GCSE

Mathematics (Linear)

Foundation Tier Paper 2

Mark scheme

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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.

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 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. 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 ≤ value < b
3.14 …	Accept answers which begin 3.14 e.g. 3.14, 3.142, 3.1416
Q	Marks awarded for quality of written communication
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

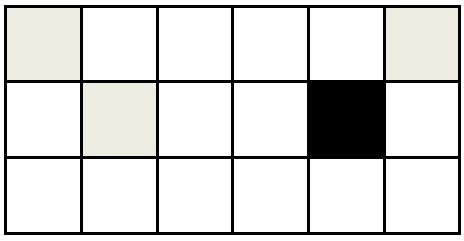
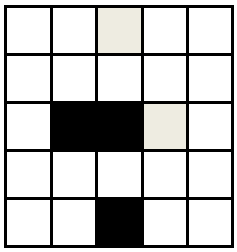
Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

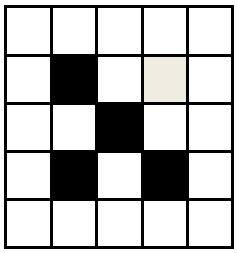
Paper 2 Foundation Tier

Q	Answer	Mark	Comments
1(a)	270^{o}	B1	
1(b)	South-West	B1	
2(a)	kilometres and miles	B2	B1 each
2(b)	grams and ounces	B2	B1 each
2(c)	2000 ml and 1.5 litres	B2	B1 each
3(a)	12 × 4 + 8 or 48 seen	M1	
	56	A1	
3(b)	20 ÷ 3.5 or 5.7(…) or 6 or 5 × 3.5 = 17.5 or 6 × 3.5 = 21 or [5, 6] × 3.5 correctly evaluated	M1	oe eg 5.6 × 3.5 = 19.6 5.8 × 3.5 = 20.3
	5	A1	

Q	Answer	Mark	Comments
4(a)	35 or 45 or 40	M1	
	35 × 2 or 70 or 45 × 2 or 90 or 40 × 2 or 80 or 35 + 45 + 40 or 120	M1dep	
	35 × 2 + 45 × 2 + 40 × 2 or 70 + 90 + 80 or 120 × 2	M1dep	
	240	A1	
	Additional Guidance		
	35 + 45 + 40 × 2 = 240 (recovered)		M1M1M1A1
	40 + 45 + 35 × 2 = 155 45 + 40 + 35 × 2 = 155 35 + 45 + 40 × 2 = 160 45 + 35 + 40 × 2 = 160 35 + 40 + 45 × 2 = 165 40 + 35 + 45 × 2 = 165		M1M1M1A0 M1M1M1A0 M1M1M1A0 M1M1M1A0 M1M1M1A0 M1M1M1A0
	Any of the above 6 without an answer scores 2		M1M1M0A0
	155 or 160 or 165 with no working		M0

Q	Answer	Mark	Comments
4(b)	40 or two numbers that add up to 65	B1	
	65 – their 40 or 25 or 6.5 symbols in total	B1	
	4 symbols drawn for Thursday or 2.5 symbols drawn for Friday	B1	
	Fully correct pictogram ie 4 symbols drawn for Thursday and 2.5 symbols drawn for Friday	B1	
	Additional Guidance		
	The number of symbols implies the number, eg 4 symbols implies 40 2½ symbols implies 25		
	Fully correct pictogram with no working		B1B1B1B1
	6½ symbols in total with no other working		B1B1B0B0
	4 symbols drawn for Thursday with no other working		B1B0B1B0
	2.5 symbols for Friday with no other working		B0B1B1B0
	Accept a different symbol if key is redefined but candidates cannot score the fourth mark if a different symbol is used and key is not redefined		
	Half circle can be with or without a diameter and can be in any orientation		
5(a)	1357	B1	
5(b)	73 ÷ 5	B1	

Q	Answer	Mark	Comments
5(c)	53 × 7 = 371	B2	B1 for a correct calculation using 3, 5 and 7 or for 53 × 7 or 371
	Additional Guidance		
	35 × 7 = 245 37 × 5 = 185 57 × 3 = 171 75 × 3 = 225 73 × 5 = 365		B1 B1 B1 B1 B1
	For B2 correct answer must be in the boxes, or clearly identified		
	For B1 accept any correct calculation (ignore incorrect calculations) using 3, 5 and 7 (does not have to be in the boxes)		
6(a)		B1	
6(b)		B2	B1 for the middle square shaded or for the other two squares shaded

