GCSE

Mathematics

Foundation Tier Unit 2 Number and Algebra
Mark scheme

43602F

November 2015

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.
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 …	Accept 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)	4531	B1	
	Additional guidance		
	Four thousand five hundred and thirty one		B1
1(b)	1, 3, 7 and 21	B2	B1 two correct with no incorrect or three correct with at most one incorrect or four correct with one or two incorrect
	Additional guidance		
	1 × 21 and 3 × 7		B2
	3 × 7		B1
	3, 7, 21		B1
	3, 7, 8, 21		B1
	1, 3, 4, 7, 8, 21		B1
	7		B0
	1, 2, 3, 4		B0
	1, 2, 3, 4, 7		B0

Q	Answer	Mark	Comments
1(c)	$5 \times 4 = 20$ or 5, 10, 15, 20 (…..)	B1	oe $20 \div 5 = 4$
	Additional guidance		
	Ignore incorrect statement alongside a correct calculation		
	20 is the 4^{th} multiple of 5		B1
	$20 \div 4 = 5$		B1
	it's quarter of 20		B1
	20 is a multiple of 5 (this is the question)		B0
	20 is in the 5 times table		B0
	5 divides into 20 (exactly)		B0
	5 is a factor of 20		B0
	5 fits into 20 (exactly)		B0
	5 goes into it (exactly)		B0
	20 goes into 5 (exactly)		B0
	20 is a factor of 5		B0
2(a)	Two point four six	B1	
	Additional Guidance		
	Two decimal point four six		B1
	Two decimal four six		B0
	Two point forty six		B0
	Two . four six		B0
2(b)	2050	B1	

Q	Answer	Mark	Comments
2(c)	Hundred(s) or four hundred(s) or 4 hundred(s) or 400 or 100(s)	B1	
	Additional Guidance		
	Four hundredths, 4 hundredths, 400ths or four 100ths		B0
2(d)	26	B1	
2(e)	$2 \times 6 \div 4$ or $6 \times 2 \div 4$ or $6 \div 4 \times 2$ or $6 \div (4 \div 2)$ or $6 \div (4 - 2)$ or $2 \div 4 \times 6$ or $2 \div (4 \div 6)$	B1	oe
	Additional Guidance		
	Accept intermediate evaluation in calculation eg $2 \times 6 = 12$, $(12) \div 4$ (= 3) $2 \div 4 = 0.5$, $(0.5) \times 6$ (= 3)		B1
	$2 \times \frac{6}{4}$ or $\frac{2 \times 6}{4}$		B1
	$6 \times \frac{2}{4}$ or $\frac{6 \times 2}{4}$		B1
	$6 \div \frac{4}{2}$ or $2 \div \frac{4}{6}$		B1
	$6 \div 4 \div 2$ or $2 \div 4 \div 6$		B0
	$2 + 4 = 6$, $6 \div 2$ (= 3)		B0

Q	Answer	Mark	Comments
3(a)	0.75	B1	
3(b)	30%	B1	
3(c)	$\frac{12}{15}$	B1	
4(a)	5	B1	Answer may be seen in the sequence
	Additional Guidance		
	Accept –3 on answer line with 5 also seen in working		B1
4(b)	35 and 41	B1	Either order Answers may be seen in the sequence Ignore further working
4(c)	$6n + 5$	B2	oe B1 $6n$ (+ k) with k any value
	Additional Guidance		
	Accept other letter used eg $6x + 5$		
	Ignore $n =$ before or $= n$ after their expression		
	$6 \times n + 5$		B2
	$n \times 6 + 5$		B2
	$6 \times n$ (+ k)		B1
	$n6 + 5$		B1
	$n \times 6$ (+ k)		B1
	$n6$ (+ k)		B0

Q	Answer	Mark	Comments
5	4 / 2 12 / 6 8 1 or 4 / 12 2 / 1 8 6 or 6 / 8 2 / 1 12 4 or 6 / 2 8 / 4 12 1 or 1 / 12 8 / 4 2 6 or 1 / 8 12 / 6 2 4	B3	B2 two correct lines eg 2 / 4 12 / 6 8 1 B1 one correct line eg 1 / 4 2 / 12 6 8

6(a)	45 ÷ 5 (× 3) or 9 (× 3) or 45 × 3 (÷ 5) or 135 (÷ 5)	M1	
	27	A1	
	Additional Guidance		
	A full method with equivalent fraction, decimal or percentage eg 45 ÷ 10 × 6 or 0.6 × 45 with working seen or 60% of 45 with working seen	M1	

6(b)	$\frac{1}{15}$	B1	oe
	Additional Guidance		
	$\left(\frac{5}{15}\times\frac{3}{15}=\right)\ \frac{15}{225}$	B1	

