

GCSE

# Mathematics (linear)

4365/2F

Mark scheme

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4365

November 2014

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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.

## Paper 2 Foundation Tier

Q	Answer	Mark	Comments
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1(a)	6	B1	
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1(b)	Subtract 5	B1	oe Accept $-5n + 36$
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Q	Additional Guidance	Mark
1(b)	number – 5	B1
	$n - 5$	B1
	Going down in 5s	B1
	Take 5	B1
1(b)	The first number – 5	B0
	$n = -5$	B0
	$-5n$	B0

1(c)	-4	B1	
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Q	Additional Guidance	Mark
1(c)	negative 4	B1
	minus 4	B1

1(d)	True	B3	B1 each
	False		
	False		

Q	Answer	Mark	Comments
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2(a)	(£) 3.74	B1	
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Q	Additional Guidance	Mark
2(a)	£3.74p 3.74p 374p with £ sign crossed out  374p without £ sign crossed out	B1 B1 B1  B0

2(b)	1.99 + 1.7 + 0.55 or 4.24	M1	oe Allow one error
	5 – their 4.24 or 0.76	M1dep	oe
	76	A1	£0.76

Q	Additional Guidance	Mark
2(b)	Allow a mixture of units for the M marks  76p seen in working, 0.76 on answer line	M1M1A1

3(a)	(3, 5)	B1	
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3(b)	(1, 3), (3, 3) and (5, 3)	B3	In any order B1 for each
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Q	Answer	Mark	Comments
4	Fully correct bar chart with equal gaps	B4	Bar drawn at height of 10 for bus Bar drawn at height of 7 for car Bars drawn at 2 for Train and 1 for Walk (train = twice walk is the condition) Total = 20  B3 for correct bar chart but no or unequal gaps or for 3 conditions met  B2 for 2 conditions met  B1 for 1 condition met

Q	Additional Guidance	Mark
4	Fully correct bar chart has equal width bars, equal width gaps and four correct heights  Accept if students relabel their scale, otherwise follow the mark scheme  The four conditions are: 1. Height 10 for bus 2. Height 7 for car 3. Train height twice as high as walk height 4. Total 20	

5(a)	Shades 12 squares	B1	
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Q	Additional Guidance	Mark
5(a)	Mark intention, positive marking	

Q	Answer	Mark	Comments
5(b)	Identifies $\frac{2}{5}$ and $\frac{8}{20}$	B2	B1 for one correct or one correct and one incorrect or two correct and one incorrect

6(a)	84	B1	
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6(b)	2 × 37 or 74 or 5 × 37 or 185 or 10 × 37 or 74 × 5	M1	oe
	370	A1	SC1 for 518

Q	Additional Guidance	Mark
6(b)	370 seen in working, 518 on answer line – choice  37 × 3 = 111, 111 × 5 = 555	SC1  M0A0

7(a)	25.11	B1	
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7(b)	23585	B1	
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7(c)	15.0665(...)	B1	
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Q	Additional Guidance	Mark
7(c)	Ignore any digits after the 4 <sup>th</sup> decimal place	

7(d)	15.1	B1ft	ft correct rounding to 1 dp
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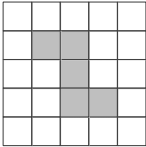
Q	Additional Guidance	Mark
7(d)	7c must have at least 2 decimal places Answer to part d is follow through or correct answer (may be a restart)	

Q	Answer	Mark	Comments
8(a)	Valid reason	Q1	Strand (ii) eg $14 \div 4$ is not a whole number 14 is not a multiple of 4 Because you need half centimetres Half the perimeter has to be even $14 \div 4 = 3.5$ $4 \times 3 = 12$ and $4 \times 4 = 16$

Q	Additional Guidance	Mark
8(a)	Because it wouldn't have the sides as a whole number 14 doesn't divide into a whole number Not possible because all the sides must be equal Nothing divides into 14 4 times (not true) Not possible to make 14 using the same number 4 times $14 \div 4$ without an answer or correct comment The grid is not big enough The square would not have equal sides	Q1  Q0 Q0 Q0 Q0 Q0 Q0 Q0

