AQA Qualifications

GCSE
MATHEMATICS

Unit 1 43601H
Mark Scheme

43601H

November 2013

Final version 1.0

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 points plotted correctly	B2	Allow $\pm\frac{1}{2}$ square B1 for 3 or 4 correct plots
1(b)	One straight line through both gates (90, 8.5 - 9.5) and (130, 13 - 14)	B1	
1(c)	11.3	B1ft	ft their straight line of best fit Allow [11.0, 11.6] if B0 awarded in (b)
2	**Alternative Method 1**		
	At least one product attempted or one correct value (not 6) or 143	M1	1×6 2×10 or 20 3×22 or 66 4×9 or 36 5×3 or 15
	(their 6 + their 20 + their 66 + their 36 + their 15) ÷ 50 **or** 143 ÷ 50	M1dep	Must be adding products and dividing by 50 Condone missing brackets
	2.86	A1	
	Alternative Method 2		
	At least one product attempted or one correct value (not 6) or 143	M1	1×6 2×10 or 20 3×22 or 66 4×9 or 36 5×3 or 15
	their 6 + their 20 + their 66 + their 36 + their 15 or 143 **and** 3×50 or 150	M1dep	Must be adding products and multiplying 3 by 50
	143 **and** 150	A1	

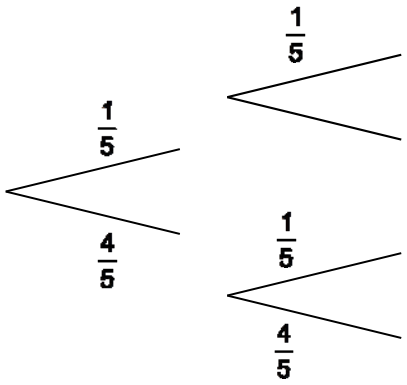
Q	Answer	Mark	Comments
3	Two-way table with three payment methods as row/column **and** men/women as column/row	B2	B1 for table with cash/card/token **or** men/women B0 for questionnaires intended for individuals to complete
4(a)	$\frac{152}{200} \times 100$ or $\frac{48}{200} \times 100$ or $\frac{76}{100}$ or $\frac{24}{100}$	M1	76 or 24 seen or implied
	76 and 24 seen or implied	A1	
	Bar drawn in correct position and shaded (Shop at the bottom) with correct height, division and width	B1ft	$\pm\frac{1}{2}$ small square ft their 76 or 24 but bar must total 100% SC2 bar wrong way round
4(b)	1 : 4	B2	B1 20 : 80 oe B1 a : b with its correct simplest form SC1 4 : 1
4(c)	$\frac{3}{4}$	B1	oe fraction eg $\frac{75}{100}$

Q	Answer	Mark	Comments
5	(Wales =) 60(°) or $\frac{1}{6}$ or 1(°) = 500 or 10(°) = 5000 or (NI =) 15 000 or (Scot =) 45 000 or (Eng =) 90 000	B1	Allow ± 2° May be implied Values may be on pie chart
	360 ÷ their 60 × 30 000 or 6 × 30 000 or 45 000 × 4 or their 15 000 + their 45 000 + their 90 000 (+ 30 000) or (15 000 + 30 000 + 45 000) (× 2)	M1	oe NI + Scot + Eng with **two** of NI, Scot or Eng correct (condone Wales missing) (Doubles) (NI + Wales + Scot) with NI **and** Scot correct
	180 000	A1	Accept integer in range [174 194, 186 206] from angle [58, 62] If 60° used must have 180 000
6(a)	qualitative and primary	B1	
6(b)	pie chart and bar chart	B1	

Q	Answer	Mark	Comments
7	**Alternative method 1**		
	100 – (25 + 35 + 30) or 10	M1	oe May be seen in table
	Valid attempt to find 1%, 100% or 5% or 50% 150 ÷ 25 or 6 (1%) or 150 ÷ 0.25 or 150 × 4 or 600 (100%) or 150 ÷ 5 or 30 (5%) or 150 × 2 or 300 (50%)	M1	oe
	their 10 × their 6 or their 10 ÷ 100 × their 600 or (their 10 ÷ 5) × their 30 or (their 10 ÷ 50) × their 300	M1dep	dep on previous M oe 150 ÷ 2.5 or 150 × 0.4 scores M2
	60	A1	
	Alternative method 2		
	150 ÷ 0.25 or 150 × 4 or 600 (100%)	M1	oe
	0.35 × their 600 or 210 **and** 0.3 × their 600 or 180	M1dep	oe
	their 600 – (150 + their 210 + their 180)	M1dep	oe
	60	A1	

