AQA Qualifications

GCSE

Mathematics

Unit 1 43601F

Mark scheme

43601F
November 2014

Version 1.1

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.
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.
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.
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

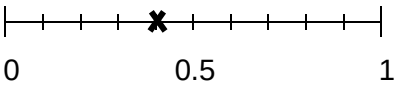
Erased or crossed out work that is still legible should be marked.

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)	unlikely	B1	
1(b)	impossible	B1	
1(c)	Draws a cross at 0.4  	B1	Accept any unambiguous indication of the correct position
1(d)	0.6	B1ft	oe fraction or percentage Correct or ft 1 – their 0.4 from (**c**)
1(d)	**Additional Guidance**		
	Accept 0.6 oe as correct even if (c) is incorrect		
	ft their (c) eg cross marked half way between 0.4 and 0.5, accept answer to (d) of 0.55, 55%, 55/100 oe		
	Ignore change of form or incorrect cancelling once correct probability seen		
	Ignore probability words		
2(a)	Subtracting two amounts with one correct 124 – 79.5 or 124 and 79.5 chosen	M1	79.5 + 44.5 = 124
	44.50	A1	Condone 44.5

2(b)	**Alternative method 1**		
	124 + 79.5(0) + 122.5(0) + 96 + 85 or 507	M1	Allow one error or omission
	their total ÷ 2	M1	Condone bracket error ie 124 + 79.5(0) + 122.5(0) + 96 + 85 ÷ 2 or 464.5(0) for M2
	253.50	Q1	Strand (i) Correct notation 253.5 is M2Q0 SC2 760.50 SC1 760.5
	Alternative method 2		
	At least **two** of these divisions 124 ÷ 2 or 62 79.5(0) ÷ 2 or 39.75 122.5(0) ÷ 2 or 61.25 96 ÷ 2 or 48 85 ÷ 2 or 42.5(0)	M1	
	their 62 + their 39.75 + their 61.25 + their 48 + their 42.50	M1	Allow one omission
	253.50	Q1	Strand (i) Correct notation 253.5 is M2Q0 SC2 760.50 SC1 760.5

2(b)	**Additional Guidance**
	If they do further division, mark the **whole** method eg 507 ÷ 2 ÷ 2 M1M0

3(a)	At least four correct frequencies	M1	May be seen in frequency table or implied by bars
	Five bars drawn to 1, 1, 10, 3, 5 in any order, but matching the continent labels if given	A1	
	Frequency axis correctly scaled, starting at 0, with at least two numbers given	B1	Ignore scaling beyond their tallest bar Must be using a scale of at least 0.5 cm per unit
	Correct structure – equal width bars, gaps **and** labels	Q1	Strand (ii) Logical organised working Must have gaps of equal width between bars Labels may be eg frequency or (number of) concerts and continent names (may be on bars)

3(a)	**Additional Guidance**
	Evidence for the M mark could be found in or around the table, or from the bar heights
	Condone bars of different widths for all but the Q mark
	If no vertical scale is shown, assume 1 square = 1 concert or ½ square = 1 concert
	Vertical line graph can score all but the Q mark
	Horizontal or vertical bar chart can score full marks
	Allow vertical label to be ‘Concerts’ or ‘Numbers’ but not ‘Tally’

3(b)	$\frac{5}{20}$	M1	oe Accept ‘5 out of 20’ or ‘1 in 4’ for this mark
	$\frac{1}{4}$	A1	SC1 for fully simplifying any fraction

4(a)	33	B1	

4(b)	<table><tr><td></td><td>Y</td><td>N</td><td></td></tr><tr><td>W</td><td></td><td>17</td><td></td></tr><tr><td>M</td><td></td><td></td><td>45</td></tr><tr><td></td><td>51</td><td>29</td><td></td></tr></table>	B3	B2 Three correct entries B1 One or two correct entries

5(a)	Pink	B1	

5(b)	Yellow	B1	

6(a)	(+) 30 – 6 (= 24) or 24 + 6 = 30 or 30 – 24 = 6	B1	Condone written explanation eg 30 entered and 6 left

6(b)	**Alternative method 1**		
	21 – 25 or -4 or 20 or 75 – 70 or 5 or 25 or 40 – 38 or 2	M1	
	27	A1	
	Alternative method 2		
	30 + 21 + 75 + 40 or 166 or 6 + 25 + 70 + 38 or 139	M1	
	27	A1	

7	4 × 15 or 60 seen	M1	oe 15 + 15 + 15 + 15
	110	A1	SC1 117 or 3215

7	**Additional Guidance**
	There is SC1 for students who think 7 × 0 = 7
	There is SC1 for students who work out (26 + 27 + 29 + 29) × 15 + 31 × 50
	If they work out 15 + 15 + 15 + 15 (+ 50) but then add on the number of sales allow the M mark

8	360 ÷ 5 × 2	M1	or 360 ÷ 15 × 4
	144° sector **drawn**	A1	Tolerance 2°
	Major sector divided into two sectors with the larger sector labelled 'No' and the smaller sector labelled 'Don't know'	Q1	Strand (ii) Logical organised working Accept any unambiguous representation of No and Don't know, eg N and D

