Q	Answer	Mark	Comments
1(a)	3	B1	

Q	Answer	Mark	Comments
1(b)	43	B1	

Q	Answer	Mark	Comments
1(c)	32	B1	

Q	Answer	Mark	Comments
2(a)	4	B1	

Q	Answer	Mark	Comments
2(b)	2 4 4 8 10 11 12 15 or 2 4 4 8 10 or 15 12 11 10 8 or 8 and 10 or $18 \div 2$ or $\frac{8+1}{2}$ th or 4.5th value	M1	full list of numbers in either order allow one missing, extra or transcription error in an otherwise full list of numbers list of first or last five numbers in either order allow only a transcription error in a list of the first or last five numbers oe works out the position of the median in the list
	9	A1	
	Additional Guidance		
	Ordered list in the stem of the question can be assumed to be for part (b) unless contradicted by the working seen in the working space		
	Numbers in a list may be seen crossed out in an attempt to find the median		
	Answer 9 from any or no list		M1A1
	Puts list in order then finds the mean		M1A0
	States 4.5th and gives 11.5 (oe)		M1A0

Q	Answer	Mark	Comments
2(c)	13	B1	

Q	Answer	Mark	Comments
3(a)	D	B1	
	A and E	B1	either order

Q	Answer	Mark	Comments
3(b)	Colour spinner with all sections labelled red, blue or green with at least one of each and number spinner with all sections labelled 1, 2, 3 or 4 with at least one of each	B2	B1 one spinner with all sections labelled red, blue or green with at least one of each or one spinner with all sections labelled 1, 2, 3 or 4 with at least one of each
	Additional Guidance		
	Allow any unambiguous labelling eg R for Red		
	Allow any unambiguous splitting into sections eg unruled		
	Number spinner under Colour heading and/or Colour spinner under Number heading can score a maximum of B1		
	Sections do not have to be equal		
	Ignore any probabilities given on the spinners		

Q	Answer	Mark	Comments
4	9.5 × 100 or 950 or 20 ÷ 100 or 0.2 or 2 × 20 ÷ 100 or 0.4	M1	oe 930 implies 950 9.3 implies 0.2
	their 950 – 2 × 20 or their 950 – 40 or 910 or 9.5 – 2 × their 0.2 or 9.5 – their 0.4 or 9.1	M1dep	oe eg 950 – 20 – 20 oe eg 9.5 – their 0.2 – their 0.2
	910 cm or 9.1 m	A1	oe
	Additional Guidance		
	Up to M2 may be awarded for correct work, with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	9 m 10 cm on answer line		M1M1A1
	Units may be seen in working but must be seen with the correct value eg 910 on answer line with 910 cm seen in working		M1M1A1
	9.5 – 2 × 20 = 910 centimetres or 9.1 metres		M1M1A1
	9.5 – 2 × 20 = 910 or 9.1		M1M1A0
	Do not ignore further incorrect conversion after correct answer seen eg 910 cm = 91 m		M1M1A0

Q	Answer	Mark	Comments	
5(a)	15	B1	implied by 70 or 345	
	(3rd term =) 70	B1ft	ft (their 15 – 1) × 5	
	Additional Guidance			
	15 70 on answer line			B1B1
	15 and/or 70 seen but not final term eg Answer 345			B1B0
	Answer only 345			B1B0

Q	Answer	Mark	Comments	
5(b)	50 × 2 or 100	M1		
	80	A1	SC1 120 or 5 or 60	
	Additional Guidance			
	80, 50, … on answer line			M1A1
	80, 50, … in working with answer line blank			M1A1
	80, 50, … in working with 35 on answer line			M1A0
	80 + 20 ÷ 2 = 50 without answer 80 (embedded answer)			M1A0

