

# GCSE

# MATHEMATICS (LINEAR)

4365/1F

Mark scheme

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Version 1.0 Final

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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](http://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.

<b>M</b>	Method marks are awarded for a correct method which could lead to a correct answer.
<b>A</b>	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>B</b>	Marks awarded independent of method.
<b>Q</b>	Marks awarded for quality of written communication.
<b>M dep</b>	A method mark dependent on a previous method mark being awarded.
<b>B dep</b>	A mark that can only be awarded if a previous independent mark has been awarded.
<b>ft</b>	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
<b>SC</b>	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
<b>oe</b>	Or equivalent. Accept answers that are equivalent. e.g. accept 0.5 as well as $\frac{1}{2}$
<b>[a, b]</b>	Accept values between $a$ and $b$ inclusive.
<b>[a, b)</b>	Accept values $a \leq \text{value} < b$
<b>25.3 ...</b>	Allow answers which begin 25.3 e.g. 25.3, 25.31, 25.378.
<b>Use of brackets</b>	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.

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## Paper 1 Foundation Tier

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>1(a)</b>	radius	B1	
<b>1(b)</b>	chord	B1	
<b>1(c)</b>	tangent	B1	

Q	Answer	Mark	Comments
<b>2(a)</b>	<b>Alternative Method 1</b>		
	40 or 50 or 35 or 20 or 25 or 17 (coins) or $16 + \frac{1}{2} + \frac{1}{2}$ (coins)	B1	May be implied
	their 40 + their 50 + their 35 + their 20 + their 25 or their $17 \times 10$ or their $16 \times 10 + 5 + 5$ or $200 \div 10$	M1	
	170 or 20 (coins needed)	A1	
	Correct conclusion based on their total money raised or on their total coins and their coins needed	Q1ft	Strand (iii) ft correct conclusion based on their values if B1M1 awarded
	<b>Alternative Method 2</b>		
	40 or 50 or 35 or 20 or 25	B1	May be implied
	Total build up method eg 10, 20, 30, 40, ..., 170 or 40, 90, 125, 145, 170	M1	Allow one error or omission of one coin
	170	A1	
	Correct conclusion based on their total money raised	Q1ft	Strand (iii) ft correct conclusion based on their total if B1M1 awarded

Q	Answer	Mark	Comments
2(b)	$70 \div 4$ or $7 + 7 + 3.5$ or $0.25 \times 70$	M1	oe
	17.50	Q1	Strand (i) 17.5 is M1 Q0
3	<b>Alternative method 1</b>		
	$5(.00) - 2.6(0)$ or $2.4(0)$ or 240	M1	May be implied
	their $240 \div 80$ or builds up to their 240 eg $80 + 80 + 80$ or $3 \times 80$	M1	oe
	3	A1	Must see correct method SC2 Answer only of 3
	<b>Alternative method 2</b>		
	$2.60 + 80$ or $5(.00) - 80$	M1	
	$2.60 + 80 + 80 + 80$ or $5(.00) - 80 - 80 - 80$	M1	
	3	A1	Must see correct method SC2 Answer only of 3
4(a)	36	B1	

Q	Answer	Mark	Comments
<b>4(b)</b>	Yes and $3 \times 40$ and $4 \times 30$ Yes and $12 \times 10$ or Yes and in 12 times table or Yes and 3 and 4 are factors of 120 or Yes and both lists correctly written out up to 120 or No because 20 is missing	B1	oe eg it divides by 12 it's in both times tables 3 and 4 go into 120
<b>5(a)</b>	772	B1	
<b>5(b)</b>	176	B1	
<b>5(c)</b>	700	B1	
<b>5(d)</b>	40	B1	
<b>6(a)</b>	$(38 - 3) \div 5$ or $35 \div 5$ or $38 \div 5$ or $7 \times 5 = 35$ (+ 3 = 38) or 7r3	M1	
	7	A1	
<b>6(b)</b>	2	B1	
<b>6(c)</b>	2 and 19	B1	




Q	Answer	Mark	Comments
7(a)	180	B1	Exact answer
7(b)	6	B1	
7(c)	135	B1	Exact answer
8	$(7^2 - 7 \times 5) = 14$ $(9^2 - 9 \times 7) = 18$ $12^2 - 12 \times 10 = 24$	B4	B3 for 5 correct entries B2 for 3 or 4 correct entries B1 for 1 or 2 correct entries
9	210 – 90 or 120	M1	
	their 120 ÷ 4	M1dep	oe
	30(.00)	A1	
10(a)	Kilogram(s), Tonne(s), Ton(s) or Stone(s)	B1	Accept T, kg Ignore any numerical estimate alongside correct unit eg accept 2 tonnes
10(b)	Centimetre(s), millimetre(s) or inch(es)	B1	Accept cm, mm or in Ignore any numerical estimate alongside correct unit eg accept 15 mm
11(a)	25	B1	Embedded ie $25 - 7 = 18$ B0
11(b)	An equation whose solution is 8	B1	Equation does not have to be linear eg $x^2 = 64$ Accept $x = 8$

