GCSE

Mathematics

Foundation Tier Unit 1 Statistics and Number
Mark scheme

43601F

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.

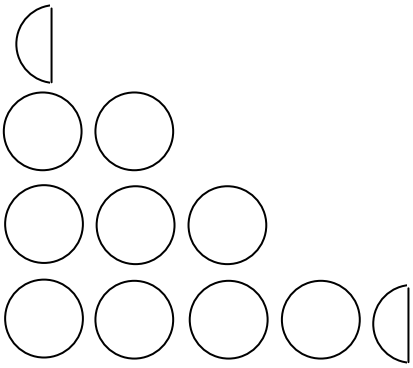
Choice
When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

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)	24	B1	Accept [23.5, 24.5] Ignore any words eg May
1(b)	Bar of height 25	B1	$\pm\frac{1}{2}$ small square
	Additional guidance		
	Mark the intention		
	Condone freehand		
	Ignore shading or lack of shading		
1(c)	June and September	B2	B1 one correct month and no more than one incorrect month
	Additional guidance		
	Accept any unambiguous representation of June and/or September eg Jun or S		
1(d)	[24, 31.5] – 19 or (July =) 31	M1	
	12	A1	
2(a)	25 × 14	M1	
	350 or 3.5(0)	A1	650 or 6.5 or 6.50p implies M1A1
	6.50	Q1ft	Strand (i) Correct money notation ft 10 – their 3.5(0) if M1 scored
2(b)	$\frac{14}{50}$ or $\frac{7}{25}$ or 0.28 or 28%	B1	oe Ignore words eg unlikely
2(c)	$\frac{36}{50}$ or $\frac{18}{25}$ or 0.72 or 72%	B1ft	oe ft their part (b) Ignore words eg likely

Q	Answer	Mark	Comments
3	Correct numbers of circles in each row 	B2	B1 for two or more rows correct Accept any orientation for the half-circles
	Appropriate alignment of symbols	Q1ft	Strand(ii) Organise their work clearly ft their symbols All four rows must be attempted with at least one half-circle used
	Additional guidance		
	Ignore any variation of symbol size		
	For Q1 the lengths of each row must be, in descending order; 1^{st}, 5^{th}, 4^{th}, 3^{rd}, 2^{nd}		

Q	Answer	Mark	Comments
4	17.31 or Medium chosen	B1	May be implied
	their 17.31 + 7.5 or 24. 81 or their 17.31 × 7 or 121.17 or their 7.5 × 7 or 52.5	M1	
	their 24.81 × 7 (+ 39.6) or their 17.31 × 7 + 7.5 × 7 (+ 39.6) or 173.67	M1dep	
	213.27	A1	SC3 209.07 or 290.55 Condone £213.27p
	Additional guidance		
	Adding 39.6 × 7 scores a maximum of B1 M1 M0 A0		
5(a)	25%	B1	
5(b)	(360 –) 90 + 81 + 42 + 33 + 87 or 333	M1	Allow one error or omission or extra
	27	A1	
5(c)	81 : 42	M1	oe eg $\frac{81}{360} : \frac{42}{360}$
	27 : 14	A1	SC1 correct simplification of their ratio SC1 14 : 27

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td>6(a)</td><td>mode</td><td>B1</td><td></td></tr>
<tr><td>6(b)</td><td>163</td><td>B1</td><td></td></tr>
<tr><td rowspan="2">6(c)</td><td>Selects 205 or 153</td><td>M1</td><td></td></tr>
<tr><td>52</td><td>A1</td><td>SC1 answer of 48 or 31</td></tr>
<tr><td rowspan="5">7(a)</td><td>9 brown-eyed boys and
9 brown-eyed girls</td><td>B1</td><td></td></tr>
<tr><td>17 boys and 23 girls</td><td>B1</td><td></td></tr>
<tr><td>12 blue-eyed girls and
5 green-eyed boys</td><td>B1ft</td><td>ft their 17 – their 9 – 3
and their 23 – their 9 – 2</td></tr>
<tr><td>15 blue eyes and 7 green eyes</td><td>B1ft</td><td>ft 3 + their 12 and their 5 + 2 if their third column totals 40</td></tr>
<tr><td colspan="3">The correct table is
<table>
<tr><th></th><th>Boys</th><th>Girls</th><th>Total</th></tr>
<tr><td>Brown</td><td>9</td><td>9</td><td>18</td></tr>
<tr><td>Blue</td><td>3</td><td>12</td><td>15</td></tr>
<tr><td>Green</td><td>5</td><td>2</td><td>7</td></tr>
<tr><td>Total</td><td>17</td><td>23</td><td>40</td></tr>
</table></td></tr>
<tr><td rowspan="2">7(b)</td><td>18 ÷ 40 (× 100)</td><td>M1</td><td></td></tr>
<tr><td>45</td><td>A1</td><td></td></tr>
</table>

