AQA Qualifications

GCSE
MATHEMATICS (LINEAR)

4365/2F

Mark scheme

4365

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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.

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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.
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.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
oe	Or equivalent. Accept answers that are equivalent. e.g. accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.
[*a*, *b*)	Accept values $a \leq$ value $< b$
25.3 …	Allow answers which begin 25.3 e.g. 25.3, 25.31, 25.378.
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

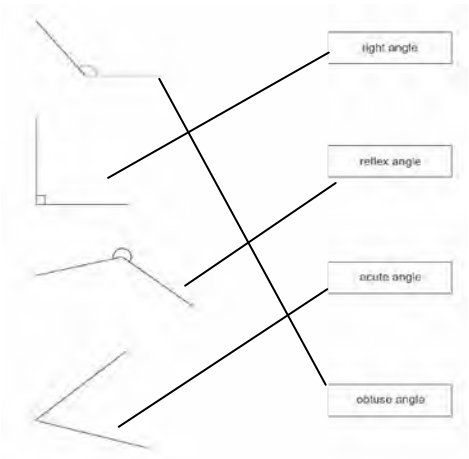
Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

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

Paper 2 Foundation Tier

Q	Answer	Mark	Comments
1(a)	431	B1	
1(b)	388	B1	
1(c)	293 and 107	B1	In any order
1(d)	255 and 205	B1	Must be in order
2(a)	Sight of one five bar gate	B1	
	All three tallies correct	B1	
	All three frequencies correct	B1ft	ft their tallies
2(b)	Suitable vertical scale with equal increments	B1	
	Bars on horizontal axis labelled	B1	
	Three correct bars with equal gaps	B2ft	ft their scale B1 for one or two bars of correct height (condone no or unequal gaps, and unequal widths) B1 for a vertical line graph with three correct heights SC2 for correct bar chart with labels for Chocolate (5), Vanilla (6) and Strawberry (4) with no more than one error
3(a)	16	B1	
	24 and 32	B1ft	ft their 16 + 8 and their 24 + 8
3(b)	56	B1	

Q	Answer	Mark	Comments
4(a)	*A, D* and *E*	B2	any order B1 for 2 correct or for 2 correct and 1 incorrect
4(b)	*C* and *E*	B2	any order B1 for 1 correct or for 1 correct and 1 incorrect
4(c)	*B*	B1	
5	Angles joined with obtuse right – angle reflex acute in this order  	B2	B1 for two or three correct

Q	Answer	Mark	Comments
6(a)	2.48	B1	
6(b)	2.61 or 3.15 or 5.76	B1	
	10 – their 5.76	M1	oe
	4.24	A1	SC2 3.24
7(a)	58.9 + 21.5 or 80.4	M1	oe
	80.40	Q1	strand (i) correct money notation
7(b)	187.6 ÷ 46.9	M1	4 × 46.9 (=187.6) seen
	4	A1	
7(c)	One addition involving at least two prices with the correct answer or One subtraction from 89.9 with the correct answer	M1	
	(junior,) junior and over 65	A1	(21.5), 21.5 and 46.9

Q	Answer	Mark	Comments
8(a)	8 × 7 or 56	M1	
	8 × 7 + 20 or their 56 + 20	M1dep	
	76	A1	SC2 for 216 or 196
8(b)	**Alternative Method 1**		
	Any correct trial for [1, 20] hours	M1	eg 8 × 1 + 10 = (£)18
	A second correct trial for [1, 20] hours	M1dep	
	15	A1	
	Alternative Method 2		
	Any correct trial for subtracting bonus and dividing by the number of hours	M1	eg 150 – 40 = 110 110 ÷ 8 = 13.75
	A second correct trial for subtracting bonus and dividing by the number of hours	M1dep	
	15	A1	
9	6 by 4 rectangle	B2	B1 for a rectangle with perimeter 20 cm B1 for a rectangle with area 24 cm^2
10(a)	London	B1	Accept – 4.9 (^oC)
10(b)	10.5	B1	Accept – 10.5
10(c)	– 5.9	B1	

Q	Answer	Mark	Comments
11	$\frac{3}{5} \times 900$ or 900 ÷ 5 or 180	M1	oe
	540	A1	
12(a)	24	B1	
12(b)	7.5(26…)	B1	
12(c)	6.25 or $6\frac{1}{4}$ or $\frac{25}{4}$	B1	
13	0.65 or 0.64	M1	oe 65(%) or 64(%) 325 and 320
	Geography or $\frac{13}{20}$ and e.g. 0.65 and 0.64	A1	must see a comparison for A1

Q	Answer	Mark	Comments
14	**Alternative Method 1**		
	51 + 34 + 30 + 17 or 132	M1	
	(0) + 8 + 20 + 43 + 37 + 51 + 34 + 30 + 17 or their 132 + 8 + 20 + 43 + 37 or their 132 + 108 or 240	M1	
	$\frac{60}{100}$ × their 240	M1	$\frac{\text{their } 132}{\text{their } 240}$ × 100
	144	A1	55 (%)
	No stated or implied	Q1ft	Strand (iii) Correct conclusion for their values dependent on method marks.
	Alternative Method 2		
	8 + 20 + 43 + 37 or 108	M1	
	(0) + 8 + 20 + 43 + 37 + 51 + 34 + 30 + 17 or their 108 + 51 + 34 + 30 + 17 or their 108 + 132 or 240	M1	
	$\frac{40}{100}$ × their 240	M1	$\frac{\text{their } 108}{\text{their } 240}$ × 100
	96	A1	45 (%)
	No stated or implied	Q1ft	Strand (iii) Correct conclusion for their values dependent on method marks.