8(b)	Valid reason	Q1	Strand (ii) eg 12 is not a square number $\sqrt{12}$ is not a whole number $3 \times 3 = 9$ and $4 \times 4 = 16$ $\sqrt{12} = 3.4\dots$ or 3.5
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Q	Additional Guidance	Mark
8(b)	No number multiplied by itself equals 12 No whole number multiplied by itself equals 12 If it was a square it would have to be an area of 16 (not true) The length and width would not match each other It wouldn't have equal sides The base can't be timesed by the height to give 12 because the sides need to be equal Because 12 as an area would mean sides would be different lengths which would make the shape a rectangle not a square	Q1 Q1  Q0 Q0 Q0 Q0 Q0

Q	Answer	Mark	Comments
8(c)	<p>Correct shape drawn</p>  <p>Shape shown may be reflected or rotated</p>	B2	<p>B1 for a Pentomino with no lines of symmetry and no rotational symmetry</p> <p>B1 for any polyomino with no lines of symmetry and rotational symmetry of order 2</p>

Q	Additional Guidance	Mark
8(c)	<p><b>CANDIDATES MUST USE A DIFFERENT SHAPE TO THOSE GIVEN TO SCORE ANY MARKS</b></p> <p>Accept any rotation or reflection of shape shown in mark scheme</p> <p>If candidates do more than one, mark all and award the lowest mark</p>	

Q	Answer	Mark	Comments
*9	<b>Alternative Method 1</b> Packs of 6 / Packs of 2		
	1.38 × 3	M1	oe 4.17 ÷ 3
	4.14	A1	oe 1.39
	2 pack identified	Q1ft	Strand (iii) ft their values provided method mark has been awarded
	<b>Alternative Method 2</b> Scaling (multiples of 6)		
	1.38 × 6 and 4.17 × 2	M1	oe
	8.28 and 8.34	A1	oe
	2 pack identified	Q1ft	Strand (iii) ft their values provided method mark has been awarded
	<b>Alternative Method 3</b> Price per roll		
	1.38 ÷ 2 and 4.17 ÷ 6	M1	oe
	0.69 and 0.695	A1	oe Accept 0.69 and 0.7(0)
	2 pack identified	Q1ft	Strand (iii) ft their values provided method mark has been awarded
	<b>Alternative Method 4</b> Rolls per £		
	2 ÷ 1.38 and 6 ÷ 4.17	M1	
	1.44... and 1.43...	A1	
	2 pack identified	Q1ft	Strand (iii) ft their values provided method mark has been awarded

Q	Answer	Mark	Comments
9 cont.	<b>Alternative Method 5</b> Comparing proportions		
	$4.17 \div 1.38$ and $6 \div 2$	M1	$1.38 \div 4.17$ and $2 \div 6$
	3.02 and 3	A1	0.330... or 0.331 and 0.333...
	2 pack identified	Q1ft	Strand (iii) ft their values provided method mark has been awarded

Q	Additional Guidance	Mark
9	<p>Ignore any units throughout, e.g. 0.69p and 0.695p</p> <p>Students can scale up to any multiple of 6, e.g. 12, 18, 24, etc.</p> <p>Scale up to 18:  <math>1.38 \times 9</math> and <math>4.17 \times 3</math>                      12.42 and 12.51                      2 pack identified</p> <p>Scale up to 24:  <math>1.38 \times 12</math> and <math>4.17 \times 4</math>                      16.56 and 16.68                      2 pack identified</p> <p>Alternative method 6:  <math>1.38 \times 2 = 2.76</math> and <math>4.17 - 2.76</math>                      1.41                      2 pack identified</p> <p>The Q mark can be awarded if the candidate has scored M1 and has made a correct comparison from their two values</p> <p><b>Pack of 2 identified with no correct working scores no marks</b></p>	<p>M1 A1 Q1</p> <p>M1 A1 Q1</p> <p>M1 A1 Q1</p>

