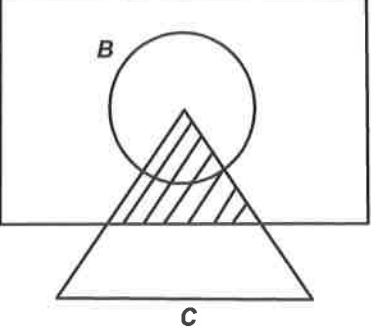
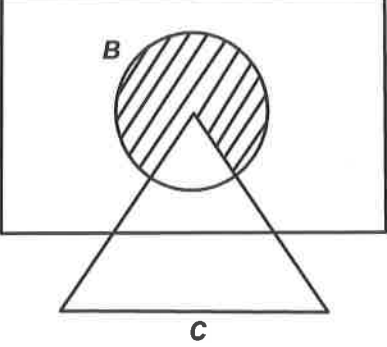
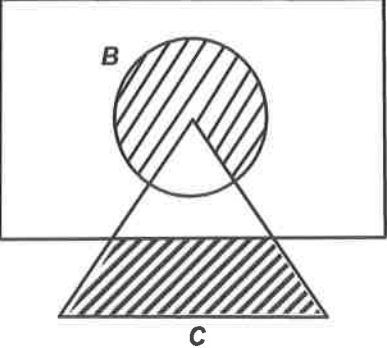


NO. OF QUESTIONS	MARKING SCHEME		MARKS	TOTAL MARKS
1	(a)	<p data-bbox="363 367 387 400">A</p> 	K1	1
	(b)	<p data-bbox="363 732 387 766">A</p>  <p data-bbox="347 1128 783 1162"><u>Note</u> : Correctly shaded, award K1</p> <p data-bbox="363 1247 387 1281">A</p> 	K2	2
				3

2	$(4x \times 4x) - \frac{1}{2} \times \frac{22}{7} \times \left(\frac{14}{2}\right)^2 = 101x$ $16x^2 - 101x - 77 = 0$ $(16x + 11)(x - 7) = 0$ <p>OR</p> $x = \frac{-(-101) \pm \sqrt{(-101)^2 - 4(16)(-77)}}{2(16)} \text{ or equivalent (K1)}$ $x = 7, \left[x = -\frac{11}{16} \right]$ <p><i>length = 28 cm</i></p> <p><u>Note:</u></p> <ol style="list-style-type: none"> 1. Accept without “= 0”. 2. Accept three terms on the same side, in any order. 3. Correct answer without showing method of solving quadratic equation ----- award 3 marks. 4. Value in $\left[\right]$ may be ignored. 	K1 K1 N1 N1	4
			4
3	$n = 3 - 3m \text{ or } m = \frac{3-n}{3} \text{ or } n = 3m - 9 \text{ or } m = \frac{9+n}{3} \text{ or equivalent}$ <p>OR</p> $3m + n = 3 \text{ or equivalent (K1)}$ $6m = 12 \text{ or } -2n = 6 \text{ or equivalent}$ <p>OR</p> $\begin{pmatrix} m \\ n \end{pmatrix} = \frac{1}{(1)(-1) - (3)\left(\frac{1}{3}\right)} \begin{pmatrix} -1 & -\frac{1}{3} \\ -3 & 1 \end{pmatrix} \begin{pmatrix} 1 \\ 9 \end{pmatrix} \text{ or equivalent (K2)}$ <p><u>Note:</u></p> <ol style="list-style-type: none"> 1. $\begin{pmatrix} -1 & -\frac{1}{3} \\ -3 & 1 \end{pmatrix} \begin{pmatrix} m \\ n \end{pmatrix} = \begin{pmatrix} 1 \\ 9 \end{pmatrix} \text{ or } \begin{pmatrix} m \\ n \end{pmatrix} = \begin{pmatrix} \text{inverse} \\ \text{matrix} \end{pmatrix} \begin{pmatrix} 1 \\ 9 \end{pmatrix} \text{ award K1}$ 	K1 K1	