Q	Answer	Mark	Comments
15(a)	– 7	B1	
	5	B1	
15(b)	At least 2 points correctly plotted	M1	May be implied from a correct line
	Straight ruled line drawn from – 3 to 3	A1	$\pm \frac{1}{2}$ square tolerance
16(a)	7.5 (cm)	B1	[7.4, 7.6]
	their 7.5 × 25	M1	their 7.5 must be ≤ 11
	[185, 190]	A1ft	ft their 7.5 cm
16(b)	Correct bearing seen or implied	M1	Line or point
	Point marked	A1	2 mm tolerance
17(a)	$\frac{11}{50}$ or 0.22	B2	oe B1 for numerator 11 or denominator 50 or 11 out of 50 or 11 in 50 Ignore fw
17(b)	1 × 9 (+) 2 × 12 (+) 3 × 18 (+) 4 × 7 (+) 5 × 4 or 9 (+) 24 (+) 54 (+) 28 (+) 20	M1	oe Allow one error May be in table
	135	A1	

Q	Answer	Mark	Comments
18(a)	$4a + 2b$	B2	B1 for each term Do not ignore further incorrect working for B2
18(b)	$4x = 11 + 7$	M1	$\frac{11+7}{4}$
	4.5	A1	oe
19	$\frac{30}{20}$ or 1.5 seen or implied or 180 + 90 or 270 or 150 + 75 or 225 or 200 + 100 or 300 or 4 + 2 or 6	M1	oe
	Two from 270 or 225 or 300 or 6	A1	
	270 and 225 and 300 and 6	A1	

Q	Answer	Mark	Comments
20	$\frac{1}{6}$	B1	oe decimals 0.16… or 0.17
	2, 4 or 4, 2 or 3, 3 or 1, 5 or 5, 1 or 36 combinations seen or implied or $\frac{1}{6} \times \frac{1}{6}$ or $\frac{1}{36}$ or states or implies one of the ways of scoring 6	M1	oe decimals 0.027…
	2, 4 and 4, 2 and 3, 3 and 1, 5 and 5, 1 or $\frac{1}{6} \times \frac{1}{6} \times 5$ or states or implies there are 5 ways of scoring 6	M1dep	
	$\frac{5}{36}$	A1	oe decimals 0.138… or 0.14
	B (Correct conclusion for their probabilities)	Q1ft	Strand (iii) Both method marks awarded and probabilities shown ft their probabilities
21(a)	Correct reflection	B2	B1 for a reflection in any line parallel to an axis B1 for correct vertices plotted but no triangle
21(b)	Fully correct enlargement drawn	B3	B2 for enlargement with SF4 or for any enlargement centre (1,1) or for 5 correct vertices plotted but no pentagon or for 4 correct vertices and 1 incorrect plotted and pentagon drawn B1 for any enlargement or one side of correct length

Q	Answer	Mark	Comments
22	**Alternative Method 1**		
	$\frac{1}{2} \times 5 \times 5$ or 12.5 or $\frac{1}{2} \times 10 \times 5$ or 5 × 5 or 25	M1	oe area of any triangle
	$4 \times \frac{1}{2} \times 5 \times 5$ or $2 \times \frac{1}{2} \times 10 \times 5$ or 25 × 2 or $\frac{1}{2} \times 10 \times 10$ or 5 × 10	M1dep	oe
	50	A1	
	Alternative Method 2		
	$5^2 + 5^2$ or $\sqrt{5^2+5^2}$ or $\sqrt{50}$	M1	oe Accept 7.07... or 7.1 for $\sqrt{50}$
	$(\sqrt{50})^2$	M1dep	oe Accept 7.07... or 7.1 for $\sqrt{50}$ in $(\sqrt{50})^2$
	50	A1	Condone 49.9...
23(a)	$\frac{15+30}{2} \times 20$	M1	oe
	450	A1	
23(b)	their 450 × 95	M1	
	42750	A1ft	ft their 450

Q	Answer	Mark	Comments
24	$\frac{20}{100} \times 130$ or 26 or 1.2 seen or $\frac{1}{4} \times 195$ or 48.75 or $\frac{3}{4}$ seen	M1	 or $\frac{1}{4} \times 200$ or 50
	130 + their 26 or 1.2 × 130 or $\frac{3}{4} \times 195$ or 195 – their 48.75	M1dep	oe or $\frac{3}{4} \times 200$ or 200 – their 50
	 130 + their 26 or 1.2 × 130 and $\frac{3}{4} \times 195$ or 195 – their 48.75 or 156 or 146.25 or 146	M1dep	oe 130 + their 26 or 1.2 × 130 and $\frac{3}{4} \times 200$ or 200 – their 50 or 156 or 150
	156 and 146.25 or 156 and 146	A1	156 and 150
	Just bykes	Q1ft	Strand (iii) ft their 156 and their 146.25 or 146 or 150 provided both methods are fully correct

Q	Answer	Mark	Comments
25	(Median =) $\frac{2x+6x}{2}$ or $4x$ (= 12) seen	M1	oe
	x = 3	A1	oe
	3, 6, 18 and 33 seen or their 3 + 2(their 3) + 6(their 3) + 11(their 3) or their 3, 6, 18 and 33 seen or (Mean =) $\frac{x+2x+6x+11x}{4}$	M1	Allow one error
	$\frac{3+6+18+33}{4}$ or $\frac{20x}{4}$ or $5x$ or their $5x$ or (their 3 + 2(their 3) + 6(their 3) + 11(their 3)) ÷ 4	M1dep	
	15	A1ft	ft 5 × their x value
26	12 ÷ 2 or 6	M1	
	12 ÷ 4 or 6 ÷ 2 or 3	M1dep	
	π × 3 × 3	M1dep	oe
	9π or [28.2, 28.3] or 28	A1	SC2 for 36π or [113, 113.2]