Q	Answer	Mark	Comments
6(a)	7	B1	

Q	Answer	Mark	Comments
6(b)	15	B1	

Q	Answer	Mark	Comments
6(c)	20 + 3 or 23 or 10.58	M1	may be implied by a journey (lines or curves) ending at 10.58 on the graph
	Straight line from (10.35, 7) to (10.58, 0)	A1	$\pm\frac{1}{2}$ small square ignore any other working lines on the graph
	Additional Guidance		
	Fully correct graph		M1A1
	Accept unruled line if intention clear		

Q	Answer	Mark	Comments
7	25 × 10.2(0) or 255	M1	oe
	10 – 7 + 3 – 1 or 3 + 2 or 5 or (10 – 7) × 11.8(0) or 3 × 11.8(0) or 35.4(0) or (3 – 1) × 11.8(0) or 2 × 11.8(0) or 23.6(0)	M1	oe
	their 5 × 11.8(0) or their 35.4(0) + their 23.6(0) or 59	M1dep	oe dep on 2nd M their 35.4(0) and their 23.6(0) must both be from correct methods
	314(.00)	A1	SC2 325.8(0) or 337.6(0)
	Additional Guidance		
	314.0		M3A0

Q	Answer	Mark	Comments
8	**Alternative method 1**		
	60 + 70 + 85 or 215	M1	
	1000 ÷ 5 or 200 or 1000 ÷ 4 or 250	M1	oe eg $\frac{1}{5} \times 1000$
	200 and 215 and 250	A1	
	Alternative method 2		
	60 + 70 + 85 or 215 or 1 ÷ 5 or 0.2 or 1 ÷ 4 or 0.25	M1	oe do not accept $\frac{1}{5}$ or $\frac{1}{4}$
	their 215 ÷ 1000 or 0.215 or their 215 × 4 or 860 or their 215 × 5 or 1075	M1dep	oe eg $\frac{215}{1000}$ 0.86 implies 860 1.075 implies 1075
	0.215 and 0.2 and 0.25 or 860 and 1075 and 1000 or 0.86 and 1.075 and 1	A1	oe decimals, percentages or fractions with a common denominator

Mark scheme and Additional Guidance continue on the next page

8 cont	**Alternative method 3**		
	60 ÷ 1000 or 0.06 or 70 ÷ 1000 or 0.07 or 85 ÷ 1000 or 0.085 or 1 ÷ 5 or 0.2 or 1 ÷ 4 or 0.25	M1	oe do not accept $\frac{1}{5}$ or $\frac{1}{4}$
	their 0.06 + their 0.07 + their 0.085 or 0.215	M1dep	oe their 0.06 and their 0.07 and their 0.085 must all be from correct methods
	0.215 and 0.2 and 0.25	A1	oe decimals, percentages or fractions with a common denominator
	Additional Guidance		
	Up to M2 may be awarded for correct work, with no answer or incorrect answer, even if this is seen amongst multiple attempts		

Q	Answer	Mark	Comments
9	Sometimes true Sometimes true Never true	B3	B1 for each
	Additional Guidance		
	Allow any unambiguous indication eg if a cross is the only indication in a row, take that as the answer		
	A row with a tick and some crosses, mark the tick		
	A row with more than one tick is B0 for that row		

Q	Answer	Mark	Comments
10(a)	p^3	B1	
	Additional Guidance		
	Accept $1p^3$		

Q	Answer	Mark	Comments
10(b)	$2a + 11c$	B2	either order B1 $2a$ or $11c$
	Additional Guidance		
	Further incorrect work after a B2 response is B1 eg $2a + 11c = 13ac$		B1
	Further incorrect work after a B1 response is B1 eg $3a + 11c = 14ac$		B1
	$a2 + 11c$ or $2a + c11$		B1
	$a2$ or $c11$		B1

Q	Answer	Mark	Comments
11	360 ÷ 9 (= 40) and 40 × 7 = 280 or 360 ÷ 9 (= 40) and 40 × 2 (= 80) and 80 + 280 = 360 or 40 × 2 (= 80) and 40 × 7 (= 280) and 80 + 280 = 360 or 280 ÷ 7 (= 40) and 40 × 9 = 360 or 2 : 7 = 80 : 280 and 80 + 280 = 360 or 360 – 280 (= 80) and 80 : 280 = 2 : 7	B2	oe B1 360 ÷ 9 or 280 ÷ 7 or 40 oe or $\frac{2}{9}$ or $\frac{7}{9}$ or 360 – 280 or 80 oe