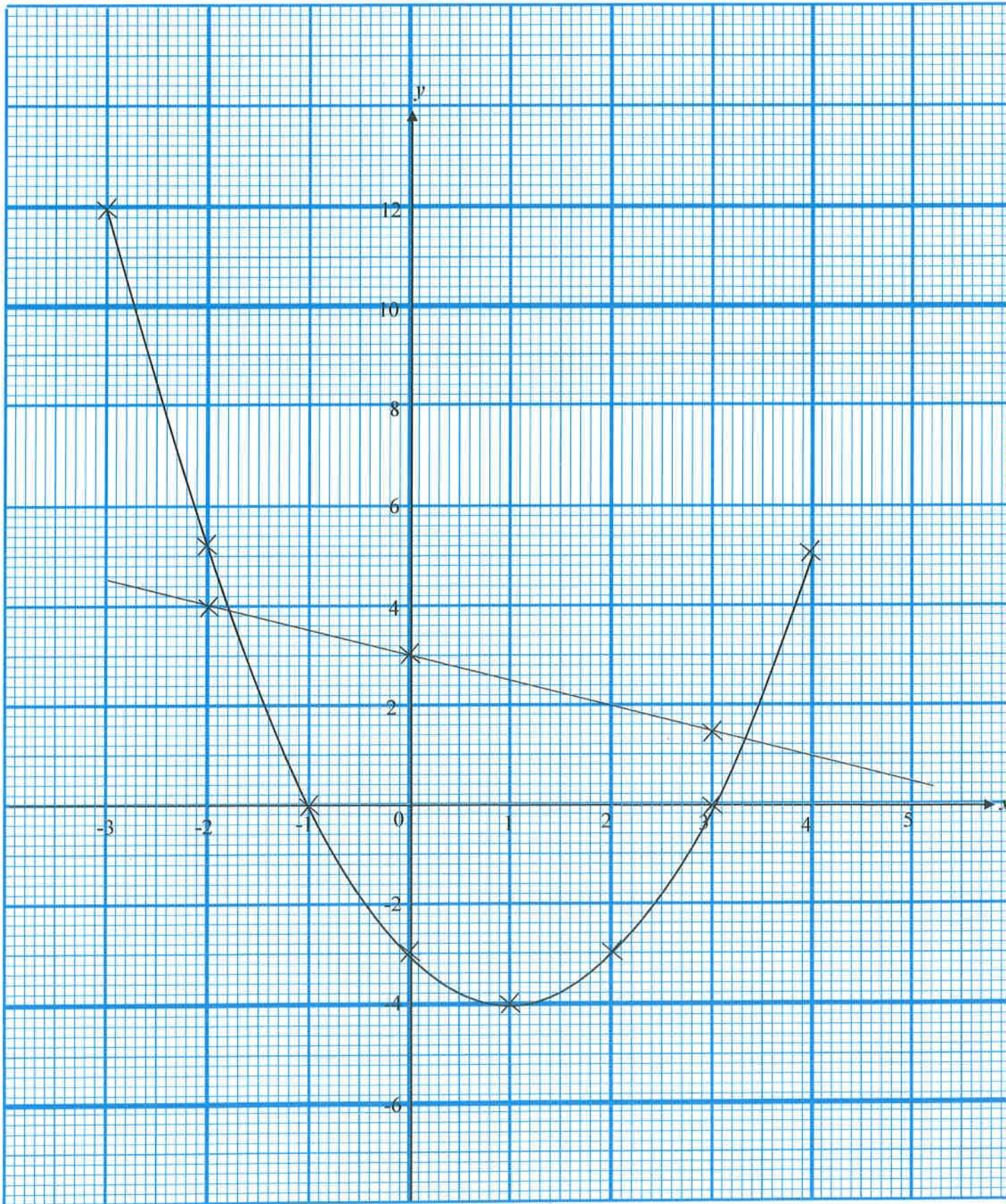
6	(a)	$2(6) = 3x + 6$ $(2, 6)$	K1 N1	2
	(b)	$m = \frac{3}{2}$ $6 = \left(\frac{3}{2}\right)(5) + c$ <u>or</u> $c = -\frac{3}{2}$ OR $\frac{y-6}{x-5} = \left(\frac{3}{2}\right)$ $y = \frac{3}{2}x - \frac{3}{2}$ <u>or</u> equivalent	P1	3
			K1 N1	
7	(a)	And	P1	1
	(b)	Implication 1: If W is a perfect square number then the square root of W is a whole number. Implication 2: If the square root of W is a whole number then W is a perfect square number.	K1	2
			K1	
(c)	$(3 \times n^2) - n, n = 1, 2, 3, \dots$ <u>Note:</u> $(3 \times n^2) - n$, award K1	K2	2	5