Q	Answer	Mark	Comments
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10	<b>Alternative Method 1</b>		
	100 – 60 or 40 or 40% seen	M1	$\frac{60}{100} \times 850$ or 510
	$\frac{\text{their } 40}{100} \times 850$ or 340	M1dep	850 – their 510 or 340
	$\frac{1700}{\text{their } 340}$	M1dep	
	5	A1	
	<b>Alternative Method 2</b>		
	100 – 60 or 40 or 40% seen	M1	1 – 0.6 or 0.4
	(1700 =) 200%	M1	1700 ÷ 850 or 2
	200 ÷ 40	M1dep	their 2 ÷ 0.4
	5	A1	

Q	Additional Guidance	Mark
10	5 with no working scores full marks	

Q	Answer	Mark	Comments						
11	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;">Emily</td> <td style="width: 33%;">Ben</td> <td style="width: 33%;">Cath</td> </tr> <tr> <td>Adam</td> <td>Darren</td> <td></td> </tr> </table>	Emily	Ben	Cath	Adam	Darren		B3	B2 for 2 conditions met B1 for 1 condition met
Emily	Ben	Cath							
Adam	Darren								

Q	Additional Guidance	Mark						
11	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;">Emily</td> <td style="width: 33%;">Ben</td> </tr> <tr> <td></td> <td>Adam</td> <td>Darren</td> </tr> </table> <p>Ben is North-East of Adam                      Darren is South-East of Emily</p> <p>Answer plan takes precedence over the plan at the top of the page, but this plan can be marked if the answer plan is blank</p> <p>Name in each box takes precedence over names written above or below unless clearly crossed out</p> <p>Allow abbreviated names</p> <p>If a name appears twice then conditions involving that person can't be met</p>		Emily	Ben		Adam	Darren	B2
	Emily	Ben						
	Adam	Darren						

12	A C A D B C B D C D	B2	Condone AB repeated  B1 for 3 or 4 correct
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Q	Additional Guidance	Mark
12	AC can be written as CA, etc.  Once a student starts to repeat any combination the maximum mark is B1 for 3 or 4 correct	

Q	Answer	Mark	Comments
13	5, 5 and 14 Any order	B2	Conditions are three positive numbers mode 5 median 5 range 9  B1 for 2 or 3 conditions satisfied

Q	Additional Guidance	Mark
13	There are four condition to meet: 1. All three numbers must be positive 2. The mode must be 5 3. The median must be 5 4. The range must be 9  5, 5, – 4 (satisfies three conditions but not positive) 5, 5, blank (satisfies two conditions)  Candidates who put more than 3 numbers score B0 Candidates who put 1 number score B0	B1 B1

14(a)	2700 ÷ 180 or 15 seen	M1	oe
	Beams = 30 or Posts = 16	A1	
	Beams = 30 and Posts = 16	A1ft	ft their 15 only if M1A0 SC1 for Beams = 16 and Posts = 30

Q	Additional Guidance	Mark
14(a)	ft only from M1A0: ft their 15 + 1 for number of posts ft their 15 × 2 for number of beams	

Q	Answer	Mark	Comments
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14(b)	5 × 40 or 200 or 9 × 21 or 189	M1	
	389	A1	SC1 for 465

Q	Additional Guidance	Mark
14(b)	465 (mixed up the beams and the posts)	SC1

15	70 × 5 or 350	M1	
	their 350 – (65 + 80 + 76 + 69)	M1dep	their 350 – 290
	60	A1	

Q	Additional Guidance	Mark
15	Embedded answer of 60 is 2 marks	

16	2 or 3 correct plots	M1	± ½ square tolerance
	Fully correct straight ruled line from (–3, –3) to (3, 9)	A1	± ½ square tolerance

Q	Additional Guidance	Mark
16	2 or 3 correct points from (–3, –3) (–2, –1) (–1, 1) (0, 3) (1, 5) (2, 7) (3, 9) for the first M1  Ignore additional points	