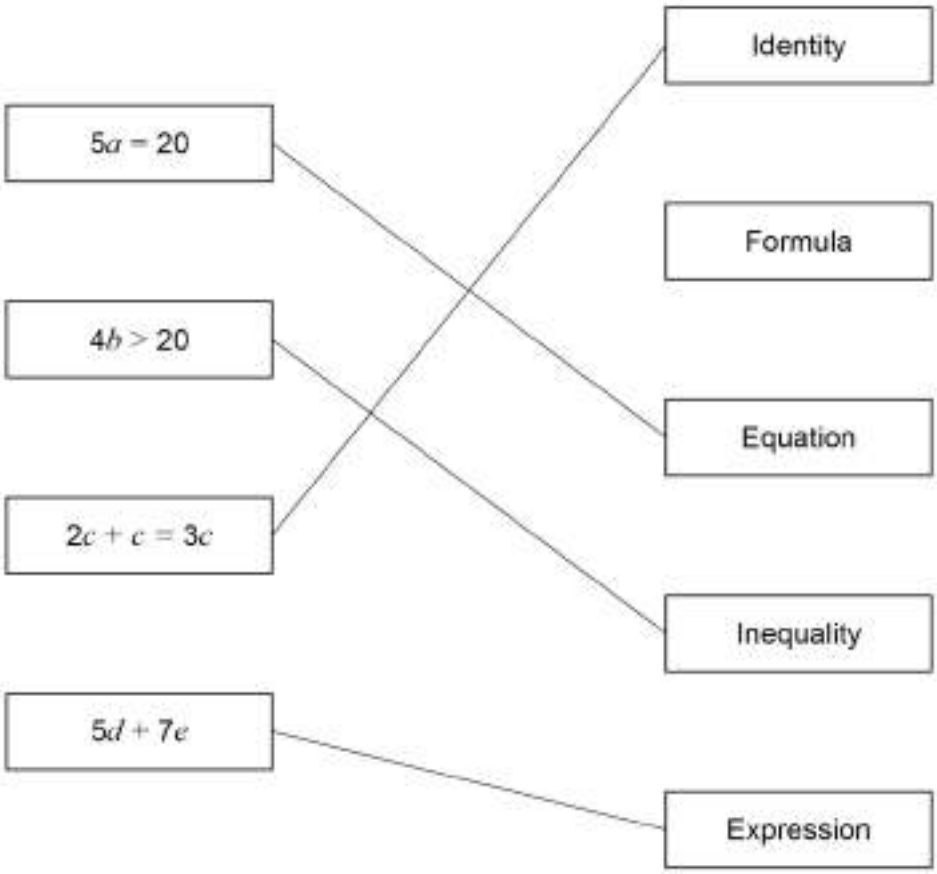
Additional Guidance

80 and 280 shown on the diagram is not oe for 80 + 280 = 360	
360 ÷ 9 × 7 = 280	B2
360 ÷ 9 and 40 × 2 and 2 : 7 = 80 : 280	B2
360 ÷ 9 = 40 and 2 : 7 = 80 : 280 (40 × 2 or 40 × 7 missing)	B1
40 × 7 = 280 without 360 ÷ 9 eg 40 × 7 = 280 and 80 + 280 = 360 (360 ÷ 9 = 40 or 40 × 2 missing)	B1
80 : 280 and 80 + 280 = 360 (2 : 7 = 80 : 280 missing)	B1
360 ÷ 9 = 40 and 80 + 280 = 360 (40 × 2 or 40 × 7 missing)	B1
280 ÷ 7 = 40 and 360 – 280 = 80 (40 × 2 or 40 × 9 missing)	B1
280 ÷ 7 and 40 × 2 and 80 : 280 = 2 : 7 (80 + 280 = 360 missing)	B1
80 + 280 = 360	B1