Q	Answer	Mark	Comments
6(c)		B2	B1 for the middle square shaded or for the other three squares shaded or for a plus sign
7(a)	[8, 9]	B1	

Q	Answer	Mark	Comments
7(b)	Any correct reading	M1	eg tolerance as below 1 m/s → [3, 5] km/h 2 m/s → [6, 8] km/h 3 m/s → [10, 12] km/h 4 m/s → [14, 16] km/h 5 m/s → [17, 19] km/h 6 m/s → [20, 22] km/h 10 m/s → [35, 37] km/h 12 m/s → [42, 44] km/h 15 m/s → [53, 55] km/h 20 m/s → [70, 72] km/h 25 m/s → [89, 91] km/h allow 30 m/s → [107, 109] km/h
	their value × scale factor or a combination with a total of 60 m/s	M1dep	eg [3, 5] × 60 [6, 8] × 30 [10, 12] × 20 [14, 16] × 15 [17, 19] × 12 [20, 22] × 10 [35, 37] × 6 [42, 44] × 5 [53, 55] × 4 [70, 72] × 3 [107, 109] × 2 25 + 25 + 10 = [89, 91] + [89, 91] + [35, 37] 15 + 20 + 25 = [53, 55] + [70, 72] + [89, 91]
	[200, 240] with no readings out of tolerance and correct scale factor if used	A1	

Q	Answer	Mark	Comments

7(b)	**Additional Guidance**	
	For any correct reading the m/s value and the km/h value must be equated; this can be implied by vertical/horizontal lines drawn on the graph	
	25 m/s = 90 km/h, 20 m/s = 72 km/h, 15 m/s = 56 km/h (2 correct readings) 90 + 72 + 56 (correct build up but 56 is out of tolerance) 218	M1 M1 A0
	4 m/s = 15 km/h (correct reading) 15 km/h × 14 (incorrect scale factor) 210	M1 M0 A0

8(a)	40.5 – 18 or 22.5	M1	
	22.50	Q1	Strand (i) correct money notation

8(b)	28 × 5 or 140 or 31.5 + 40.5 + 27 + 18 or 117	M1	oe
	their 140 – (31.5 + 40.5 + 27 + 18) or their 140 – their 117	M1dep	oe
	23	A1	SC1 for a correctly evaluated trial
	Additional Guidance		
	Condone missing brackets		
	Beware 117 ÷ 5 = 23.4, answer = 23		M1M0A0
	(31.5 + 40.5 + 27 + 18 + 20) ÷ 5 = 27.4 31.5 + 40.5 + 27 + 18 + 20 ÷ 5 = 27.4 (117 + 20) ÷ 5 = 27.4 117 + 20 ÷ 5 = 27.4 137 ÷ 5 = 27.4		SC1 SC1 SC1 SC1 M0

Q	Answer	Mark	Comments
9(a)	<table><tr><th>+</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr><tr><th>1</th><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><th>2</th><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><th>3</th><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><th>4</th><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr></table>	B2	B1 for one correct row

Q	Answer	Mark	Comments
9(b)	Denominator 24 seen or implied	M1	
	$\frac{3}{24}$ or 0.125 or 12.5%	A1ft	oe ft their table in part (a) for numerator
	$\frac{1}{8}$	B1ft	ft their fraction provided it can be simplified
	Additional Guidance		
	Must check the table		
	Answer $\frac{1}{8}$ with no other working shown		M1A1B1
	Table contains 6 numbers less than 4, answer $\frac{1}{4}$		M1A1ftB1ft
	Table contains 6 numbers less than 4, answer $\frac{3}{12}$		M1A1ftB0
	Table contains 6 numbers less than 4, answer 0.25 or 25%		M1A1B0
	Table contains 5 numbers less than 4, answer $\frac{5}{24}$		M1A1B0
	Table contains 6 numbers less than 4, answer $\frac{8}{24} = \frac{1}{3}$		M1A0B1ft
	Table does not contain 9 numbers less than 4, $\frac{9}{24} = \frac{3}{8}$		M1A0B1ft
	Answer 0.125 or 12.5%		M1A1B0
	Table contains 6 numbers less than 4, answer $\frac{1}{6}$		M0A0B0

