AQA Qualifications

GCSE

Mathematics

Unit 1: Foundation 43601F

Mark scheme

43601F
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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.
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.
ft	Follow through marks. Marks awarded 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…	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416

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

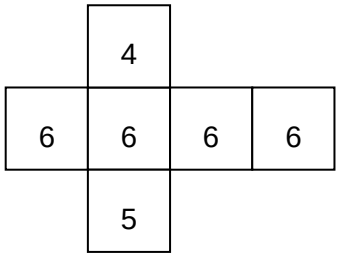
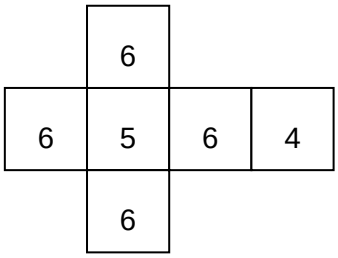
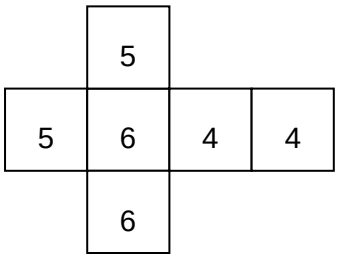
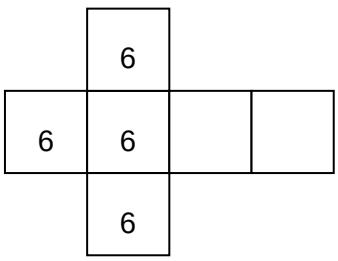
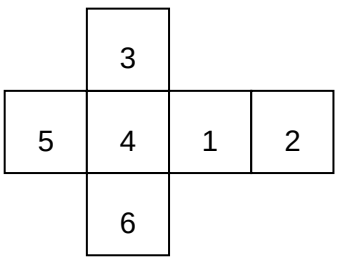
Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the candidate intended it to be a decimal point.

Q	Answer	Mark	Comments
1(a)	Adelaide	B1	
1(b)	Sydney	B1	
1(c)	30 (days)	B2	B1 90 or 60 or 1.5 or $1\frac{1}{2}$ seen Answer/working may be alongside pictograms
1(d)	Two valid comparisons of Melbourne with Perth	B2	eg Perth had more sunny days than rainy days but Melbourne had more rainy days than sunny days B1 One valid comparison of Melbourne with Perth eg Perth had more sunny days than Melbourne
	Additional Guidance		
	Must be comparing Melbourne with Perth, possibly implied eg Melbourne had more rainy days. Perth had the most sunny days.		B2
	Accept poor spelling and any unambiguous representation of Melbourne and Perth, eg M and P		
	Any comparison must be correct eg Perth has 80 more sunny days than Melbourne		B0
	Ignore any non-contradictory statements		

Q	Answer	Mark	Comments
2(a)	evens	B1	
2(b)	unlikely	B1	

Q	Answer	Mark	Comments
2(c)	Diagram complete with four 6s, one 4 and one 5 but in any order eg  	B2	B1 an equal number of 4s and 5s or four or five 6s
	Additional Guidance		
	eg  		B2
	eg  		B1 (equal 4s and 5s)
	If one of the conditions is met for B1, ignore other wrong or missing numbers eg   		B1 for either

Q	Answer	Mark	Comments
3	Bar A at height 35	B1	Must be fully correct (35, 25, 30, 10) with equal width bars and equal gaps to award B4 Condone unequal width bars and no or unequal gaps for up to B3 SC2 for B = 25, C = 30 and D = 10 seen
	Bar B at height 25	B1	
	Bar C 20 higher than bar D	B1	
	Bars total 100	B1	
	Additional Guidance		
	For unruled lines mark the intention		
	Only apply SC2 if no more than one B1 has scored		
	Ignore any shading		

Q	Answer	Mark	Comments
4(a)	**Alternative method 1**		
	131 + 163.75 + 117.9(0) + 170.3(0) or 582.95 or 104.8(0) + 144.1(0) + 117.9(0) + 131 or 497.8(0)	M1	131 + 163.75 + 170.3(0) or 465.05 or 163.75 + 117.9(0) + 170.3(0) or 451.95 or 163.75 + 170.3(0) or 334.05 or 104.8(0) + 144.1(0) + 131 or 379.9(0) or 104.8(0) + 144.1(0) + 117.9(0) or 366.8(0) or 104.8(0) + 144.1(0) or 248.9(0)
	85.15	A1	Allow £85.15p
	Alternative method 2		
	131 – 104.8(0) or 26.2(0) or 163.75 – 144.1(0) or 19.65 or 170.3(0) – 131 or 39.3(0)	M1	
	85.15	A1	Allow £85.15p
	Additional Guidance		
	Two of the wages are the same in March and April so either or both can be ignored when comparing (see RHS of Alt 1).		