8	<p>(a) $(5)(-1) - (2)(p) = 0$ $p = -\frac{5}{2}$</p>	<p>K1 N1</p>	<p>2</p>
	<p>(b) $40 + 2x = 2(y + 23)$ or $2x - 2y = 6$ or $2x + y = 54$</p> $\begin{pmatrix} 2 & -2 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 6 \\ 54 \end{pmatrix}$ $\frac{1}{(2)(1) - (-2)(2)} \begin{pmatrix} 1 & 2 \\ -2 & 2 \end{pmatrix} \begin{pmatrix} 6 \\ 54 \end{pmatrix}$ <p>Ingredient B for chocolate cake, $y = 16$</p> <p><u>Note :</u></p> <ol style="list-style-type: none"> $\begin{pmatrix} \\ \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} \\ \end{pmatrix}$, award first K1. $\begin{pmatrix} \text{inverse} \\ \text{matkrix} \end{pmatrix} \begin{pmatrix} \\ \end{pmatrix}$, award second K1. Correct matrix method with incorrect equations award P0K1K1N0. Do not accept any solution solved not using matrix method. 	<p>P1 K1 K1 N1</p>	<p>4 6</p>

9	a)	$\frac{1}{2} \times 2 \times \frac{22}{7} \times 70 \text{ or } 2 \times 140 \text{ or equivalent}$ $2 \times \frac{1}{2} \times 2 \times \frac{22}{7} \times 70 + 2 \times 140$ <p>720</p>	K1	3															
	b)	<p>56 seen</p> $140 \times 112 \text{ or } \frac{1}{2} \times \frac{22}{7} \times (56)^2 \text{ or equivalent}$ $2 \times \frac{1}{2} \times \frac{22}{7} \times (56)^2 + 140 \times 112 \text{ or equivalent}$ <p>25536</p>	P1 K1 K1 N1		4 7														
10	(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Student</th> <th colspan="3">Probability</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>Jamal</td> <td>$\frac{2}{5}$</td> <td>$\frac{2}{5}$</td> <td>$\frac{1}{5}$</td> </tr> <tr> <td>Nazri</td> <td>$\frac{3}{5}$</td> <td>$\frac{2}{5}$</td> <td>0</td> </tr> </tbody> </table> <p>All 6 values correct</p> <p><u>Note:</u> 4 or 5 values correct, award N1.</p>	Student	Probability			A	B	C	Jamal	$\frac{2}{5}$	$\frac{2}{5}$	$\frac{1}{5}$	Nazri	$\frac{3}{5}$	$\frac{2}{5}$	0	N2	2
	Student	Probability																	
A		B	C																
Jamal	$\frac{2}{5}$	$\frac{2}{5}$	$\frac{1}{5}$																
Nazri	$\frac{3}{5}$	$\frac{2}{5}$	0																
(b)	<p>i) $\frac{2}{5} \times \frac{3}{5}$</p> <p>$\frac{6}{25}$</p>	K1 N1	2																