Q	Answer	Mark	Comments
	Alternative method 3		
	150 ÷ 25 or 6 (1%)	M1	oe
	35 × their 6 or 210 **and** 3 × their 6 or 180	M1dep	oe
	their 6 × 100 – (150 + their 210 + their 180)	M1dep	oe
	60	A1	
8	**Alternative Method 1**		
	1.032 seen	M1	
	5000×1.032^3	M1	oe
	5495.523...	A1	May be implied
	5495.52	B1ft	ft their answer rounded to 2 dp SC1 5480
	Alternative method 2		
	5000 + 5000 × 0.032 or 5160	M1	oe
	their 5160 + their 5160 × 0.032 or 5325.12 **and** their 5325.12 + their 5325.12 × 0.032	M1	
	5495.523...	A1	May be implied
	5495.52	B1ft	ft their answer rounded to 2 dp SC1 5480

Q	Answer	Mark	Comments
9(a)	300, 425, 500	B1	
9(b)	Plotted at UCBs ($\pm\frac{1}{2}$ sq)	Q1	Strand (ii) Plotted at 40, 60, 80, 100 ($\pm\frac{1}{2}$ sq) Allow one error or omission
	Heights correct ($\pm\frac{1}{2}$ sq)	B1ft	80, 300, 425, 500 if correct Allow one error or omission Increasing function not straight line ft values from table
	Smooth curve or polygon through **all** their points	B1ft	ft their 4 plots Increasing function not straight line B3 only for fully ft correct
9(c)	**Alternative Method 1**		
	0.9×500 or 450 seen	M1	oe Mark/ line on graph at 450
	[86, 87]	A1ft	ft their increasing curve or line
	Alternative method 2: Using table		
	$\frac{50}{75} \times 20$ or 13.3... or $\frac{25}{75} \times 20$ or 6.6... or 6.7	M1	oe
	[86, 87]	A1	

Q	Answer	Mark	Comments
10(a)		B2	oe B1 at least one correct pair of probabilities or all top probabilities = $\frac{1}{5}$ or all bottom probabilities = $-\frac{4}{5}$
10(b)	$\frac{1}{5} \times \frac{4}{5}$ or $\frac{4}{25}$	M1	oe May be at end of tree diagram
	$\frac{8}{25}$ or 0.32	A1ft	oe ft their tree diagram
11	Selects 1 000 000 or 1×10^6 or 5×10^3 or 5000	B1	
	Subtracts two values from list $1\,000\,000 - 5 \times 10^3$	M1	oe Condone incorrect conversion to or from standard form for this mark
	995 000	A1	May be implied
	9.95×10^5	Q1ft	Strand (i) ft any answer correctly converted to standard form
12(a)	175 – 65 (= 110)	B1	
12(b)	$110 \times 30 \div 240$ or $240 \div 30 = 8$ or $30 \div 240 = 0.125$	M1	oe $110 \div 8$ 110×0.125 Condone $30 \times$ [0.45, 0.46]
	13.75	A1	May be implied
	14	A1ft	ft any correctly truncated or rounded decimal SC2 13 SC2 5 (from total 695) SC1 4 or 4.7(...) (from total 695)

Q	Answer	Mark	Comments

13(a)	15 or 5 in correct position in table	B1	
	Either bar correct area in histogram (40 – 60 bar 3 large squares high or 75 – 95 bar 5 large squares high)	M1	
	Table correct, histogram correct **and** vertical scale or key shown	A1	1 large square = 2.5 people oe or 10 small squares = 1 person oe or scale of 0.5 per cm or scale of 1 per 2 cm
13(b)	$\frac{3}{4} \times 120$ or 90 seen	M1	$\frac{1}{4} \times 120$ or 30
	85	A1	

14	1 B 2 D 3 A 4 C	B3	B2 for 2 correct B1 for 1 correct but not all the same

SP/12/13