AQA Qualifications

GCSE

Mathematics

Unit 2: Foundation 43602F

Mark scheme

43602F

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Version: 1.0 Final

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.

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.
M dep	A method mark dependent on a previous method mark being awarded.
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.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
ft	Follow through marks. Marks awarded following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
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…	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416

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.

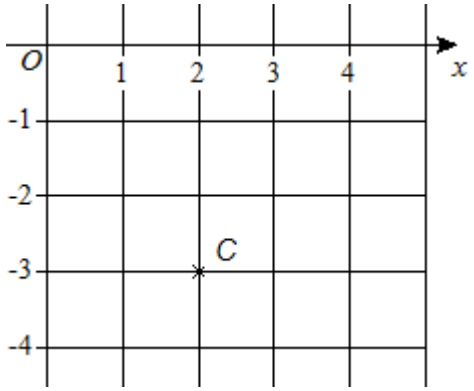
Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the candidate intended it to be a decimal point.

Q	Answer	Mark	Comments
1(a)	8 × 0.3(0) or 2.4(0) or 6 × 0.45 or 2.7(0)	M1	8 × 30 or 240 or 6 × 45 or 270
	8 × 0.3 + 6 × 0.45 or 2.4(0) + 2.7(0) or 5.1(0) or 4.9	M1	8 × 30 + 6 × 45 or 240 + 270 or 510 or 490
	4.90	A1	SC2 4.60
	Additional Guidance		
	£4.90p		M1M1A1
	£ 490p		M1M1A0
	8 × 30 = 210 6 × 45 = 180 210 + 180 = 380 6.20		M1M1A0
	10 – 2.4(0) – 2.7(0) is at least M1M1		

Q	Answer	Mark	Comments
1(b)	$30x + 45y$	B1	oe ignore attempts to factorise do not accept other further working
	Additional Guidance		
	Accept correct expression followed by = any numerical value eg $30x + 45y = 5.10$		B1
	$30 \times x + 45 \times y$ or $x \times 30 + y \times 45$		B1
	$x \times 30p + y \times 45p$		B0
	$x30 + y45$		B0
	$30x + 45y$ with answer $15(2x + 3y)$		B1
	$30x + 45y$ with answer $15(x + 3y)$		B1
	$30x + 45y$ with answer $5(6x + 7y)$		B1
	$30x + 45y$ with answer $2x + 3y$		B0
	$30x + 45y$ with answer $75xy$		B0

2(a)	(1, 2)	B1	
	Additional Guidance		
	Do not accept $(1x, 2y)$		
	If answer line blank, check grid		

Q	Answer	Mark	Comments
2(b)	*C* plotted at (2, –3)  	B1	Need not be labelled Mark intention

2(c)	(–2, –2)	B1	
	Additional Guidance		
	(–2 , –4)		B0
	If answer line blank, check grid		

Q	Answer	Mark	Comments
3	**Alternative method 1**		
	2300 – 1650	M1	
	650	A1	Allow 650 + 1650 = 2300
	650 and Yes	Q1ft	Strand (iii) ft M1 and correct decision for their 650
	Alternative method 2		
	2300 – 550	M1	
	1750	A1	Allow 550 + 1750 = 2300
	1750 and Yes	Q1ft	Strand (iii) ft M1 and correct decision for their 1750
	Alternative method 3		
	1650 + 550	M1	
	2200	A1	
	2200 and Yes	Q1ft	Strand (iii) ft M1 and correct decision for their 2200
	Alternative method 4		
	2300 – 1650 – 550	M1	
	100	A1	Allow 1650 + 550 + 100 = 2300
	100 and Yes	Q1ft	Strand (iii) ft M1 and correct decision for their 100
	Additional Guidance		
	Accept any indication of Yes		
	650 – 550 = 150, Yes		M1A1Q1
	650 – 550 = 100 so £100 left		M1A1Q1

Q	Answer	Mark	Comments
4(a)	1 and 7	B1	either order
	Additional Guidance		
	Accept one and seven		
4(b)	3	B1	
5	**Alternative method 1**		
	A correctly evaluated trial using white tiles and blue tiles eg 2 x 80 + 3 x 50 = 310	M1	
	A second correctly evaluated trial with more white tiles than blue tiles and at least 390 tiles in total eg 2 x 80 + 3 x 50 = 310 and 3 x 80 + 3 x 50 = 390	M1dep	
	3 (boxes of white tiles) and 4 (boxes of blue tiles)	A1	SC2 Answer of 5W + 1B or 4W + 3B
	Alternative method 2		
	(80), 160, 240 and (50), 100, 150, 200	M1	
	240 and 200 selected	M1	240 + 200 is M2
	3 (boxes of white tiles) and 4 (boxes of blue tiles)	A1	SC2 Answer of 5W + 1B or 4W + 3B
	Additional Guidance		
	130, 260, 390, (520)		M1M1A0
	130, 260		M1M0A0