		ii) $1 - \left(\frac{2}{5} \times \frac{3}{5}\right) - \left(\frac{2}{5} \times \frac{2}{5}\right)$ <u>or</u> $\left(\frac{2}{5} \times \frac{2}{5}\right) + \left(\frac{2}{5} \times 0\right) + \left(\frac{2}{5} \times \frac{3}{5}\right) + \left(\frac{2}{5} \times 0\right) + \left(\frac{1}{5} \times \frac{3}{5}\right) + \left(\frac{1}{5} \times \frac{2}{5}\right)$ $\frac{15}{25}$ <u>or</u> $\frac{3}{5}$	K1	
			N1	2
				6
11	(a)	8	P1	1
	(b)	(i) $\frac{0 - 20}{24 - 20}$ -5	K1	2
		(ii) $\frac{\frac{1}{2}(5 + 20)(12) + (20 \times 8) + \frac{1}{2}(4)(20)}{24}$ <u>or</u> equivalent 14.58	K1	
			N1	
				5

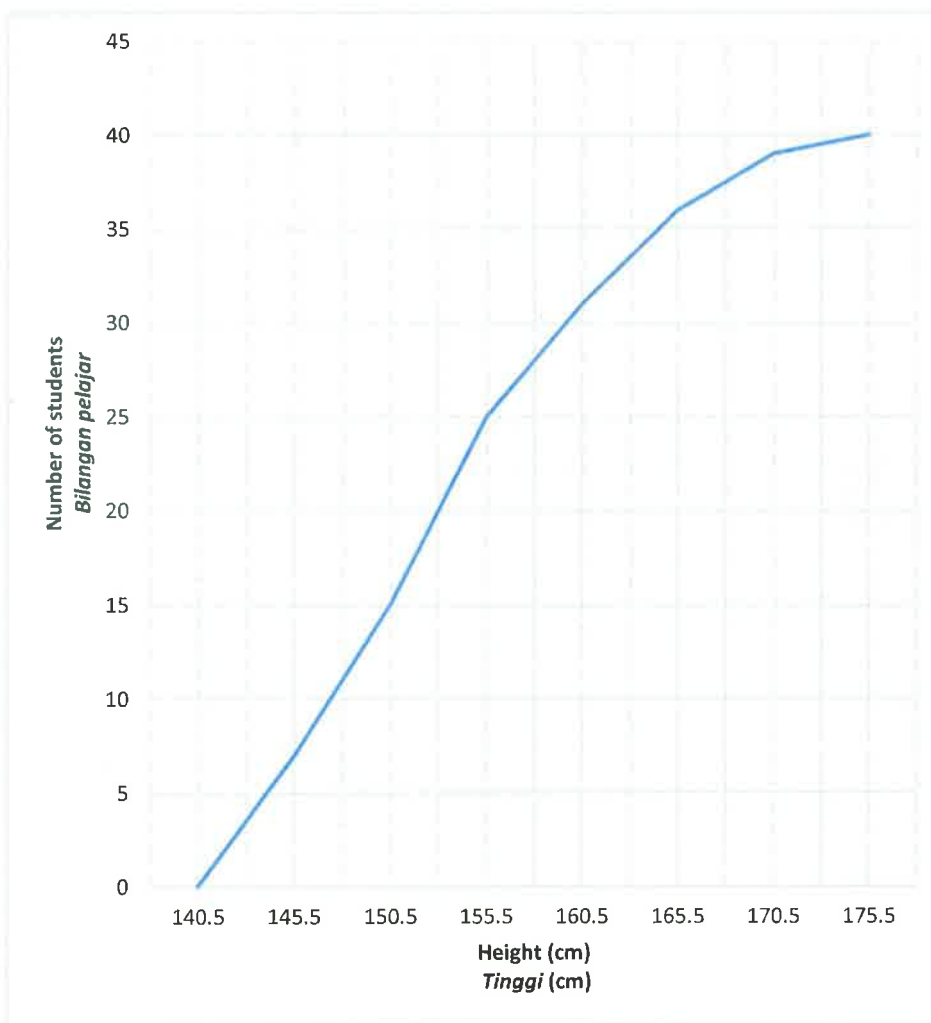
12	(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">x</td> <td style="text-align: center;">-2</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">y</td> <td style="text-align: center;">5</td> <td style="text-align: center;">-3</td> </tr> </table>	x	-2	2	y	5	-3	K1 K1	2
	x	-2	2							
	y	5	-3							
	(b)	<p>Graph (Refer to graph)</p> <p>The axes drawn in the right direction with uniform scale for $-3 \leq x \leq 4$ and $-4 \leq y \leq 12$.</p> <p>All 6 points and *2 points plotted correctly or the curve passes through the 8 points in the range of $-3 \leq x \leq 4$ and $-4 \leq y \leq 12$.</p> <p><u>Note :</u> If 6 or 7 points are plotted correctly, award K1</p> <p>Smooth and continuous curve that passes through all the points correctly without any straight segment in the range $-3 \leq x \leq 4$ and $-4 \leq y \leq 12$.</p>	P1 K2 N1	4						
(c)	<p>(i) $y = -1.8 \pm 0.1$</p> <p>(ii) $x = 3.65 \pm 0.05$</p>	P1 P1	2							
(d)	<p>Straight line $y = -\frac{1}{2}x + 3$ correctly drawn</p> <p><u>Note:</u> Identify equation $y = -\frac{1}{2}x + 3$, award K1</p> <p>$x = -1.80 \pm 0.05$</p> <p>$x = 3.30 \pm 0.05$</p>	K2 N1 N1	4							
				12						