Q	Answer	Mark	Comments
11(c)	Two values where $b - a = 10$	B2	Accept 0, negative numbers and non-integers B1 for any two values where $a + b = 10$ or for any two values where $a - b = 10$ B1 $10 + a = b$ oe seen
12	Any two points of the form $(x, 2x + 1)$ except $(-2, -3)$ and $(-4, -7)$	B2	B1 any one correct point
13	$(180 - 40) \div 2$ or $180 - (40 \times 2)$	M1	
	(40 and) 40 and 100	A1	Either order
	(40 and) 70 and 70	A1	SC1 Two pairs of angles totalling 140
14(a)	Expression	B1	
14(b)	Equation and/ or Formula	B1	
15	An angle of [38, 42]	M1	Condone not at A
	An angle of [53, 57]	M1	Condone not at B
	AC and BC drawn on AB = 12 cm with an angle of [38, 42] at A and an angle of [53, 57] at B	A1ft	ft AC and BC drawn on AB = 12 cm with an angle of [38, 42] at A or an angle of [53, 57] at B

Q	Answer	Mark	Comments
16	<b>Alternative Method 1</b>		
	(CD = £) $45 - 35$ or 10 or $2d + c = 35$ <b>and</b> $2d + 2c = 45$	M1	
	(35 – their 10) $\div$ 2 or $(45 - 2 \times \text{their } 10) \div 2$ or $22.5 - \text{their } 10$ or $12.5(0)$ or finds a pair of values that satisfy one of the statements	M1	Condone missing brackets
	$3 \times \text{their } 10 + \text{their } 12.5(0)$	M1dep	dep on second M
	42.5(0) or 7.5(0) remaining	A1	
	Correct conclusion based on their total	Q1ft	Strand (iii) ft correct conclusion based on their total if <b>two</b> Ms awarded <b>NB</b> the difference between the cost of 3 CDs and 50 may be calculated and compared to the cost of a DVD to reach a conclusion eg $50 - 3 \times 10 = 20 > 12.5$ so Yes is full marks
	<b>Alternative Method 2 (Trial and Improvement)</b>		
	Chooses a value for CD and DVD and tests in <b>both</b> statements	M1	
	Chooses a new value for CD or DVD or both and tests in <b>both</b> statements	M1dep	
	Finds a pair of values for CD and DVD that the student thinks works in both statements and calculates $3 \times \text{their CD} + \text{their DVD}$	M1dep	
	42.5(0)	A1	
	Correct conclusion based on their total	Q1ft	Strand (iii) ft correct conclusion based on their total if <b>three</b> Ms awarded

Q	Answer	Mark	Comments
17(a)	Four different numbers in any order with median 5 and range 7 eg 1, 4, 6, 8 9, 6, 4, 2 3, 10, 6, 4 1, 3, 7, 8 2, 3, 7, 9 0, 4, 6, 7 1.5, 4, 6, 8.5 -1, 4.5, 5.5, 6	B2	B1 Four numbers in any order with median 5 and range 7 with repeats eg 4, 4, 6, 11 3, 3, 7, 10 1, 5, 5, 8 5, 5, 4, 11 5, 5, 5, 12 B1 Four <b>different</b> numbers in any order with median 5 <b>or</b> range 7
17(b)	$7 \times 6$ or 42 or $8 \times 9$ or 72 or $9 \times 4$ or 36 or $10 \times 1$ or 160 (their 42 + their 72 + their 36 + their 10) $\div$ 20 8	M1 M1 dep A1	At least one product shown or one correct value (not 10) Must have the sum of 4 products divided by 20 Condone missing brackets $(7 \times 6 + 8 \times 9 + 9 \times 4 + 10 (\times 1)) \div 20$ is M2
18(a)	$5 \times 8$ 40 cm <sup>2</sup>	M1 A1 B1	oe eg $\frac{1}{2}(8 + 8) \times 5$

Q	Answer	Mark	Comments
18(b)	<p>Any <b>quadrilateral</b> that has neither line nor rotational symmetry ie</p> 	B1	<p>Rotations, translations and reflections of these</p> <p>Must use dots as vertices</p> <p>Condone internal lines if a clear quadrilateral is outlined</p>
19(a)	0.6 or 60% or $\frac{6}{10}$	B1	oe
19(b)	200 × 0.4	M1	oe
	80	A1	SC1 120 or $\frac{80}{200}$
19(c)	0.75 or 75% or $\frac{150}{200}$	B1	oe

Q	Answer	Mark	Comments
20(a)	6	B2	<p>B1 for answer of 2 or 3 or <math>2 \times 3</math></p> <p>B1 for <math>24 = \{2, 2, 2, 3\}</math> or <math>2 \times 2 \times 2 \times 3</math></p> <p>or <math>42 = \{2, 3, 7\}</math> or <math>2 \times 3 \times 7</math></p> <p>or</p> <p>one pair of factors of 24 (not <math>1 \times 24</math>)                      eg <math>2 \times 12</math>, 3 and 8, <math>24 \div 4 = 6</math> (oe)  <b>and</b> one pair of factors of 42                      (not <math>1 \times 42</math>)                      eg <math>2 \times 21</math>, <math>3/14</math>, (6, 7) (oe)</p> <p>or <math>(24 =) \{1, 2, 3, 4, 6, 8, 12, 24\}</math></p> <p>or <math>(42 =) \{1, 2, 3, 6, 7, 14, 21, 42\}</math></p>
20(b)	48 as a correct product (except $1 \times 48$ ) eg $2 \times 24$ or $3 \times 16$ or $6 \times 8$ or $2 \times 3 \times 8$ or (2, 24) or (1, 2, 3, 8) etc	M1	oe eg $48 \div 2 = 24$ or branches on a prime factor tree showing at least one product or factor ladder showing a correct division  Ignore incorrect products if at least one correct product seen
	$2 \times 2 \times 2 \times 2 \times 3$ or $2^4 \times 3^{(1)}$ or $2^3 \times 2 \times 3^{(1)}$ or $2^2 \times 2^2 \times 3^{(1)}$	A1	