Q	Answer	Mark	Comments
9(c)	Numerator 11 or identifies all 11 prime numbers or 2, 3, 5 and 7 identified as the prime numbers	M1	ft their table in part (a)
	$\frac{11}{24}$ or 0.458… or 0.46 or 45.8…% or 46%	A1ft	ft their table in part (a)
10	$3a + 3a + a + a = 28$ or $8a = 28$ or $3a + a = 14$ or $4a = 14$	M1	oe $28 \div 8$ or or $14 \div 4$
	3.5 or 10.5	A1	oe
	36.75 or 36.8 or 37	B1ft	oe ft their $a \times 3a$ evaluated correctly SC1 for 147
	Additional Guidance		
	$\frac{14}{4}$		M1A1
	$a = 3.5 = 4$, 4×12, answer 48		M1A1B0

Q	Answer	Mark	Comments
11	**Alternative method 1**		
	$\frac{10}{100} \times 62$ or 6.2 or 1.1 (× 62)	M1	oe
	68.2 or 61.8 or 6.2 and 6	Q1	Strand (ii)
	Alternative method 2		
	$\frac{68 - 62}{62}$ (× 100)	M1	oe
	[9.6%, 9.7%]	Q1	Strand (ii)
	Alternative method 3		
	68 ÷ 1.1	M1	oe
	61.8…	Q1	Strand (ii)
	Additional Guidance		
	10% of 62 = 6.2, 62 + 6.2 = 68		M1Q0
	68 – 6.8 = 61.2		M0Q0
	10% of 62 = 6.2, 10% of 68 = 6.8 (choice unless recovered)		M0Q0

Q	Answer	Mark	Comments
12	**Alternative method 1**		
	One trial evaluated correctly using a total of 5 bars, eg (0 × 72 +) 5 × 49 = 245 or 1 × 72 + 4 × 49 = 268 or 4 × 72 + 1 × 49 = 337 or 5 × 72 (+ 0 × 49) = 360 or 4 × 72 = 288 or 300 ÷ 72 = 4.1(…) or 4.2	M1	oe
	2 × 72 + 3 × 49 = 291 or 3 × 72 + 2 × 49 = 314	M1dep	oe
	2	A1	
	Alternative method 2		
	5 × 49 or 245 or 72 – 49 or 23	M1	5 × 0.49 or 2.45 or 0.72 – 0.49 or 0.23
	(300 – 245) ÷ 23 or 2.39(…) or 2.4	M1dep	(3 – 2.45) ÷ 0.23 or 2.39(…) or 2.4
	2	A1	
	Alternative method 3		
	5 × 72 or 360 or 72 – 49 or 23	M1	5 × 0.72 or 3.6 or 0.72 – 0.49 or 0.23
	(360 – 300) ÷ 23 or 2.6(…)	M1dep	(3.6 – 3) ÷ 0.23 or 2.6(…)
	2	A1	
	Additional Guidance		
	2 × 72 + 3 × 49 = 291 or 3 × 72 + 2 × 49 = 314		M1M1A0

Q	Answer	Mark	Comments
13(a)	3	B1	must be in correct place
	–1	B1	must be in correct place
13(b)	At least two of their points plotted correctly	M1	May be implied from a correct line
	Fully correct straight ruled line drawn from – 2 to 2	A1	$\pm \frac{1}{2}$ square tolerance
	Additional Guidance		
	Ignore incorrect points Correct line implies M1A1 Ignore any line before (–2, 7) and after the point (2, –1) Correct line but not full length implies M1		

Q	Answer	Mark	Comments
14	**Alternative method 1**		
	$1 - \frac{4}{5}$ or $\frac{1}{5}$ or $\frac{4}{5} \times 40$ or 32	M1	oe
	their $\frac{1}{5} \times 40$ or $40 - 32$ or 8	M1dep	oe
	20 ÷ their 8 or 2.5(0)	M1dep	
	96 ÷ their 32 or 3 (– 2.50)	M1	
	50p or £0.50	A1	Correct money notation
	Alternative method 2		
	$1 - \frac{4}{5}$ or $\frac{1}{5}$ or $\frac{4}{5} \times 40$ or 32	M1	oe $\frac{4}{5} \times 40$ or 32
	their $\frac{1}{5} \times 40$ or $40 - 32$ or 8	M1dep	oe 20×4 or 80
	96 ÷ 4 or 24	M1	96 – 80
	24 – 20 or 4 (÷ 8)	M1	16 (÷ 32)
	50p or £0.50	A1	Correct money notation