Q	Answer	Mark	Comments
7	**Alternative method 1**		
	14 × 8 or 112 or 14 × 7	M1	
	Yes and 14 × 8 = 112 or Yes and 14 × 7 = 98	Q1	Strand (ii) Correct decision with fully correct working
	Alternative method 2		
	98 ÷ 14 or 7 or 98 ÷ 8 or 12(…)	M1	
	Yes and 98 ÷ 14 = 7 or Yes and 98 ÷ 8 = 12(…)	Q1	Strand (ii) Correct decision with fully correct working
	Alternative method 3		
	14, 28, 42, 56, 70, 84, 98	M1	Allow one error or omission
	Yes and 14, 28, 42, 56, 70, 84, 98	Q1	Strand (ii) Correct decision with fully correct working
	Additional Guidance		
	Yes can be implied by a correct statement eg They have enough		
	One error can lead to further incorrect values eg 14, 26, 40, 54, 68, 82, 96		M1Q0

Q	Answer	Mark	Comments
8	**Alternative method 1**		
	28 × 7 or 196	M1	
	0.2 × 7 or 1.4(0) or 1.2 × 7 or 8.4(0)	M1	oe
	(7 + their 1.4) × 10 or their 8.4 × 10 or 84	M1	oe
	280	A1	
	Alternative method 2		
	28 × 7 or 196	M1	
	0.2 × 10 or 2 or 1.2 × 10 or 12	M1	oe
	(10 + their 2) × 7 or their 12 × 7 or 84	M1	oe
	280	A1	
	Alternative method 3		
	0.2 × 10 or 2 or 1.2 × 10 or 12	M1	
	28 + 10 + their 2 or 28 + their 12 or 40	M1	oe
	their 40 × 7	M1	oe
	280	A1	
	Alternative method 4		
	(28 + 10) × 7 or 266	M1	
	0.2 × 10 or 2	M1	oe
	their 2 × 7 or 14	M1	oe
	280	A1	

Q	Answer	Mark	Comments
8 (cont)	**Alternative method 5**		
	28 × 7 or 196	M1	
	7 × 10 × 0.2 70 × 0.2 or 14	M1	oe
	(7 × 10) + their 14 or (7 × 10) × 1.2 or 84	M1	oe
	280	A1	
9(a)	0.684, 0.7, 0.81	B1	oe decimal, fraction or percentage
9(b)	(0).06 or $\frac{6}{100}$	B1	oe decimal or fraction
	Additional Guidance		
	Condone use of comma eg. 0,06		B1
9(c)	(0).23	B1	oe decimal or fraction
10(a)	18 × 0.5 or 9	M1	13.5 implies M1
	13.50	Q1	Strand (i) Correct money notation
	Additional Guidance		
	13.50p		M1Q0
10(b)	17.5 – 4.5 or 13	M1	
	26	A1	

Q	Answer	Mark	Comments
11	65 (English)	B1	
	74 (Maths)	B1	
	62.5 (Science)	B1	
	Additional Guidance		
	62.5 seen in working with answer 62 or 63		B1
12(a)	100	B1	Accept 1 hour 40 (minutes)
	Additional Guidance		
	100 seen with answer 1:40 or 1.40		B1
	1:40 or 1.40 without 100 seen		B0
12(b)	85	B1	
12(c)	A	B1	

Q	Answer	Mark	Comments
13(a)	$m + 6$	M1	oe
	$2(m + 6)$ or $2m + 12$	A1	oe
	Additional Guidance		
	accept other letter used		
	$2 \times (m + 6)$ or $(m + 6) \times 2$		M1A1
	$2 \times m + 6$		M1A0
	$m + 6 \times 2$		M1A0
13(b)	**Alternative method 1**		
	m + their $(m + 6)$ + their $2(m + 6)$ = 66	M1	
	$4m + 18 = 66$ or $4m = 48$ or their $4m$ + their 18 = 66 or their $4m$ = 66 – their 18	M1dep	Correctly collecting their three terms
	12	A1	
	Alternative method 2		
	Correct evaluation of three correct values for A, B and C	M1	
	A further correct evaluation of three correct values for A, B and C with a total closer to 66	M1dep	
	12	A1	

Q	Answer	Mark	Comments
14	$x^2 + 4x$ and $2x - x^2$ or B and D	B1	Either order
15	16 seen or 32 seen or 27 seen	M1	
	(2×) 16 (+) 27 or 32 (+) 27	M1	
	59	A1	SC2 43