Q	Answer	Mark	Comments
12(a)	Pair of numbers satisfying all criteria	B2	B1 pair of numbers satisfying two criteria eg $c = 20$ $d = 14$ or $c = 7$ $d = 0$
	Additional Guidance		
	c and d can be decimals eg $c = 8.6$ $d = 2.6$		B2
	Correct integer values for B2 $c = 9$ $d = 3$ $c = 8$ $d = 2$ $c = 7$ $d = 1$ $c = 6$ $d = 0$ $c = 5$ $d = –1$		
	Examples of correct integer values for B1 $c = 10$ $d = 4$ $c = 4$ $d = –2$		

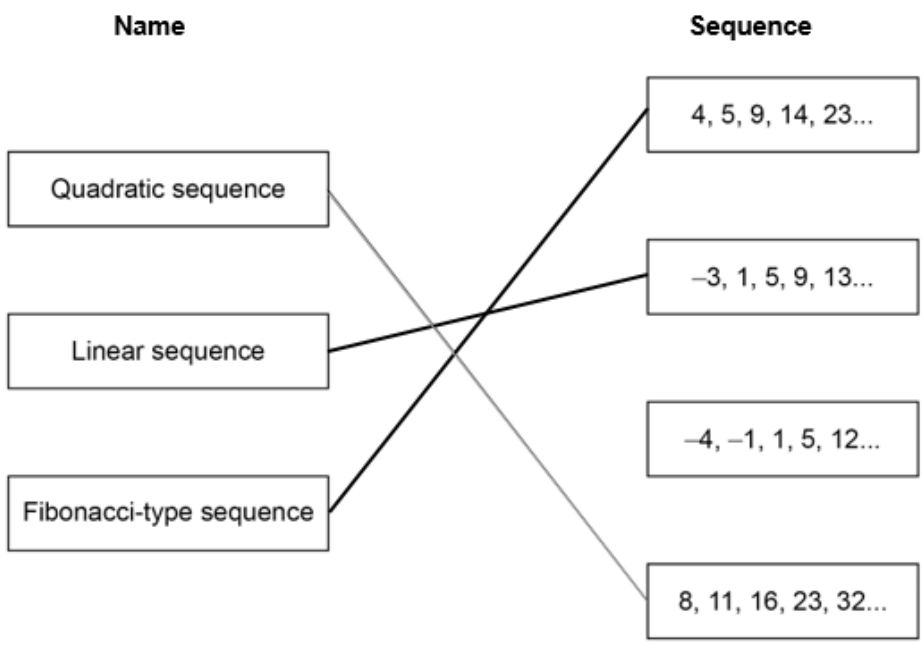
Q	Answer	Mark	Comments
12(b)	Pair of numbers satisfying all criteria	B2	eg $w = 1.9$ $x = 0.7$ B1 pair of numbers satisfying two criteria eg $w = 1.6$ $x = 1$ or $w = 2.4$ $x = 0.2$ or $w = 1.4$ $x = 0.9$ SC1 pair of numbers with a sum of 2.6 satisfying neither inequality
	Additional Guidance		
	$w = 0.7$ $x = 1.9$		SC1

Q	Answer	Mark	Comments
13	No ticked and appropriate working to show *AB* and *CD* are not parallel	B2	B1 any correct angle on the diagram eg 105 opposite the 105 given eg 85 written next to the 95 given or any correct angle which assumes lines are parallel eg 95 written opposite the 105 given or any correct angle evaluation seen in working eg 180 – 105 = 75
	Additional Guidance		
	Angles must be shown on diagram or clearly identified to score B2		
	Ignore any incorrect or irrelevant terminology alongside correct working		
	"No" may be implied		
	Condone an incorrect angle if not subsequently used		
	Crossed out angles on diagram may be used to support working		
	No and 95 should be 105		B2
	No and 95 written opposite the given 95 and 95 is not equal to 105		B2
	No and 105 opposite the given 105 and 85 next to the 95 and 105 + 85 = 190 (or should be 180)		B2
	No and 85 written next to the given 95 and 75 written next to the given 105 and 85 $\neq$ 75		B2
	No and 75 written alongside 105 and 75 written underneath 95 and 95 + 75 = 170 (or should be 180)		B2
	No and 95 written opposite 105 and the other two angles 75 and 95 + 75 + 75 + 105 = 350 (or should be 360)		B2
	95 + 105 = 200 is not a correct angle evaluation No and 95 + 105 = 200 and if it is 180 they will be parallel		B0