9(a)	All four points plotted correctly (275, 125), (150, 190), (125, 225), (180, 175)	B2	B1 for two or three correct plots

9(b)	Appropriate line of best fit	B1	A straight line at least 4 squares wide which goes through, or would go through, the two gates (125, 175 - 225) and (275, 75 - 125)

9(c)	Correct reading from their graph	B1ft	ft their negative, straight line of best fit If B0 awarded in (b), accept answer in range [145, 150]

9(c)	**Additional Guidance**
	Allow ± ½ square tolerance but condone rounding up to the next 5 or down to the previous 5

10(a)	Subtracting two amounts with one correct 83 – 57.7 or 83 and 57.7 chosen	M1	57.7 + 25.3 = 83
	25.3	A1	Condone 25 300 000

10(b)	0.21 × their 126 200	M1	oe Condone any attempt to incorporate the million Digits 26 502 imply M1
	26 502	A1	Condone 26 502 000 000 SC1 99 698

10(b)	**Additional Guidance**
	Allow the method for 21% of any value from table (or misread) Possible answers are 17.43, 14.07, 12.117, 11 256, 11 739
	Must be using correct value for full marks
	Mark the **whole** method so further working will not score (except for those who misread and work out 21% off – see SC1)

10(c)	36 600 000 000 ÷ 29 300 000 or 36 600 (million) ÷ 29.3 (million)	M1	Digits 1249... or 125... imply M1
	1249. ...	A1	May be implied by 1250
	1250	B1ft	ft any answer correctly rounded to the nearest 10

11(a)	**Alternative method 1**		
	3 × 5 or 15 (children) or 20 (children)	M1	eg 3 : 15
	15 and 20 and No	A1	oe No, they had 5 extra children
	Alternative method 2		
	20 ÷ 5 or 20 (children) or 4 (adults)	M1	eg 4 : 20
	4 and No	A1	oe No, they needed 1 more adult

11(a)	**Additional Guidance**
	Allow misreads for the other sports on Saturday or walking on Sunday or walking on Saturday and Sunday: 27 ÷ 5 or 5.4 (adults) M1A0 18 ÷ 5 or 3.6 (adults) M1A0 30 ÷ 5 or 6 (adults) M1A0 50 ÷ 5 or 10 (adults) M1A0

11(b)	$\frac{1}{3}$ or $\frac{9}{27}$ or $\frac{8}{24}$	B1	oe **fraction**

11(c)	12 ÷ 3 or 30 ÷ 5 or 16 ÷ 2	M1	4 adults (archery) or 6 adults (walking) or 8 adults (sailing) NB 4, 6, 3 implies M0
	12 ÷ 3 and 30 ÷ 5 and 16 ÷ 2	M1	4 adults (archery) and 6 adults (walking) and 8 adults (sailing) Condone misread of **one** bar height if number of adults rounded up
	18	A1	Must be from 12, 30 and 16

11(c)	**Additional Guidance**
	Condone all M marks for misread of Saturday for any bar: Archery : 27 ÷ 3 = 9 Walking : 20 ÷ 5 = 4 Sailing : 18 ÷ 2 = 9 (Total = 22)
	Condone all M marks for misread of both days for any bar: Archery : 39 ÷ 3 = 13 Walking : 50 ÷ 5 = 10 Sailing : 34 ÷ 2 = 17 (Total = 40)
	NB 1 + 3 = 4 M0
	NB 1 + 5 = 6 M0
	12 ÷ 3 + 30 ÷ 5 + **15** ÷ 2 = 4 + 6 + 8 = 18 (the 8 is from wrong working but one misread of a bar height is allowed) M1M1A0

<table>
<tr>
<td>12</td>
<td>All four correct combinations and scores (in any order)
<table>
<tr><th>W</th><th>D</th><th>L</th><th>Score</th></tr>
<tr><td>4</td><td>0</td><td>0</td><td>8</td></tr>
<tr><td>3</td><td>1</td><td>0</td><td>7</td></tr>
<tr><td>3</td><td>0</td><td>1</td><td>6</td></tr>
<tr><td>2</td><td>2</td><td>0</td><td>6</td></tr>
<tr><td>2</td><td>1</td><td>1</td><td>5</td></tr>
<tr><td>1</td><td>3</td><td>0</td><td>5</td></tr>
</table>
</td>
<td>B3</td>
<td>B2 for any 2 or 3 correct combinations (condone missing or incorrect scores)
B1 for any 1 correct combination (condone missing or incorrect score)
Rows may be in any order</td>
</tr>
</table>

12	**Additional Guidance**
	Accept blank as zero
	Must have correct scores for B3
	Beware 2, 1, 0 = 5 (doesn't add up to 4 games)

13	11 chosen with no other number less than 11 chosen	B1	
	4×10 or 40	M1	
	23	A1	SC1 for 2 numbers with a total of 34

14	Primary selected **and** Secondary **not** selected	B1	
	Discrete selected **and** Continuous **not** selected	B1	

14	**Additional Guidance**	
	1, 3	B2
	1, 4	B1
	1, 3, 4	B1
	1, 2, 3	B1
	2, 3	B1