Q	Answer	Mark	Comments
16	**Alternative method 1** Price of 40 batteries using packs		
	40 ÷ 4 or 10 (packs used in offer A) **and** 40 ÷ 5 or 8 (packs used in offer B)	M1	oe 8 is implied by the use of 6 packs in offer B
	their 10 x 2.52 or 25.2(0) or their 2.52 ÷ 3 × 2 or 1.68 or their 8 × 2.75 or 22 or $\frac{3}{4}$ × 40 ÷ 5 or 30 ÷ 5 or 6	M1	oe
	their 25.2(0) ÷ 3 × 2 or 10 × their 1.68 or 16.8(0) or $\frac{3}{4}$ × their 22 or their 6 × 2.75 or 16.5(0)	M1	oe
	16.8(0) and 16.5(0)	A1	oe
	(Offer) B	Q1ft	Strand (iii) ft for correct decision based on their values, with one correct value and first two method marks
	Additional Guidance		
	Allow any correct working in pence up to M3		
	Allow consistent working in pence for M3 and A1Q1ft		
	16.8(0) or 16.5(0) or 6 × 2.75 is minimum M0M1M1		

Q	Answer	Mark	Comments
16 (cont)	**Alternative method 2** Price of 40 batteries using unit price		
	2.52 ÷ 4 or 0.63 **and** 2.75 ÷ 5 or 0.55	M1	oe
	40 × their 0.63 or 25.2(0) or 40 × their 0.55 or 22	M1	oe
	their 25.2 ÷ 3 × 2 or 16.8(0) or $\frac{3}{4}$ × 40 × their 0.55 or 30 × their 0.55 or $\frac{3}{4}$ × their 22 or 16.5(0)	M1	oe
	16.8(0) and 16.5(0)	A1	oe
	(Offer) B	Q1ft	Strand (iii) ft for correct decision based on their values, with one correct value and first two method marks
	Additional Guidance		
	Allow any correct working in pence up to M3		
	Allow consistent working in pence for M3 and A1Q1ft		
	16.8(0) or 16.5(0) is minimum M0M1M1		

Q	Answer	Mark	Comments
16 (cont)	**Alternative method 3** Price per battery		
	252 ÷ 4 or 63 **and** 275 ÷ 5 or 55	M1	oe
	their 63 ÷ 3 × 2 or 42	M1	oe
	$\frac{3}{4}$ × their 55 or 41(.25)	M1	oe
	42 and 41(.25)	A1	oe
	(Offer) B	Q1ft	Strand (iii) ft for correct decision based on their values, with one correct value and first two method marks
	Additional Guidance		
	Allow any correct working in pounds up to M3		
	Allow consistent working in pounds for M3 and A1Q1ft		
	42 or 41(.25) is minimum M0M1M1		

Q	Answer	Mark	Comments
17	$5x - 2$ or $5(x - 2)$ or $5x - 10$	B1	oe
	$5x - 2 - (5x - 10)$ or $5x - 2 - 5(x - 2)$ or $5x - 10 - (5x - 2)$ or $5(x - 2) - (5x - 2)$	M1	oe
	or $5x - 2 - 5x + 10 = 8$ or $5x - 10 - 5x + 2 = -8$	Q1	oe Strand (ii) complete and correct algebra SC2 At least two pairs of correctly evaluated trials for both number machines with same input and a difference of 8 SC1 One pair of correctly evaluated trials for both number machines with same input and a difference of 8
	Additional Guidance		
	Accept other letter used		
	$x \times 5 - 2$	B1	
	$x5 - 2$	B0	
	Do not accept $x - 2 \times 5$ for B1 unless recovered for B1M1 only		
	$3 \times 5 - 2 = 13$ and $(3 - 2) \times 5 = 5$	SC1	
	1 3 –5 2 8 0 3 13 5 4 18 10 5 23 15 6 28 20 7 33 25 8 38 30 9 43 35 10 48 40		

Q	Answer	Mark	Comments
18(a)	2 (×) 66 or 3 (×) 44 or 2 (×) 6 (×) 11 or 3 (×) 4 (×) 11 or 12 (×) 11 or 2 (×) 2 (×) 33 or 2 (×) 3 (×) 22	M1	Any order Allow on prime factor tree or repeated division. Condone 2 (×) 66 (×) 1 etc
	2 × 2 × 3 × 11 or 2^2 × 3 × 11	A1	Any order
	Additional Guidance		
	2, 2, 3, 11		M1A0
18(b)	**Alternative method 1**		
	2 (x) 5 (x) 11 = 110	M1	
	22	A1	SC1 11
	Alternative method 2		
	List of factors of 110 **and** 132 up to 22 with 2 errors or omissions (1), 2, 5, 10, 11, 22 (55, 110) **and** (1), 2, 3, 4, 6, 11, 12, 22 (33, 44, 66, 132)	M1	
	22	A1	SC1 11
	Additional Guidance		
	(1, 55, 110) and (1, 33, 44, 66, 132) are not omissions		
19	32	B2	B1 4 or 16 or 0.5

Q	Answer	Mark	Comments
20	5600 ÷ (5 + 3) or 5600 ÷ 8 or 700	M1	
	3500 : 2100	A1	SC1 2100 : 3500