17	Fully correct enlargement	B2	B1 for 2 or 3 correct sides B1 for fully correct enlargement using SF 2 or 4
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Q	Answer	Mark	Comments
<b>18</b>	<b>Alternative Method 1</b>		
	5 miles = 8 km seen or implied	B1	oe
	$95 \times \text{their } \frac{5}{8}$	M1	$60 \times \text{their } \frac{8}{5}$
	59.(...) and yes	A1	96 and yes
	<b>Alternative Method 2</b>		
	95 × 5 or 475 or 95 ÷ 8 or 11.875	B1	60 × 8 or 480 or 60 ÷ 5 or 12
	95 × 5 ÷ 8	M1	60 × 8 ÷ 5
	59.(...) and yes	A1	96 and yes
	<b>Alternative Method 3</b>		
	95 × 5 or 475 or 60 × 8 or 480	B1	95 ÷ 8 or 11.875 or 60 ÷ 5 or 12
	95 × 5 or 475 and 60 × 8 or 480	M1	95 ÷ 8 or 11.875 and 60 ÷ 5 or 12
	475 and 480 and yes	A1	11.875 and 12 and yes
	<b>Alternative Method 4</b>		
	95 ÷ 60 or 1.5... or 8 ÷ 5 or 1.6	B1	60 ÷ 95 or 0.63... or 5 ÷ 8 or 0.62(5)
	95 ÷ 60 or 1.5... and 8 ÷ 5 or 1.6	M1	60 ÷ 95 or 0.63... and 5 ÷ 8 or 0.62(5)
	1.5... and 1.6 and yes	A1	0.63... and 0.625 and yes

Q	Answer	Mark	Comments
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Q	Additional Guidance	Mark
18	On alternative method 2 or 3, 11.875 can be 11.8(...) or 11.9  Throughout all methods students can use 2.5 and 4 in place of 5 and 8 for the first B1 (or 1.25 and 2, 10 and 16, etc – might be on the scale)	

19	0.6 × 2.4 or 1.44	M1	oe
	3.12 – their 1.44 or 1.68	M1dep	oe
	3.36	A1	

Q	Additional Guidance	Mark
19	Beware of incorrect methods, e.g. £3.12 – £2.40 = 72p, 72p × 2 = £1.44 scores M0	

20	11 × 3 or 33 or 10 + 10 + 14(.14) or 34 or 12 + 8 + 9 or 29	M1	Accept 3 <sup>rd</sup> side > 10
	33 and 34(.14) and 29 or 33 and > 30 and 29	A1	oe Accept 3 <sup>rd</sup> side > 10 or perimeter > 30
	$\frac{1}{3}$ or 0.33...	A1ft	oe ft their 33, 34 and 29

Q	Additional Guidance	Mark
20	<p>Do not accept 1 in 3, 1 out of 3, unlikely, etc.</p> <p>Accept <math>\frac{1}{3}</math> plus words unless contradictory, e.g. <math>\frac{1}{3}</math>, unlikely is ok</p> <p><math>\frac{1}{3}</math> with no working scores no marks</p> <p>Accept an accurate scale drawing of the middle triangle showing that the hypotenuse is greater than 10</p>	

21	$\frac{10}{100} \times 65.5$ or 6.55	M1	oe 0.9 or 90% seen
	58.95	A1	

Q	Answer	Mark	Comments
22	$9 \times 9$ or 81 or $9 \times 3$ or 27 or $\frac{1}{2} \times 9 \times 6$ or 27 or $\frac{1}{2} \times \frac{9}{2} \times 6$ or 13.5 or $\frac{1}{2} \times (3 + 9) \times \frac{9}{2}$ or 27	M1	
	$9 \times 3 + \frac{1}{2} \times 9 \times 6$ or $27 + 27$ or $9 \times 9 - 2 \times \frac{1}{2} \times \frac{9}{2} \times 6$ or $81 - 27$ or $2 \times \frac{1}{2} \times (3 + 9) \times \frac{9}{2}$ or $2 \times 27$	M1dep	
	54	A1	