Q	Answer	Mark	Comments
4(b)	0.12 × 560 or 67.2	M1	oe
	67.20	Q1	Strand (i) Correct money notation SC1 492.80
	Additional Guidance		
	£67.20p		M1Q0
	If a build-up method is used then a full method must be shown if any arithmetic error(s) occur		
5(a)	(JKLM) (J)KML (J)LKM (J)LMK (J)MKL (J)MLK	B2	Accept any unambiguous representation of each person Condone a repeat of (J)KLM for B2 or B1 For B2 there must be no other repeats or incorrect arrangements B1 for 3 or 4 new arrangements Ignore repeats and incorrect arrangements for B1
5(b)	$\frac{2}{3}$ or $\frac{4}{6}$	B1ft	oe fraction, decimal or percentage ft their arrangements Accept 0.66 or 0.67 or better
	Additional Guidance		
	Ignore subsequent cancelling or change of form once correct answer is seen		
	Only apply a follow through if B1 or B0 is scored in part (a)		

Q	Answer	Mark	Comments
6(a)	7 7 9	B1	Any order
	Additional Guidance		
	If the cards are left blank, accept an unambiguous answer written elsewhere		B1
6(b)	(Total =) 15	M1	May be implied by selecting three numbers that total 15
	2 4 9	A1	Any order SC1 the mean of any three numbers correctly calculated
	Additional Guidance		
	If the cards are left blank, accept any unambiguous working or answer written elsewhere for one or two marks		
6(c)	7 7 10 14	B2	Any order B1 Any **four** numbers with a median of 8.5 or Any **four** numbers with a mode of 7
	Additional Guidance		
	If the cards are left blank, accept an unambiguous answer written elsewhere		B2
	If one, two or three of the cards are left blank, B1 may be scored in the working		
	For the B1, the numbers do not have to be from the given cards		
	Do not allow two modes eg 4 4 7 7 eg 7 7 10 10 (scores for the median only)		 B0 B1

Q	Answer	Mark	Comments
7(a)	Any two of the three valid criticisms ie the overlap the options not being exhaustive the lack of a time frame	B2	B1 Any one valid criticism eg If you had stayed in 3 which box would you tick? Some people might have stayed in more than 14 Should say 'How many hotels have you stayed at in the last week/year'
	Additional Guidance		
	Do not accept the same criticism repeated eg 1 There is no box for 15 2 There is no box for 16		B1 B0
	Ignore irrelevant statements		
	Ignore criticisms of the question (other than lack of time frame)		
	The numbers collide 0 – 3, 3 – 6		B1
	No box for Other		B1
	No box for Don't know		B1
	There is a gap		B1
	They assume everyone has stayed in a hotel and it doesn't have an option for over 14 (ignore any non-contradictory statement)		B1
	There are not enough boxes		B0
	The boxes are wrong		B0

Q	Answer	Mark	Comments
7(b)	Suitable response section covering 0 to 7, exhaustive, no overlaps, with at least 3 separate numerical choices	B1	
	Additional Guidance		
	Interpret box labelled eg 5+ in favour of the student		
	Ignore boxes that extend beyond 7 and do not count them eg 0 – 2, 3 – 5, 6 – 8 0 – 5, 6 – 10, 11 – 15		 B1 B0
	Ignore boxes labelled Other and Not sure etc		
	A box including 0 with another box labelled None (oe) is an overlap		B0
	If inequalities are used they must be correct.		
	Allow tally table even if filled in		
	Boxes (oe) for 0 oe, 1, 2, 3, 4, 5, 6, 7		 B1
	Boxes (oe) for Mon, Tues, Wed, Thurs, Fri, Sat, Sun		 B0
8(a)	60 ÷ 20 or 3 or 20 ÷ 60 or 0.33... or 165 ÷ 60 or 2.75 or 60 ÷ 165 or 0.36...	M1	oe
	55	A1	
	Additional Guidance		
	Allow 15(°) = 5 (animals) as 15 is a common factor of 165 and 60		M1
	If a build-up method is used then a full method must be shown if any arithmetic error(s) occur		

Q	Answer	Mark	Comments
8(b)	**Alternative method 1**		
	360 – 165 – 60 or 135	M1	Angle for cows May be on diagram
	their 135 ÷ 360 (× 100) or 0.375	M1dep	oe Proportion of cows
	37.5	A1	Accept 38 with method
	Alternative method 2		
	60 ÷ 360 (× 100) or 0.166(6..) or 16.6(6..) (%) **and** 165 ÷ 360 (× 100) or 0.458(3..) or 45.8(3..) (%) or (60 + 165) ÷ 360 or 0.625	M1	Proportions of chickens and sheep oe May be on diagram
	(1 – their 0.1666... – their 0.4583...) (× 100) or their 16.66... + their 45.83... or (60 + 165) ÷ 360 × 100 or 62.5 (%)	M1dep	Proportion of cows oe Percentage of chickens and sheep
	37.5	A1	Accept 38 with method