Q	Answer	Mark	Comments
14	All 3 correct matches	B3	B1 for each correct match
	Additional Guidance		
	Mark intention		
	Matching to more than one box on the right is choice for that match		
			B3

Q	Answer	Mark	Comments
15	496 ÷ 8 or 62	M1	oe eg 8 × 62
	5 × their 62 or 310	M1dep	oe 496 × $\frac{5}{8}$ is M2
	638 – their 310 or 328 or (638 – their 310) ÷ 2	M1dep	oe dep on M2
	164	A1	
	Additional Guidance		
	Up to M3 may be awarded for correct work, with no answer or incorrect answer, even if this is seen amongst multiple attempts		

Q	Answer	Mark	Comments
16	12 × 16 ÷ 2 or 96	M1	oe
	their 96 ÷ 7.5	M1dep	
	12.8	A1	SC1 25.6 or 6.4
	Additional Guidance		
	Up to M2 may be awarded for correct work, with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	12.8 × 7.5 = 96, 96 on answer line		M1M1A0

Q	Answer	Mark	Comments
17	2 correct matches	B2	B1 for 1 correct match
	Additional Guidance		
	Mark intention		
	Matching to more than one box on the right is choice for that match		
			B2

Q	Answer	Mark	Comments
18	1 – 0.04 or 0.96 or 0.04 × 1 000 000 or 40 000 or 960 000	M1	oe eg $1 - \frac{4}{100}$ 1 040 000 implies M1
	Full method for exactly 5 compounded percentage calculations with their multiplier	M1	oe eg 1 000 000 × their 0.96^5
	[800 000, 820 000] with M2 awarded	A1	
	Additional Guidance		
	815 372.(…) or 815 373 with M2 awarded		M1M1A1
	Answer 800 000 from 40 000 × 5		M1M0A0
	Answer 800 000 without either 40 000 shown or M2 awarded		M0M0A0
	Intermediate values for separate calculations are 960 000, 921 600, 884 736, 849 346.(…)		

Q	Answer	Mark	Comments
19	No ticked and correct reason or correct evaluation of the surface areas for any numerical or algebraic values or correct ratio of the surface areas	B2	eg 2 faces are hidden B1 No ticked
	Additional Guidance		
	Ignore irrelevant reasons or evaluations alongside a correct reason or evaluation, unless contradictory		
	"No" may be implied by a correct reason		
	Accept reasoning that uses A as a cube		
	No ticked and A has 6, B has 10 (condone sides for faces) A has 3, B has 5 A has 6 sides, on B each cube only has 5 Ratio is 3:5 (accept equivalent ratios) The bottom and the top are missing (or covered) When they are put together you lose two faces You wouldn't count two sides (condone sides for faces) Some of the faces are covered You cannot see one side because they are stacked together One face covered Part of the area of A is covered where it joins B Both touching sides		 B2 B2 B2 B2 B2 B2 B2 B2 B2 B2 B2 B2
	Yes ticked or Cannot tell ticked		B0

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="3">20(a)</td><td>0 and 3 in the correct positions</td><td>B2</td><td>B1 0 or 3 in the correct position</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2"><table>
<tr><td>x</td><td>–3</td><td>–2</td><td>–1</td><td>0</td><td>1</td></tr>
<tr><td>y</td><td>3</td><td>0</td><td>–1</td><td>0</td><td>3</td></tr>
</table></td><td>B2</td></tr>
</table>

