AQA Qualifications

GCSE
MATHEMATICS

Unit 2 43602F
Mark Scheme

43602F

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Mark schemes are prepared by the Lead Assessment Writer 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 associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' 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.

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.

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.

Q	Answer	Mark	Comments
1(a)	(5, 2)	B1	
1(b)	Point correctly indicated on grid at (1,2)	B1	
1(c)	$(a, 4)$ and $(b, 4)$ where a and b are two different numbers	B2	B1 one correct point SC1 line $y = 4$ drawn SC1 two correct points and no incorrect points marked on graph
2	1200 – 350	M1	
	850	A1	
	850 and Yes	Q1ft	Strand (iii) ft correct decision for their 850 with M1 awarded
	Alternative method 1		
	750 + 350	M1	
	1100	A1	
	1100 and Yes	Q1ft	Strand (iii) ft correct decision for their 1100 with M1 awarded
	Alternative method 2		
	1200 – 350 – 750	M1	
	100	A1	Condone 350 + 750 + 100 = 1200
	100 and Yes	Q1ft	Strand (iii) ft correct decision for their 100 with M1 awarded
	Alternative method 3		
	1200 – 750	M1	
	450	A1	Condone 750 + 450 = 1200
	450 and Yes	Q1ft	Strand (iii) ft correct decision for their 450 with M1 awarded

Q	Answer	Mark	Comments
3	top row: (0).5(0)	B3	B2 two correct B1 one correct
	middle row: 75(%)		
	bottom row: $\frac{1}{10}$ or $\frac{10}{100}$ oe		
4(a)	Six thousand two hundred (and) seventeen	B1	Condone spelling mistakes if intention clear
4(b)	6220	B1	
4(c)	1267	B1	
4(d)	2761	B1	
5(a)	4834	B1	
5(b)	91	B2	B1 98 or any odd multiple of 7 other than 7 and 91 or lists multiples of 7 with at most one error with an odd number answer in range
5(c)	$18 = 2 \times 9$ or 18 is in the 9 times table or 9 divides into 18 (exactly)	B1	oe
6	8×12	M1	
	96 and No	A1	
	Alternative method 1		
	$100 \div 8$	M1	
	12.5 and No	A1	oe
	Alternative method 2		
	$100 \div 12$	M1	
	8.3(…) and No	A1	oe

Q	Answer	Mark	Comments
7(a)	$4x$	B1	
7(b)	y^3	B1	
7(c)	$b + a$	B1	
8	30×80 or 30×0.8 or 2400 or 24	M1	Ignore units
	their $24 \div 10 \times 2$ or 4.8(0) or $\frac{\text{their } 2400}{10} \times 2$ or 480 or $80 \div 10 \times 2 \times 30$ or 480	M1	oe correct method to find 20% of their 2400 or 24 $80 \div 10 \times 2 \times 30$ implies M2
	their 2400 – their 480 or their 24 – their 4.8(0)	M1dep	dep on 2nd M1
	£19.20 or 1920p	Q1ft	Strand (i) correct money notation Do not accept 19.20 or £19.20p or £19.2 ft only with answer as a multiple of 10p ft is not allowed with M3 awarded
	Alternative Method		
	80×0.2 or $\frac{80}{10} \times 2$ or 16	M1	oe Correct method to find 20% of 80
	80 – their 16 or 64	M1	Ignore units
	their 64×30	M1dep	dep on 2nd M1
	£19.20 or 1920p	Q1ft	Strand (i) correct money notation Do not accept 19.20 or £19.20p or £19.2 ft only with answer as a multiple of 10p ft is not allowed with M3 awarded

Q	Answer	Mark	Comments
9(a)	5×3 or 15	M1	
	8	A1	
9(b)	$65 \div 10$	M1	oe
	6.5	A1	oe
9(c)	11	B1	
9(d)	$5(a - 2)$	B1	
10	–8	B3	B2 10 – 6 – 6 – 6 with one arithmetic error or 10, 4, –2, … B1 10, 4, …. , …. SC2 answer –14
11	23 and 29	B2	Either order B1 one correct answer only or one correct and one incorrect or two correct and one incorrect or any two prime numbers
12	(Bag B =) $3n$	B1	oe Accept other letter used
	(Bag C =) $n + 14$	B1	oe Accept other letter used
	their $3n$ = their $n + 14$	M1	Consistent use of letter on both sides
	7	A1	With B2 awarded SC1 correct answer without B2 awarded

