Version 1.0

General Certificate of Secondary Education
June 2013

Mathematics 43602F

Unit 2 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 students' 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 students' 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 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.

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Set and published by the Assessment and Qualifications Alliance.

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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.

Q	Answer	Mark	Comments
1a	37 and 65	B1	Any indication
1b	58	B1	
2	30	B1	
	37	B1 ft	ft their 30 + 7
3a	(2, 4)	B1	
3b	Point B plotted at (-3, -1)	B1	
3c	(2, −1)	B1 ft	ft from their (a)
4a	20 (p)	B1	Accept £0.20(p)
4b	10 × (25 − their 20) or 10 × 25 − 10 × their 20	M1	oe ft their 20 from (a) if < 25
	50 (p)	A1 ft	Accept £0.50(p)
5	10 or 40 used as an approximation	M1	
	400 or 410	A1	
6a	2 × 2(.00) + 1.25	M1	oe
	5.25	A1	
6b	10 − their 5.25	M1	
	4.75	A1 ft	ft their 5.25
7	Valid reason	B1	eg (23) is odd or prime or not an even number or not a multiple of 4
	Valid reason	B1	eg (36) is the only multiple of 6 or only square number
	Valid reason	B1	eg (40) is the only multiple of 10 or only one in 5 times table

Q	Answer	Mark	Comments
8a	5×8	M1	oe
	40.(00)	A1	
8b	$96 \div 8$	M1	oe
	12	A1	
9	$100 - (27 + 41)$	M1	oe
	32	A1	
	Correct minimum numbers for their 32 $R = 14$, $B = 0$, $G = 9$ scores 4 marks	B2ft	ft from their 32 B1 buys beads to make each number of each colour equal or two correct minimum numbers for their 32 SC2 $R = 14$ and $B = 0$ SC1 $R = 14$
10a	3.6	B1	
10b	0.325 0.5 0.62	B1	
10c	$\frac{4}{5}$ and 80%	B2	B1 for one correct (and one incorrect) or for two correct and one incorrect Any indication
11	Correct set of 3 numbers eg -2, 2 and 3 or -1, 1 and 12 or $-\frac{1}{2}$, $\frac{1}{2}$ and 48	B2	B1 for 3 numbers with a product of -12, or 3 numbers, two of which have a sum of 0, including at most 1 zero

Q	Answer	Mark	Comments
12	600 ÷ 4 (= 150)	M1	oe
	$\frac{40}{100} \times 600$ (= 240)	M1	oe
	their 150 + their 240 (= 390)	M1	600 – their 150 (= 450) or 600 – their 240 (= 360)
	600 – their 390	M1	their 450 – their 240 or their 360 – their 150
	210	A1	
	Alternative method 1		
	25(%)	M1	0.25
	their 25(%) + 40(%) (= 65(%))	M1	their 0.25 + 0.4(0) (= 0.65)
	100(%) – their 65(%) (= 35(%))	M1	1 – their 0.65 (= 0.35)
	$\frac{\text{their } 35(\%)}{100} \times 600$	M1	oe 0.35×600
	210	A1	
	Alternative method 2		
	$\frac{2}{5}$ or $\frac{40}{100}$	M1	oe
	their $\frac{5}{20}$ + their $\frac{8}{20}$	M1	oe makes common denominators with at least 1 correct numerator
	1 – (their $\frac{5}{20}$ + their $\frac{8}{20}$) (= $\frac{7}{20}$)	M1dep	
	their $\frac{7}{20} \times 600$	M1	oe
	210	A1	

Q	Answer	Mark	Comments
13a	$\frac{1}{12}$	B1	oe eg $\frac{12}{144}$
13b	($\frac{1}{4}$ **and)** $\frac{2}{4}$ or $\frac{2}{8}$ **and** $\frac{4}{8}$ or 25(%) **and** 50(%) or 0.25 **and** 0.5	M1	oe into equivalent form fractions with common denominator or percentages or decimals
	$\frac{1.5}{4}$	A1	oe eg $\frac{37.5}{100}$ or 37.5% or 0.375
	$\frac{3}{8}$	Q1	oe fraction Strand (ii)
	Alternative method		
	$\frac{1}{4} + \frac{1}{2}$ (= $\frac{3}{4}$)	M1	
	$\frac{3}{4} \times \frac{1}{2}$	A1	oe
	$\frac{3}{8}$	Q1	oe fraction Strand (ii)
14a	3×5 (-) $4 \times \frac{1}{2}$ or 15 (-) 2	M1	oe
	13	A1	
14b	$6x + 12$ or $2x + 2$	M1	
	$6x + 12 + 2x + 2$	A1	
	$8x + 14$	A1ft	oe ft from their 4 terms

Q	Answer	Mark	Comments
15a	$x + 5$ or $5 + x$	B1	
15b	x (+) $x + 5$ (+) $x + 10$ (+) $x + 15$ (=54)	B1	oe eg $4x + 30$
	their $4x$ + their 30 = 54	M1	collecting their four or more different algebraic expressions and equating
	their $4x$ = their 24	M1	54 – their 30 correctly evaluated from $ax + b = 54$ with $a > 1$
	6	A1	SC2 6 on answer line with no correct algebraic working
16a	27 or 16	M1	
	43	A1	
16b	(5^3 =) 125 or (10^2 =) 100	M1	
	125 and 100	A1	
	5^2	A1	25 without working implies M1A1

Q	Answer	Mark	Comments
17	1 (+) 2 (+) 6 (= 9)	M1	oe eg a (+) 2a (+) 6a (= 9a)
	180 ÷ their 9 (= 20)	M1	oe a = 180 ÷ 9 (= 20)
	6 × their 20	M1	
	120	A1	
	120 and Yes	Q1	Strand (iii) M3 awarded and a correct decision based on their 120 SC3 30, 60 and 90 with 90 and No SC2 30, 60 and 90
	Alternative method using T & I		
	ratio 1:2:6 seen or implied in any order	M1	
	Correctly evaluated trial	M1	eg 10 + 20 + 60 = 90
	2nd trial in ratio 1:2:6 correctly evaluated	M1	eg 15 + 30 + 90 = 135
	120	A1	
	120 and Yes	Q1	Strand (iii) M3 awarded and a correct decision based on their 120 SC3 30, 60 and 90 with 90 and No SC2 30, 60 and 90
18a	$4x \leq 13 + 7$ or $x - \frac{7}{4} \leq \frac{13}{4}$	M1	oe
	$x \leq 5$	A1	SC1 $x < 5$ or $x = 5$ or $x \geq 5$
18b		B2	B1 for  or  or