 incorrect
2b	70 (%)	B2	B1 for $\frac{7}{10}$ or 0.7 or 0.70 or 7 out of 10 SC1 30%
3	Correct reflection	B2	B1 for any reflection in a vertical line or for three correct vertices
4	22 − 18 or 4	M1	
	18 − their 4 or 22 − 2 × their 4	M1	
	4 and 14	A1	SC1 for answer of 14 provided it does not come from incorrect working
5a	(5 × 5 =) 25 or (5^2 =) 25	M1	
	78.5(...)	A1	Accept 79 with working seen
5b	Divide by 3.14 or π Square root	B2	B1 for reversed order or one step only in correct position
6	Cuboid	B1	Do not accept: Cube
	(Square based) Pyramid	B1	
	(Triangular) Prism	B1	

Q	Answer	Mark	Comments
7a	21	B1	
7b	8	B1	
7c	34×2 or 14×5 or $42 \times 8 \div 5$ or 42×1.6	M1	Correct scaling
	[67, 70]	A1	
7d	$8 + 21$ or $8 + 8 + 13$ or $8 + 8 + 8 + 5$ or $18 \times 8 \div 5$ or 18×1.6 or $18 \div 3 \times 5$ or $34 - 5$	M1	Correct scaling
	[28, 30]	A1	
8a	Yes No No Yes	B3	B2 for 3 correct B1 for 2 correct
8b	2.7×1.5 or 4.05	M1	
	$2.7 \times 1.5 \times 36.3$ or 147.015	M1dep	
	147 or 147.01 or 147.02	Q1	Strand (i) Correct money notation Allow 147.00 SC2 217.80 or 181.50 SC1 217.8 or 181.5

Q	Answer	Mark	Comments
9a	3 shapes drawn with no overlap	B2	B1 for 2 shapes drawn with no overlap (ignore 3rd shape)
9b	Correct translation drawn	B1	
9c	$\begin{pmatrix} 5 \\ -6 \end{pmatrix}$ or 5 (squares) right and 6 (squares) down	B2	B1 for one part correct
10a	50	B1	
10b	27	B1	
10c	$180 - 90 - 58$ or $90 - 58$	M1	oe
	32	A1	
11	$11 \times 4 \times 4$	M1	oe
	176	A1	
	cm^3	B1	
12a	Vertical line with height [6.9, 7.1] cm marked Point marked [2.4, 2.6] cm on base line from RHS (or from base of wall) Correct ladder drawn	B2	B1 for first or second criterion met
12b	[7.2, 7.7]	B1ft	ft with a tolerance of ± 2.5 mm (0.25 cm)

Q	Answer	Mark	Comments
13a	70 × 737 or digits 5159 seen	M1	70 × their 737
	51 590 or 51 600 or 52 000	A1ft	ft their 737
	51.59(0) or 51.6 or 52	A1ft	ft their 51590 ÷ 1000
13b	70 ÷ 30 (× 60) or 70 ÷ 0.5	M1	0.5 litres per second 60 litres in 2 minutes 10 litres in 1/3 minute
	$\frac{7}{3}$ or $2\frac{1}{3}$ or 2.33(...) or 140 (seconds)	A1	e.g. 60 litres in 2 minutes and 10 litres in 1/3 minute
	2 minutes 20 seconds	A1	
14a	$x + 3$ or $3 + x$	B1	
14b	5 and 2	B2	Either order B1 for 1 correct or for 1 correct and 1 incorrect

Q	Answer	Mark	Comments
15	0.2×40 or $\frac{20}{100} \times 40$ or 8 or $\frac{80}{100} \times 40$	M1	oe 40 ÷ 50 (= 0.8) and 0.8×0.2 or 0.8×0.8
	32	A1	0.16
	50 ÷ their 32 or 80 ÷ 55 1.5(6...) or 1.4(5...) or their 32 ÷ 50 or 55 ÷ 80 or 0.64 or 0.68(75) or 0.69	M1	oe 0.8 – 0.16 or 0.64 or 50 ÷ 40 = 1.25 and 1.25 ÷ 0.8
	50 ÷ their 32 and 80 ÷ 55 or their 32 ÷ 50 and 55 ÷ 80 or their 32 ÷ 50 × 80 or 55 ÷ 80 × 50	M1dep	Attempt to match equal quantities or equal prices 0.8 – 0.16 and 55 ÷ 80 1.25 ÷ 0.8 and 80 ÷ 55
	1.5(6...) and 1.4(5...) 0.64 and 0.68(75) or 0.69 51(.2) 34(.375)	A1	ml per £ £ per ml 80 ml of small bottle 50 ml of large bottle
	Correct conclusion (Small bottle (50 ml) if correct)	Q1ft	Strand (iii) ft from their working Dependent on 2nd and 3rd method marks

Q	Answer	Mark	Comments
Alt15	0.2×40 or $\frac{20}{100} \times 40$ or 8 or $\frac{80}{100} \times 40$	M1	oe 40×8 (= 320) and 320×0.2 or 320×0.8
	32	A1	64
	their 32×8 or 55×5 or 256 or 275	M1	oe 320 – 64 or 256
	their 32×8 and 55×5	M1dep	Attempt to match equal quantities or equal prices
	256 and 275	A1	
	Correct conclusion	Q1ft	Strand (iii) ft from their working Dependent on 2nd and 3rd method marks
16a	20 000 ÷ 100	M1	
	200	A1	
16b	5.5 seen	B1	
	their 5.5×4 or their min $\times 4$	M1	Do not accept 6×4 $5.5 < \text{min} < 6$
	22	A1ft	SC2 for 26

Q	Answer	Mark	Comments
17	$3x$ or $2x$ seen for missing sides	B1	May be on diagram or in working
	$4x + 4x + 2x + 3x + 2x + x$ (= 56)	M1	oe $16x$ implies B1M1
	their $16x = 56$	M1	
	3.5 or $\frac{7}{2}$ or $3\frac{1}{2}$	A1ft	SC2 for $\frac{56}{11}$ or 5.09... or 5.1 SC2 for $\frac{56}{13}$ or 4.3... SC2 for 4 SC applies if method marks not awarded.
18	$2 \times \pi \times 4.2$ or $2 \times 3.14(\ldots) \times 4.2$	M1	
	[26.3, 26.4]	A1	
	26.4	B1ft	ft their 2 d.p. or more answer SC1 for 55.4
19	Other angle of 70 seen or $B = 90$	M1	Angles seen on diagram must be in the correct place
	$180 - 90 - 70$ or 20 seen or $DBC = 40$	M1	
	$90 - 20 - 20$ or $180 - 90 - 40$	M1dep	oe dependent on both previous M marks
	50	A1	
20	$13^2 + 6.5^2$ or 169 + 42.25	M1	211.25 or 211.3
	$\sqrt{13^2 + 6.5^2}$	M1dep	oe
	14.5(34…)	A1	Accept 15 with working