Q	Answer	Mark	Comments
13(a)	(0).06 or $\frac{6}{100}$	B1	oe decimal or fraction
13(b)	(0).32	B2	B1 (0).02 or (0).12 or (0).22 or (0).42 or –(0).32
14	$\frac{5\times3}{6\times20}$	M1	
	$\frac{15}{120}$	A1	oe fraction
	$\frac{1}{8}$	B1ft	ft their fraction answer correctly cancelled down into its simplest form
15(a)	300 or 600 or 50 or 100 or 20	M1	
	300 or 600 and 50 or 100 and 20	M1	
	720	A1	SC2 480 SC2 860 SC2 719 SC1 any table value rounded to 1sf SC1 715 SC1 720 without M1 awarded
15(b)	(349 + 349 + 59 + 59 + 39 or 855) – (299 + 299 + 49 + 49 + 19 **or** 715 **or** their incorrect total of exact values for July in part(a))	M1	
	140	A1ft	ft 855 – their incorrect total of exact values in part(a)
	Alternative Method		
	$2\times50 + 2\times10 + 20$ or 350 + 350 + 60 + 60 + 40 – their 720	M1	
	140	A1ft	ft 860 – their 720 from rounding in part(a)

Q	Answer	Mark	Comments
16(a)	$5 \times 5 \times 5$ or $125 \div 5 \div 5 = 5$ or $5^2 = 25$ and 25×5 or $5^2 \times 5$ or 5^3	B1	oe Condone $\sqrt[3]{125} = 5$
16(b)	$a = 4$ and $b = 121$ and $a = 25$ and $b = 100$ (both in either order)	B2	B1 $a = 4$ and $b = 121$ or $a = 25$ and $b = 100$ (either order) B1 correct list of square numbers to 100 allow one error or omission
17	Correct method to change $\frac{5}{8}$ **and** $\frac{2}{3}$ into fractions with common denominator with at least one correct numerator	M1	eg $\frac{16}{24}$, $\frac{15}{24}$ (either way around)
	Correct fractions and No	A1	
	Alternative method 1		
	Correct method to calculate $\frac{5}{8}$ of a chosen value **and** $\frac{2}{3}$ of the same value	M1	eg $5 \times 40 \div 8$ and $2 \times 40 \div 3$ or $\frac{5}{8} \times 40$ and $\frac{2}{3} \times 40$
	Correct evaluations and No	A1	

Q	Answer	Mark	Comments
	Alternative method 2		
	Correct method to change $\frac{5}{8}$ **and** $\frac{2}{3}$ into decimals or percentages	M1	
	$\frac{5}{8}$ = 0.625 or 62.5(%) and $\frac{2}{3}$ = 0.66(6…) or 0.67 or 66(.6…)(%) or 67(%) and No	A1	Correct and consistent decimals or percentages
18(a)	18 (×) 2 or 12 (×) 3 or 9 (×) 2 (×) 2 or 3 (×) 3 (×) 4 or 2 (×) 3 (×) 6	M1	Allow on prime factor tree or repeated division Condone 18 (×) 2 (×) 1 etc. for this mark
	2 (×) 2 (×) 3 (×) 3	A1	Allow on prime factor tree or repeated division
	$2^2 \times 3^2$	A1ft	ft any product of prime numbers in index form if M1 awarded
18(b)	9	B2	B1 answer 3 or 3^2 or 3×3 or $81 = 3^4$ or 3 (×) 3 (×) 3 (×) 3
19	12×10 or 120(£ or %) or 24×6 or 144(£ or %) or 36×4 or 144(£ or %)	M1	oe Correct method to calculate comparable values
	120(£ or %) and 144(£ or %) and 144(£ or %)	A1	
	A	Q1ft	Any indication Strand (iii) Correct decision based upon their values after M1 awarded

SP/12/13