Q	Answer	Mark	Comments
8(a)	$\frac{1}{6}$ (× 420) or $\frac{70}{420}$ seen	M1	oe
	70	A1	Accept 70 out of 420
8(b)	$\frac{23}{50}$ and 0.46 and 46%	B2	B1 circles one or two correct values **and** no more than one incorrect value
9(a)	7 + 10 + 4 + 3 (= 24)	B1	If the only working is in the table the addition and 24 must be shown
9(b)	7 × 1 or 10 × 2 or 20 or 4 × 3 or 3 × 4 or 12 or 51	M1	Attempt at *fx*
	(7 × 1 + 10 × 2 + 4 × 3 + 3 × 4) ÷ 24 or their 51 ÷ 24	M1dep	Accept one error or missing product Condone missing brackets eg 39.5
	2.125	A1	Accept 2 or 2.1 or 2.12 or 2.13 with fully correct working
	Additional guidance		
	One error could be an incorrect product		
	Evidence of a correct method may be seen in or around the table		
	Accept an incorrectly rounded answer if 2.125 shown		M1 M1 A1
9(c)	2.2 × (24 + 1) or 55	M1	
	4	A1ft	ft 55 – their 51 Condone an answer of 5 from a mean of 2.24 or an answer of 3 from a mean of 2.16
	Additional guidance		
	If using trial and improvement, must reach 55 as their final trial or clearly show it selected		M1

Q	Answer	Mark	Comments
10	States a valid reason about increasing sample size or interviewing a variety of people	B1	eg ask more people ask boys and girls ask adults too
11(a)	Negative	B1	Accept eg strong negative, weak negative
11(b)	One straight line through both gates (20, 75 – 90) and (80, 30 – 40)	B1	
	Additional guidance		
	Ignore outside gates		
	Line must cross at least 5 large squares		
	Joining points only		B0
	If the points are joined and a line of best fit is also drawn then mark the line of best fit		
11(c)	66	B1ft	ft their line of best fit $\pm\frac{1}{2}$ small square Accept any value in the range [62, 70] if B0 awarded in (b)
12	$\frac{1}{4}\times 20$ or 5 or 6 seen	M1	May be implied by $\frac{5}{20}$ or $\frac{6}{20}$
	$\frac{6}{21}$ or $\frac{2}{7}$	A1	oe Accept 0.29 or 29% (or better)
	Additional guidance		
	Decimal answer is 0.285714….		

Q	Answer	Mark	Comments
13	3 × 6 or (total =) 18	M1	Implied by three integers with a sum of 18
	1, 1, 16	A1	May be implied by an answer of 15
	15	A1ft	ft correct calculation of the range of a group of three integers with a sum of 18
	Additional guidance		
	The 'three integers' must be clearly in a group of three		
	If more than one group of 'three integers' is given but all have a sum of 18		M1A0
	0, 0, 18 with no or incorrect range given		M1 A0 A0
	0, 0, 18 with answer = 18		M1 A0 A1ft
	1, 3, 15 with answer = 14		M0 A0 A0
	1, 2, 15 with answer = 14		M1 A0 A1ft
	1, 1, 16 with answer = 14		M1 A1 A0

Q	Answer	Mark	Comments
14	**Alternative method 1**		
	Correct conversion of one value to another form $\frac{5}{12}$ oe fraction or 2 : 3 oe ratio 41.(...)% or 42% or 40% 0.41(...) or 0.42 or 0.4	M1	Accept in words eg 5 out of 12 Accept missing percentage signs
	Box A and correct comparable forms eg $\frac{25}{60}$ and $\frac{24}{60}$ or $\frac{10}{24}$ and $\frac{10}{25}$ or 15 : 21 and 14 : 21 or 41.(...)% or 42% and 40% or 0.41 or 0.42 and 0.4	Q1	oe Strand (ii) Logical argument with steps shown
	Alternative method 2		
	$\frac{2}{5} \times 12$ or 4.8 or $\frac{5}{12} \times 5$ or 2.08... or 2.1	M1	oe
	Box A and 4.8 (and 5) or Box A and 2.08... or 2.1 (and 2)	Q1	oe Strand (ii) Logical argument with steps shown