Q	Answer	Mark	Comments
6(a)	11	B1	Accept ±11
	Additional Guidance		
	Do not accept –11 only		B0
	Do not accept 11 × 11 (= 121) or 11^2 (= 121)		B0
6(b)	9	B1	
6(c)	Tenths or $\frac{1}{10}$ or seven tenths or 7 tenths or $\frac{7}{10}$ or 0.7	B1	
	Additional Guidance		
	Do not accept tens, seven tens, 7 tens		B0
6(d)	3.55	B1	
7(a)	40 and 80	B1	either order

Q	Answer	Mark	Comments
7(b)	**Alternative method 1**		
	A correctly evaluated trial of two numbers, with one 50% bigger than the other	M1	eg 10 + 15 = 25
	12 and 18	A1	either order
	Alternative method 2		
	$x + 1.5x = 30$ or $2.5x = 30$ or $30 \div 2.5$	M1	
	12 and 18	A1	either order

8(a)	25	B1	
	Additional Guidance		
	25 – 11 = 14 with no or incorrect answer		B0

8(b)	19 + 5 or 24	M1	
	8	A1	SC1 $\frac{14}{3}$ or $4\frac{2}{3}$ or $4.\dot{6}$
	Additional Guidance		
	Embedded answer without ($y =$) 8		M1A0

Q	Answer	Mark	Comments
8(c)	7c + 2d or 2d + 7c	B1	Do not accept further working
	Additional Guidance		
	Accept 7C + 2D		B1
	7c + 2d = 9cd		B0
8(d)	7 × 3 or 21 or 2 × –4 or –8	M1	
	13	A1	

Q	Answer	Mark	Comments
9	**Alternative method 1**		
	1 ÷ 0.2 or 5 or 1 ÷ 0.25 or 4	M1	oe 5 × 0.2 = 1 or 4 × 0.25 = 1
	their 5 × 3 or 15 or their 4 × 3 or 12	M1	
	12	A1	with no incorrect working SC2 answer 12 with incorrect conversion of units
	Alternative method 2		
	Any correct scaling	M1	eg 0.4 kg = 6 (pancakes)
	1 kg = 5 × 3 (pancakes) or 1 kg = 15 (pancakes) or 1 litre = 4 × 3 (pancakes) or 1 litre = 12 (pancakes)	M1	
	12	A1	with no incorrect working SC2 answer 12 with incorrect conversion of units
	Additional Guidance		
	Correct scaling values 0.4 kg 0.5 litres 6 pancakes 0.6 kg 0.75 litres 9 pancakes 0.8 kg 1.0 litres 12 pancakes 1.0 kg 1.25 litres 15 pancakes		
	Incorrect conversions may cancel out for SC2 eg 20 g × 5 = 100 (1 kg) 25 ml × 4 = 100 (1 litre) 3 × 4 = 12		SC2

Q	Answer	Mark	Comments
10(a)	(0).08 or $\frac{8}{100}$	B1	oe decimal or fraction
	Additional Guidance		
	Condone use of comma eg 0,08		B1
	Accept $\frac{2}{25}$ or $\frac{4}{50}$ or 0.080 etc		B1
10(b)	0.4(0) or 40% or 0.35 or 30% or any two of $\frac{4}{10}$, $\frac{3.5}{10}$ $\frac{3}{10}$ or any two of $\frac{40}{100}$, $\frac{35}{100}$, $\frac{30}{100}$	M1	oe fractions with common denominators
	0.3 35% $\frac{2}{5}$	A1	oe values
	Additional Guidance		
	Beware of correct answer with an incorrect conversion $\frac{2}{5}$ = 60% and 0.3 = 30% followed by 0.3 35% $\frac{2}{5}$ on answer line		M1A0
11(a)	100	B1	
11(b)	72	B1	
11(c)	18	B1	

Q	Answer	Mark	Comments
12(a)	Straight line from (0900, 0) to (1100, 120)	B1	
12(b)	Straight line from (1030, 0) to (1200, 120)	B1ft	ft (1200, their 120) from their distance at 1100 in part (a)
12(c)	80	B1ft	ft speed from their distance-time graph for Train *B*
	Additional Guidance		
	If their distance-time graph for Train B goes from (1030, 0) to (1200, 120) the answer for (c) must be 80		
	For ft their distance-time graph for Train B must be a straight line for at least 90 minutes		
13(a)	Identifies or implies 12 or –12 as the difference or –9 as first value or their –9 – 12 correctly evaluated as second value	M1	
	–9 and –21	A1	

Q	Answer	Mark	Comments
13(b)	(third term =) $4a$ or (fourth term =) $8a$ or $7a$ (= 63) or $15a$	M1	
	$a = 63 \div 7$ or $a = 9$ or 8×9 or 15×9	M1	seen or implied
	135	A1	
	Additional Guidance		
	$a = 9$ is implied by second term 18 or third term 36 or fourth term 72, not from an incorrect sequence		