Q	Additional Guidance	Mark
22	Beware of 27 from wrong working, e.g. $9 + 3 + 3 + 6 + 6$ $9 \times 3 = 27$ , $9 \times 6 = 54$ Just $9 \times 6 = 54$ The second M1 is for a fully correct method A fully correct method with further working loses the second M1	M1M0A0 M0M0A0

23(a)	0.3 or $\frac{3}{10}$ or 30%	B1	oe
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23(b)	0.11 or $\frac{11}{100}$ or 11%	B1	oe
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Q	Answer	Mark	Comments
23(c)	$200 \times 0.15$ or $\frac{30}{200}$	M1	oe
	30	A1	

Q	Additional Guidance	Mark
23(c)	<p><math>\frac{30}{200}</math> (do not allow any other fractions)</p> <p>e.g. <math>\frac{3}{20}</math> scores M0</p> <p>No misreads allowed</p>	M1A0

24(a)	Appropriate key	B1	
	Stem 1, 2, 3, 4	B1	
	Leaves correct and ordered 1 3 1 4 5 8 9 0 3 5 9 1 4 7 8	B1	
	Appropriate alignment of leaves	Q1ft	ft their single digit leaves Strand (ii) Consistent gaps so that row length represents the number of data it contains

Q	Answer	Mark	Comments
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Q	Additional Guidance	Mark
24(a)	<p>To award Q1ft there must be at least 2 leaves in at least 3 rows</p> <p>Ignore commas between numbers</p> <p>Ignore 0 and/or 5 on the stem for the stem mark</p> <p>Ignore 0 and/or 5 on the stem unless there are leaves for the third B mark</p> <p>If stem is 4, 3, 2, 1 then the order can be increasing or decreasing, if the stem is 1, 2, 3, 4 then the order should be increasing</p> <p>Key can be 0 / 4 to represent 4 people but not ... / 4 for example</p> <p>2 digit leaves cannot score the third B1 or the Q mark</p>	

24(b)	32	B1	
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25	<b>Alternative Method 1</b>		
	$D = 260$	B1	May be on diagram
	$A = 30$	B1	May be on diagram
	$360 - (30 + \text{their } 260 + \text{their } 30)$	M1	oe
	40	A1ft	ft their 260 and 30
	<b>Alternative Method 2</b>		
	$S = 50$ (and $R = 150$ )	B2	B1 for $R = 150$ May be on diagram
	$180 - (90 + \text{their } 50)$	M1	oe
	40	A1ft	ft their 150 and 50

Q	Answer	Mark	Comments
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Q	Additional Guidance	Mark
25	<p><b>MARK THE BEST EFFORT</b></p> <p>Beware of 30, this must be linked to angle A unless clear method shown, e.g. <math>90 - 60 = 30</math> is clearly angle A</p> <p>Answer 40 from no working is zero marks</p> <p>No ft from R to S</p> <p>Beware of an incorrect method for finding S, e.g. <math>R = 160</math> and <math>S = 50</math> scores B0</p>	

26(a)	$3a + 5b + 3a + 5b$	M1	oe
	$6a + 10b$ or $2(3a + 5b)$	A1	oe do not ignore fw for final mark

Q	Additional Guidance	Mark
26(a)	<p><math>3a + 5b \times 2 = 6a + 10b</math> (recovered)</p> <p><math>3a + 5b \times 2</math></p> <p><math>(3a + 5b)2</math></p> <p><math>6a10b</math></p> <p><math>3a \times 2 + 5b \times 2</math></p> <p><math>3a \times 2 5b \times 2</math></p>	<p>M1A1</p> <p>M1A0</p> <p>M1A0</p> <p>M1A0</p> <p>M1A0</p> <p>M0A0</p>