Q	Answer	Mark	Comments
8(b) cont.	**Alternative method 3**		
	20 ÷ 60 × 360 or their 55 ÷ 165 × 360 or 120 (animals) or 45 (cows)	M1	May be on diagram oe Number of animals or cows
	(their 120 – their 55 – 20) ÷ their 120 (× 100) or their 45 ÷ their 120 (× 100) or 1 – (their 55 + 20) ÷ their 120 or 0.375 or (their 55 + 20) ÷ their 120 × 100 or 62.5 (%)	M1dep	Proportion of cows oe Percentage of chickens and sheep
	37.5	A1	Accept 38 with method
	Additional Guidance		
	0.625		M1
	62.5 or 0.375		M1M1
	Accuracy lost through truncation or rounding is only penalised in the final mark		

Q	Answer	Mark	Comments
9(a)	2 × 9 or 18 or 3 × 2 or 6	M1	
	68 – 12 – their 18 – their 6 or 32	M1dep	Must be subtracting three products
	8	A1	Answer may be in table
	Additional Guidance		
	8 seen in table with a chosen answer of 32		M1M1A0
9(b)	**Alternative method 1**		
	36(%) or 0.36 or 64 : 36 or 32 : 18	M1	oe
	16 : 9	A1	Accept 1 : 0.5625 or 1 : $\frac{9}{16}$ or $1.\dot{7} : 1$ or $\frac{16}{9} : 1$ SC1 correctly simplifying any given ratio SC1 for simplified ratio in reverse eg 9 : 16
	Alternative method 2		
	$\frac{16}{25}$ or $\frac{9}{25}$ or $\frac{16}{9}$ or $\frac{9}{16}$	M1	Must be simplified fraction
	16 : 9	A1	Accept 1 : 0.5625 or 1 : $\frac{9}{16}$ or $1.\dot{7} : 1$ or $\frac{16}{9} : 1$ SC1 correctly simplifying any given ratio SC1 for simplified ratio in reverse eg 9 : 16
	Additional Guidance		
	16 : 9 seen then answer 4 : 3		M1A0
	16% : 9%		M1A0

Q	Answer	Mark	Comments
10(a)	Positive	B1	Ignore any indication of strength eg weak
10(b)	7	B1	Accept any answer in range [6.8, 7.2]

11(a)	Appropriate key	B1	
	Stem 2, 3, 4, 5	B1	or 5, 4, 3, 2
	Leaves correct and ordered 1 4 9 2 5 6 8 8 9 0 3 7 8 2 6	B1	Must match the order of their stem if present eg if 5, 4, 3, 2 leaves should be 6 2 8 7 3 0 9 8 8 6 5 2 9 4 1
	Appropriate alignment of leaves	Q1ft	ft their single digit leaves Strand (ii) Logical organised working so row lengths show the distribution
	Additional Guidance		
	For the Q mark: • Leaves may be unordered and/or incorrect (but need at least 13) • Leaves must be single digit • Lengths of rows need to correspond to *their* number of leaves ie row with most leaves should be longest etc		
	The Q mark is independent so B0B0B0Q1ft is possible		
	Ignore eg lines between numbers which may be working for 11b and commas		
	If not crossed out and replaced, mark the stem-and-leaf on the grid		

Q	Answer	Mark	Comments
11(b)	**Alternative method 1**		
	11 × 10 or 110 or 2 × 20 or 40	M1	oe Implied by 4.40 or 440 or 1.60 or 160
	(their 110 + their 40) × 0.04 or (their 110 + their 40) × 4 or 600	M1dep	oe
	6	A1	
	Alternative method 2		
	10 × 0.04 or 0.4 or 10 × 4 or 40 or 20 × 0.04 or 0.8 or 20 × 4 or 80	M1	oe Allow 30 × 4 or 1.20 or 120 for M1 only
	their 0.4 × 11 + their 0.8 × 2 or their 40 × 11 + their 80 × 2 or 600	M1dep	oe
	6	A1	
	Additional Guidance		
	(Total points =) 150 scores the first mark		M1
	13 × 10 + 2 × 20 = 170 170 × 4 = 680 £6.80		M1 M1dep A0
12(a)	17	B1	

Q	Answer	Mark	Comments
12(b)	4 or 5 correct plots	M1	(25, 5), (35, 13), (45, 9), (55, 6), (65, 2) $\pm\frac{1}{2}$ small square Accept 5 points plotted at the correct heights consistently on the lower bound or upper bound for M1 only
	5 correct plots joined with straight lines to form a frequency polygon	A1	$\pm\frac{1}{2}$ small square
	Additional Guidance		
	Accept unruled lines if intention for straight lines is clear		M1A1
	Bar chart and frequency polygon drawn – mark frequency polygon		
	Bar chart only		M0
	Ignore other points or lines before first plot and after final plot and a line joining first and last plot		
13	$\frac{3}{25} \times 100$ or 12	M1	oe Allow $\frac{12}{100}$ or 12%
	$\frac{1}{10} \times (100 - 20)$ or 8	M1	oe Allow $\frac{8}{80}$
	4	A1	
	Additional Guidance		
	$(\frac{3}{25} - \frac{1}{10}) \times 100$		M1 M0 A0
	$(\frac{3}{25} - \frac{1}{10}) \times 80$		M0 M1 A0