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="6">20(b)</td><td>Plots at least three points correctly</td><td>M1</td><td>correct or ft their table in (a)
$\pm\frac{1}{2}$ small square
points may be implied by graph passing through them</td></tr>
<tr><td>Correct graph drawn through the five correct points</td><td>A1</td><td>$\pm\frac{1}{2}$ small square
smooth quadratic curve</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Correct graph drawn without plotting the correct points</td><td>M1A1</td></tr>
<tr><td colspan="2">Ignore any extra points plotted</td><td></td></tr>
<tr><td colspan="2">Ignore any part of graph drawn for $x < -3$ or $x > 1$</td><td></td></tr>
<tr><td colspan="2">Ruled straight lines</td><td>A0</td></tr>
</table>

Q	Answer	Mark	Comments
21	**Alternative method 1**		
	2450 ÷ (2 + 5) or 2450 ÷ 7 or 350	M1	oe
	their 350 × 5 or 1750 or their 350 × 2 or 700 or their 350 ÷ 4 or 87.5(0)	M1dep	oe 2450 × $\frac{5}{7}$ is M2 2450 × $\frac{2}{7}$ is M2 2450 ÷ 28 is M2
	their 1750 ÷ 4 or (2450 – their 700) ÷ 4 or their 87.5(0) × 5 or 437.5(0)	M1dep	oe dep on M2 350 × $\frac{5}{4}$ is M3
	437.5(0) and Yes	A1	accept 437.5(0) > 430
	Alternative method 2		
	2450 ÷ 4 or 612.5(0)	M1	oe
	their 612.5(0) ÷ (2 + 5) or their 612.5(0) ÷ 7 or 87.5(0)	M1dep	oe 2450 ÷ 28 is M2
	their 87.5(0) × 5 or their 612.5(0) – their 87.5(0) × 2 or 437.5(0)	M1dep	oe dep on M2 612.5(0) × $\frac{5}{7}$ is M3
	437.5(0) and Yes	A1	accept 437.5(0) > 430

Mark scheme and Additional Guidance continue on the next page

21 cont	**Alternative method 3**		
	430 × 4 or 1720	M1	
	2450 ÷ (2 + 5) or 2450 ÷ 7 or 350	M1	oe
	their 350 × 5 or 1750 or their 350 × 2 or 700	M1dep	oe dep on 2nd M 2450 × $\frac{5}{7}$ is M2 2450 × $\frac{2}{7}$ is M2
	1720 and 1750 and Yes	A1	2450 – 1720 = 730 and 700 and Yes
	Alternative method 4		
	430 × 4 or 1720	M1	
	their 1720 ÷ 5 or 344 or their 1720 × 2 or 3440	M1dep	oe
	their 344 × 2 or their 3440 ÷ 5 or 688	M1dep	oe dep on M2 1720 × $\frac{2}{5}$ is M3
	2408 and Yes	A1	
	Additional Guidance		
	Up to M3 may be awarded for correct work, with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	2450 ÷ 7 × 1.25 or 350 × 1.25		M1M1M1
	Yes may be implied eg They receive 7.50 more than 430		M3A1
	Condone £437.50p and Yes		M3A1

Q	Answer	Mark	Comments
22	80 – 25 or 55 or 360 – 80 – 25 or 255	M1	oe implied by 1 degree = 2.4 people or 5 degrees = 12 people
	$\frac{132}{\text{their } 55} \times 360$ or 864 or $\frac{132}{\text{their } 55} \times 80$ or 192 or $\frac{132}{\text{their } 55} \times 25$ or 60 or $\frac{132}{\text{their } 55} \times$ their 255 or $\frac{132}{\text{their } 55} \times (80 + 25)$ or 252 or their $255 \div \frac{\text{their } 55}{132}$	M1dep	oe 2.4 × their 255 is M2 12 × 51 is M2 2.4 × 105 is M2
	612	A1	
	Additional Guidance		
	Up to M2 may be awarded for correct work, with no answer or incorrect answer, even if this is seen amongst multiple attempts		