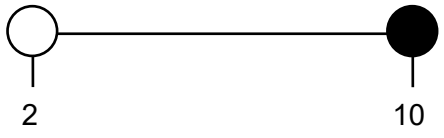
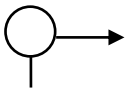
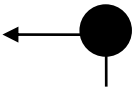
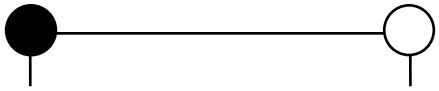
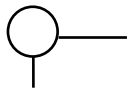
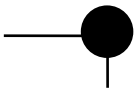
14	0.8×1550 or 1240	M1	oe
	$1950 \div 3 \times 2$ or 1300	M1	oe
	their 1300 – $0.05 \times$ their 1300 or $0.95 \times$ their 1300 or 1235	M1	their 1300 can be their 1240 if greater than 1250
	1240 and 1235	A1	as final values
	(Car) B	Q1ft	Strand (iii) ft for correct decision based on their values, with at least M2 scored and one correct final value SC2 1368 and 1200 or 1162.5(0) and 1202.5(0) SC1 1368 or 1162.5(0) or 1202.5(0)
	Additional Guidance		
	Car A = 1240 and Car B = 1300 with correct decision of Car A		M1M1M0A0Q1ft

Q	Answer	Mark	Comments
15	$\frac{6}{20}$ or 0.3(0) or 6 ÷ 20 (× 100) or 6 × 5	M1	oe fraction $\frac{3}{10}$ or $\frac{30}{100}$
	30	A1	SC1 70
	Additional Guidance		
	Percentage build up scores 0 or 2		
16	$12x + 28$ or $– 5x + 10$ or $5x – 10$	M1	
	$12x + 28 – 5x + 10$	A1	Fully correct
	$7x + 38$	A1ft	ft M1 scored and correct simplification of their four terms with two in x Do not ignore further work SC2 $7x + 18$
	Additional Guidance		
	Answer $7x + 38$		M1A1A1
	Do not allow further work eg $7x + 38 = 45x$		M1A1A0
	Allow further work in trying to solve equation after $7x + 38$ seen to score A1 for final accuracy mark		

Q	Answer	Mark	Comments
17(a)	15 : 65	B1	oe eg $\frac{15}{80}:\frac{65}{80}$
	3 : 13	B1ft	ft their 15 : 65 written in simplest form, with division to both sides of ratio
	Additional Guidance		
	13 : 3 implies 65 : 15		B0B1ft
	15 : 80 followed by 3 : 16		B0B1ft
17(b)	**Alternative method 1**		
	150 ÷ (5 – 2) or 150 ÷ 3 or 50	M1	
	their 50 × 7 or their 50 × 5 or 250 and their 50 × 2 or 100	M1 dep	
	350	A1	SC1 210
	Alternative method 2		
	$\frac{5}{2}=\frac{x+150}{x}$	M1	oe $5x = 2(x + 150)$
	$(x =)$ 100 and $(x + 150 =)$ 250	M1	
	350	A1	SC1 210
	Additional Guidance		
	250 and 100 is at least M1M1		

Q	Answer	Mark	Comments
18	**Alternative method 1**		
	$\frac{3}{12}$ (+) $\frac{2}{12}$ or $\frac{5}{12}$ or $\frac{6}{24}$ (+) $\frac{4}{24}$ or $\frac{10}{24}$	M1	oe common denominator
	1 – their $\frac{5}{12}$ or $\frac{7}{12}$ or 12 – their 5 or 1 – their $\frac{10}{24}$ or $\frac{14}{24}$ or 24 – their 10 or 14 (blue discs)	M1	oe their $\frac{5}{12}$ must be from $\frac{1}{4}+\frac{1}{6}$
	7	A1	
	Alternative method 2		
	Multiple of 12 for total number of discs or Number of red discs and white discs in ratio 3 : 2	M1	implied by LCM of 12 eg 6R, 4W
	Numbers of discs in ratio 3 : 2 : 7	M1	eg 6R, 4W, 14B
	7	A1	
	Additional Guidance		
	7 out of 12 on answer line		M1M1A1
	$\frac{7}{12}$ on answer line		M1M1A0
	3 (red) 2 (white) 7 (blue) without 7 on answer line		M1M1A0
	$\frac{1}{4}+\frac{1}{6}=\frac{2}{10}$ $1-\frac{2}{10}$		M0M1A0

Q	Answer	Mark	Comments
19(a)	–3, –2, –1, 0, 1	B1	Any order
	Additional Guidance		
	–3, –2, –1, 0, 1, 2		B0

19(b)		B2	B1  or  or  and  or 
	Additional Guidance		
	Intention must be clear to indicate $x > 2$ with minimum of a line drawn to the right of hollow circle positioned at 2 		B1
	Intention must be clear to indicate $x \leq 10$ with minimum of a line drawn to the left of filled circle positioned at 10 		B1