Q	Answer	Mark	Comments
15(a)	51	B1	

15(b)	123 – 2 or 121 or 11^2 seen	M1	
	11	A1	
	Additional Guidance		
	11 × 11 + 2 (= 123) or 11^2 + 2 (= 123) embedded answer with or without an incorrect answer		M1A0
	$\sqrt{123}$ = 11.09, 11 or $\sqrt{123}$ = 11		M0A0
	T & I follow scheme		

Q	Answer	Mark	Comments
16(a)	Fully correct enlargement	B3	B2 for enlargement SF2, wrong position or for any enlargement centre *P* or for 3 correct vertices plotted but no triangle drawn B1 for any other enlargement not SF1 or for 2 correct vertices plotted
	Additional Guidance		
	Mark intention		

Q	Answer	Mark	Comments
16(b)	**Alternative method 1**		
	Rotation	B1	
	Origin or (0, 0) or *O*	B1	oe
	180 (clockwise) or 180 (anticlockwise) or –180	B1	oe
	Alternative method 2		
	Enlargement and SF –1	B2	
	Origin or (0, 0) or *O*	B1	oe
	Additional Guidance		
	Rotation, (0, 0), 90 then 90		B1B1B0
	Accept 180C for 180 (clockwise)		B1
	Accept ½ turn for 180		B1
	Accept $\begin{pmatrix}0\\0\end{pmatrix}$ for origin		B1
	Enlargement (0, 0)		B0B1
	Allow rotate, rotating, rotational (symmetry)		B1
	Mixed transformations, eg translation of 180 reflection (0, 0)		B0B0B1 B0B1B0
	Do not accept turn for rotation		B0
	Double transformations eg Rotate, translate		B0B0B0

Q	Answer	Mark	Comments
17 Alt 1 Alt 2	**Alternative method 1**		
	300 × 0.19 or 57	M1	oe 300 × 19 or 5700
	$\frac{5}{100}$ × their 57 or 2.85 or 1.05 seen	M1dep	oe $\frac{5}{100}$ × their 5700 or 285 or 1.05 seen
	their 57 + their 2.85 or their 57 × 1.05	M1dep	their 5700 + their 285 or their 5700 × 1.05 or 5985
	59.85	A1	
	Alternative method 2		
	$\frac{5}{100}$ × 0.19 or 0.0095 or 1.05 seen	M1	oe $\frac{5}{100}$ × 19 or 0.95 or 1.05 seen
	their 0.0095 + 0.19 or 1.05 × 0.19 or 0.1995	M1dep	oe their 0.95 + 19 or 1.05 × 19 or 19.95
	their 0.1995 × 300	M1dep	their 19.95 × 300 or 5985 or 1.05 × 19 × 3
	59.85	A1	

Q	Answer	Mark	Comments
17 Alt 3	**Alternative method 3**		
	$\frac{5}{100} \times 300$ or 15 or 1.05 seen	M1	oe
	their 15 + 300 or 1.05 × 300 or 315	M1dep	oe
	their 0.19 × their 315	M1dep	19 × their 315 or 5985
	59.85	A1	
	Additional Guidance		
	Pick out any correct step, eg 300 ÷ 19 × 1.05 300 × 0.5 × 0.19		M1M1M0A0 M1M0M0A0
	Beware, 10% of 19 = 1.90, 5% of 19 = 0.95, 1.90 + 0.95 = 2.85 (Alt 2)		M1M0M0A0
	If a choice of methods is seen, mark the best		

Q	Answer	Mark	Comments
18	**Alternative method 1**		
	$x + 2x + 3x + 60 = 360$	M1	360 – 60 or 300
	$6x + 60 = 360$ or $6x = 300$	M1dep	$\frac{360 - 60}{6}$
	50	A1	
	States that $120 + 50 \neq 180$ or $120 + 50 = 170$	Q1	Strand (ii) oe eg $180 - 120 = 60$ and $60 \neq 50$ $x = 60$ and 50 seen 50 and $130 \neq 120$ seen
	Alternative method 2		
	$x = 180 - 120$ or $x = 60$	M1	May be on diagram in the correct position
	$60 + 2 \times 60 + 3 \times 60 + 60$ or $60 + 120 + 180 + 60$	M1dep	
	420	A1	$3x = 180$ means a straight line
	States that $420 \neq 360$ or States 420 so cannot be a quadrilateral	Q1	Strand (ii) oe Left hand shape is a triangle or Left hand shape is not a quadrilateral