Q	Answer	Mark	Comments
23	**Alternative method 1 – using tangent of an angle**		
	tan chosen or used	M1	
	$\tan 58 = \frac{x}{46}$ or $46 \times \tan 58$ or $\tan 32 = \frac{46}{x}$ or $\frac{46}{\tan 32}$	M1dep	oe
	[73.6, 74]	A1	
	Alternative method 2 – finding hypotenuse first		
	$\frac{46}{\cos 58}$ or $\frac{46}{\sin 32}$ or 86.8(...) or 87	M1	oe
	$\sqrt{(\text{their } 86.8(...))^2 - 46^2}$ or $\sqrt{5418.(...)}$ or their 86.8(…) × sin 58 or their 86.8(…) × cos 32	M1dep	oe
	[73.6, 74]	A1	
	Additional Guidance		
	Do not accept scale drawing		
	Answer 73 after answer in range seen		M1M1A1
	$\frac{\sin 32}{46} = \frac{\sin 58}{x}$		M1

Q	Answer	Mark	Comments	
24(a)	8 or 10	M1	8 may be implied by 2^2 or 4	
	8 and 10 and $\frac{1}{40}$ or 0.025	A1	8 may be implied by 2^2 or 4 accept 0.03 with $\frac{1}{40}$ or 0.025 seen	
	Additional Guidance			
	Do not allow exact calculations for M1A1 eg 4.113 = 4 and 10.21 = 10 and $\frac{1}{40}$			M1A0
	$\frac{1}{40}$ or 0.025 with 8 or 10 seen (8 may be implied by 2^2 or 4)			M1A0
	$\frac{1}{40}$ or 0.025 without 8 or 10 seen (8 may be implied by 2^2 or 4)			M0A0

Q	Answer	Mark	Comments
24(b)	Valid explanation	B1	eg both numbers have been rounded down
	Additional Guidance		
	Ignore irrelevant reasons alongside a correct reason, unless contradictory		
	Ignore a calculation using exact values alongside a correct reason eg 0.025 is greater than 0.0238… and both numbers rounded down	B1	
	0.025 is greater than 0.0238…	B0	
	The denominator is smaller	B1	
	The denominator using the exact values is bigger	B1	
	(Decimals) rounded down	B1	
	Because 8.34 is more than 8 and 10.21 is more than 10	B1	
	One is divided by less (with answer more)	B1	
	Estimating rounds the numbers down which makes the denominator less	B1	
	Estimating rounds the numbers down which makes it less	B0	
	Because it rounds up	B0	
	Because she rounded each number to one significant figure	B0	
	The numbers get rounded up so more than the exact value	B0	
	Rounded up when estimating	B0	
	Removing the decimals makes the number bigger	B0	

Q	Answer	Mark	Comments
25(a)	$(x + 3)(x + 5)$	B2	either order B1 $(x + a)(x + b)$ where $ab = 15$ or $a + b = 8$
	Additional Guidance		
	Accept $1x$ for x throughout		
	$(3 + x) \times (x + 5)$		B2
	Condone missing final bracket eg $(5 + x)(3 + x$		B2
	Ignore any attempt to solve $(x + 3)(x + 5) = 0$ eg $(x + 3)(x + 5)$ followed by $x = 3$, $x = 5$		B2

Q	Answer	Mark	Comments
25(b)	$(y =) -2$ $(y =) 4$	B1	either order
	Additional Guidance		
	Accept any letter eg $x = -2$ $x = 4$		B1
	–2 and 4 on the answer line		B1
	–2 and 4 written separately in the stem unless contradicted by answer line		B1
	–2 and 4 written with $(-2 + 2)(4 - 4)$ unless contradicted by answer line		B1
	$(-2 + 2)(4 - 4)$ on answer line		B0
	$(-2 + 2)(4 - 4)$ even if –2 and 4 circled or indicated as the embedded values		B0