Q	Answer	Mark	Comments
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26(b)	$15ab$	B2	B1 for $3a \times 5b$ B1 for partially simplified answer B1 for $15 \times ab$
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Q	Additional Guidance	Mark
26(b)	Penalise further working, e.g. $3a \times 5b = 15ab = 3(5ab)$ gets B1  $15ba$ $A = 15ab$ $A(15ab)$ $15ab \text{ cm}^2$  $A(3a \times 5b)$ $(3a)(5b)$ $3a5b$ $15(ab)$ $3(5ab)$ $ab15$  $(15ab)^2$ $15ab^2$ $(3a \times 5b)^2$ $3a \times 5b^2$	B2 B2 B2 B2  B1 B1 B1 B1 B1 B1  B0 B0 B0 B0

26(c)	$315 \div 15$ or 21 seen	M1	
	7 and 3 in any order	A1	SC1 for 15 and 21 or 9 and 35

Q	Additional Guidance	Mark
26(c)	1 and 21 on the answer line	M1A0

Q	Answer	Mark	Comments
27	$\frac{4860}{5+4+3}$ or 405 or $\frac{5}{12}$ or $\frac{4}{12}$ or $\frac{3}{12}$	M1	
	2025 or 1620 or 1215	A1	
	2025 and 1620 and 1215	A1	Must be in correct order

Q	Additional Guidance	Mark
27	<b>ANSWERS MUST BE IN THE CORRECT ORDER</b>  <b>BEWARE:</b> 4860/5 = 972, 4860/4 = 1215, 4860/3 = 1620 which gives two correct answers in the wrong order, so answers must be from correct working (972 flags up an incorrect method)	M0A0A0

28(a)	$5x < 6 + 2$ or $5x < 8$	M1	$\frac{8}{5}$ or 1.6 seen oe
	$x < \frac{8}{5}$	A1	oe

Q	Additional Guidance	Mark
28(a)	Sight of 1.6 or $\frac{8}{5}$ score M1	

28(b)	2, 3, 4, 5, 6	B2	B1 for one extra or one missing eg 2, 3, 4, 5 1, 2, 3, 4, 5, 6 2, 3, 4, 5, 6, 7 2, 3, 5, 6
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Q	Answer	Mark	Comments
29(a)	$\pi \times 15^2$ or [706, 707]	M1	oe
	$\pi \times 15^2 \times 50$ or [706, 707] $\times 50$	M1dep	oe Accept [35 300, 35325)
	[35 325, 35 350]	A1	11 250 $\pi$

Q	Additional Guidance	Mark
29(a)	<p>Sight of <math>\pi \times 15^2</math> anywhere in the working is at least M1, e.g. <math>2 \times \pi \times 15 \times 15 = 1413.7</math> scores 1 mark</p> <p>If a student gives the answer <math>11250\pi</math> and then works this out then they must work it out correctly for the final A mark, e.g. <math>11250\pi = 35342.9</math> scores full marks but <math>11250\pi = 33750</math> scores two marks</p>	M1M0A0

Q	Answer	Mark	Comments
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29(b)	<b>Alternative method 1</b>		
	33 000 ÷ 1000 or 33	M1	oe 0.22 × 1000 or 220
	their 33 ÷ 0.22 or 150	M1	oe 33 000 ÷ their 220
	their 150 ÷ 60	M1	oe
	2.5	A1	
	<b>Alternative method 2</b>		
	0.22 × 60 or 13.2	M1	0.22 × 60 or 13.2
	their 13.2 × 1000 or 13 200	M1	33 000 ÷ 1000 or 33
	33 000 ÷ 13 200	M1	33 ÷ 13.2
	2.5	A1	
	<b>Alternative method 3</b>		
	0.22 × 1000 or 220	M1	
	their 220 × 60 or 13 200	M1	
	33 000 ÷ 13 200	M1	
	2.5	A1	

Q	Additional Guidance	Mark
29(b)	The three M marks can be done in any order  Alternative method: 33 000 ÷ 0.22 or 150 000 150 000 ÷ 1000 or 150 150 ÷ 60 2.5  An initial step of 33000 × 0.22 or 7260 cannot score any marks	M1 M1 M1 A1  MOMOMO A0