Q	Answer	Mark	Comments
19	140 – 110 90 ÷ 3 or 30 or 1800 is 90° or 1800 × 4 or 7200 seen or 1800 ÷ 90 or 7200 ÷ 360 or 20	M1	oe 90 ÷ 1800 or 0.05° 1800 may be in sector D but must see 90
	1800 ÷ 90 × 140 or 2800 or 1800 ÷ 90 × 110 or 2200 or 1800 ÷ 90 × 20 or 400 or 1800 ÷ 90 × 30 or 1800 ÷ 3	M1dep	oe 140 ÷ 0.05 or 2800 or 110 ÷ 0.05 or 2200 or 20 ÷ 0.05 or 400 or 30 ÷ 0.05
	600	A1	SC1 for 150
	Additional Guidance		
	1800 is ¼, 7200 is the whole circle		M1
	1800 is ¼		M0

Q	Answer	Mark	Comments
20(a)	**Alternative method 1**		
	$4x - 10$	B1	
	$6x$ – their $4x$ = their $-10 - 4$ or $2x = -14$	M1	oe $\frac{\text{their } -10 - 4}{6 - \text{their } 4}$ or $\frac{-14}{2}$
	-7	A1ft	ft their $(4x - 10)$
	Alternative method 2		
	$3x + 2 = 2x - 5$	B1	
	their $3x - 2x = -5$ – their 2	M1	oe
	-7	A1ft	ft their $(3x + 2)$
	Additional Guidance		
	their $(4x - 10)$ must be two terms with one correct to award the method mark		
	their $(3x + 2)$ must be two terms with one correct to award the method mark		
	$6x + 4 = 4x - 5$, $2x = -9$, $x = -\frac{9}{2}$		B0M1A1ft
	$3x + 4 = 2x - 5$, $x = -9$		B0M1A1ft
	$6x + 4 = 22x - 25$ (2 incorrect terms), $29 = 16x$, $x = \frac{29}{16}$		B0M0A0

Q	Answer	Mark	Comments
20(b)	$2y - y^4$	B2	B1 each term Do not ignore fw for B2
	Additional Guidance		
	Do not accept $y2$		
	$2y + - y^4$		B1
	$2y - y^4 = y^3$		B1
	$2 \times y - y^4$		B1
	$y \times 2 - y \times y^3$		B0
	$y2 + - y^4$		B0

Q	Answer	Mark	Comments
21	**Alternative method 1**		
	$6.25^2 + 15^2$ or $39(.0625) + 225$ or $264(.0625)$	M1	5, 12, 13 seen
	$\sqrt{6.25^2 + 15^2}$ or $\sqrt{39(.0625) + 225}$ or $\sqrt{264(.0625)}$	M1dep	oe $\frac{13}{5} \times 6.25$ or $\frac{13}{12} \times 15$
	[16.2, 16.3]	A1	Allow 16 with working shown
	Alternative method 2		
	$\tan^{-1} \frac{6.25}{15}$ or 22.6… or $\tan^{-1} \frac{15}{6.25}$ or 67.38…	M1	
	$\frac{15}{\cos \text{ their } 22.6}$ or $\frac{15}{\sin \text{ their } 67.38}$ or $\frac{6.25}{\sin \text{ their } 22.6}$ or $\frac{6.25}{\cos \text{ their } 67.38}$	M1dep	
	[16.2, 16.3]	A1	Allow 16 with working shown

Q	Answer	Mark	Comments
22(a)	25(%) : 75(%) or $\frac{1}{4} : \frac{3}{4}$	M1	oe
	1 : 3	A1	SC1 3 : 1
22(b)	19.5 ÷ 3 or 26 ÷ 4 or 6.5	M1	oe 19.5 ÷ 75 × 25
	6.50	A1	Correct money notation
	Additional Guidance		
	Condone 6.50p on answer line provided £ sign is not crossed out		M1A1

Q	Answer	Mark	Comments
23 Alt 1	**Alternative method 1**		
	Mid values seen (continuous data)	M1	5, 15, 25, 35 and 45 Allow one error
	All products seen for their mid values 4 × 5 or 20 8 × 15 or 120 9 × 25 or 225 3 × 35 or 105 1 × 45 or 45 or 515	M1dep	Allow one calculation error
	their (20 + 120 + 225 + 105 + 45) ÷ 25 their 515 ÷ 25 or 20.6 or 21 or 22 × 25 or 550	M1dep	
	20.6 or 21 and no or 515 and 550 and no	A1	SC2 15.6 or 16 and no or 16.6 or 17 and no or 25.6 or 26 and yes or 390 or 400 or 415 or 425 and 550 and no or 640 or 650 and 550 and yes

Q	Answer	Mark	Comments
23 Alt 2	**Alternative method 2**		
	Mid values seen (discrete data)	M1	5.5, 15.5, 25.5, 35.5 and 45.5 Allow one error
	All products seen for their consistent mid points 4 × 5.5 or 22 8 × 15.5 or 124 9 × 25.5 or 229.5 3 × 35.5 or 106.5 1 × 45.5 or 45.5 or 527.5	M1dep	Allow one calculation error
	their (22 + 124 + 229.5 + 106.5 + 45.5) ÷ 25 their 527.5 ÷ 25 or 21.1 or 21 or 22 × 25 or 550	M1dep	
	21.1 or 21 and no or 527.5 and 550 and no	A1	SC2 15.6 or 16 and no or 16.6 or 17 and no or 25.6 or 26 and yes or 390 or 400 or 415 or 425 and 550 and no or 640 or 650 and 550 and yes
	Additional Guidance		
	Beware, sight of 5 is not necessarily the first mid value as there are 5 groups		
	Beware, the middle of the middle class is 25		

Q	Answer	Mark	Comments
24(a)	Substitutes and evaluates correctly to show that the answer is even	B1	eg $5^2 + 3^2 = 34$ or $3^2 + 5^2 = 34$ $25 + 9 = 34$ or $9 + 25 = 34$ $7^2 + 3^2 = 58$ or $3^2 + 7^2 = 58$ $49 + 9 = 58$ or $9 + 49 = 58$ $7^2 + 5^2 = 74$ or $5^2 + 7^2 = 74$ $49 + 25 = 74$ or $25 + 49 = 74$ Ignore fw
	Additional Guidance		
	One correct example required with or without incorrect examples eg $2^2 + 3^2 = 13$, $5^2 + 3^2 = 34$		B1
24(b)	Substitutes and evaluates correctly to show that the answer is odd	B1	eg $3^2 + 2^2 = 13$ or $2^2 + 3^2 = 13$ $9 + 4 = 13$ or $4 + 9 = 13$ $5^2 + 2^2 = 29$ or $2^2 + 5^2 = 29$ $25 + 4 = 29$ or $4 + 25 = 29$ $7^2 + 2^2 = 53$ or $2^2 + 7^2 = 53$ $49 + 4 = 53$ or $4 + 49 = 53$ Ignore fw
	Additional Guidance		
	One correct example required with or without incorrect examples eg $2^2 + 3^2 = 13$, $5^2 + 3^2 = 34$		B1

Q	Answer	Mark	Comments
25	12	B1	
	their 12 × 1000 or 12 000 or 1.25 × 60 (× 60) or 75 or 4500 or their 12 ÷ 1.25 or 9.6 or 1000 ÷ 1.25 or 800 or 1.25 ÷ 1000 or 0.001 25	M1	oe
	their 12 000 ÷ their 75 or their 12 000 ÷ 1.25 or their 12 ÷ their 0.001 25 or their 9.6 × 1000 or their 12 × their 800 or 9600 or their 800 ÷ 60 (÷ 60) or 13.3(…) or 0.2(…) or their 12 × 1000 and 1.25 × 60 (× 60) or their 12 × 1000 and their 75 (× 60) or their 12 000 and their 4500	M1dep	oe
	160 or 2.66(…) or 2.67	A1	oe
	2 hours 40 minutes	A1	
	Additional Guidance		
	160 or 2.66(…) or 2.67 implies 4 marks		B1M1M1A1A0
	2 hours 66 minutes implies 2.66		B1M1M1A1A0
	their 12 is their volume		