13	(a)	(i) $(1, -10)$ <u>Note:</u> $(2, -6)$ seen, award P1	P2	4	
		(ii) $(-6, -6)$ <u>Note:</u> $(-5, -2)$ seen, award P1	P2		
	(b)	(i) (a) Reflection in line $x=1$ <u>Note:</u> Reflection only, award P1.	P2		5
		(b) Enlargement, scale factor $-\frac{1}{2}$, centre $(-1, -1)$ <u>Note:</u> 1. Enlargement, scale factor $-\frac{1}{2}$, <i>or</i> Enlargement, centre $(-1, -1)$, award P2. 2. Enlargement only, award P1.	P3		
		(ii) $12 = \left(-\frac{1}{2}\right)^2 \times A_0$ $A_0 = 48$ <u>Note:</u> $12 = \left(-\frac{1}{2}\right)^2 \times A_0$, award K1	K2		
			N1		12

14	(a)	<table border="1" data-bbox="351 324 1268 817"> <thead> <tr> <th></th> <th>Height (cm) Tinggi (cm)</th> <th>Upper Boundary <i>Sempadan Atas</i></th> <th>Frequency <i>Kekerapan</i></th> <th>Cumulative Frequency <i>Kekerapan Longgokan</i></th> </tr> </thead> <tbody> <tr> <td>I</td> <td>136-140</td> <td>140.5</td> <td>0</td> <td>0</td> </tr> <tr> <td>II</td> <td>141-145</td> <td>145.5</td> <td>7</td> <td>7</td> </tr> <tr> <td>III</td> <td>146-150</td> <td>150.5</td> <td>8</td> <td>15</td> </tr> <tr> <td>IV</td> <td>151-155</td> <td>155.5</td> <td>10</td> <td>25</td> </tr> <tr> <td>V</td> <td>156-160</td> <td>160.5</td> <td>6</td> <td>31</td> </tr> <tr> <td>VI</td> <td>161-165</td> <td>165.5</td> <td>5</td> <td>36</td> </tr> <tr> <td>VII</td> <td>166-170</td> <td>170.5</td> <td>3</td> <td>39</td> </tr> <tr> <td>VIII</td> <td>171-175</td> <td>175.5</td> <td>1</td> <td>40</td> </tr> </tbody> </table> <p data-bbox="351 862 774 1019"> Height : II to VIII Upper boundary : II to VIII Frequency : II to VIII Cumulative frequency : II to VIII </p>		Height (cm) Tinggi (cm)	Upper Boundary <i>Sempadan Atas</i>	Frequency <i>Kekerapan</i>	Cumulative Frequency <i>Kekerapan Longgokan</i>	I	136-140	140.5	0	0	II	141-145	145.5	7	7	III	146-150	150.5	8	15	IV	151-155	155.5	10	25	V	156-160	160.5	6	31	VI	161-165	165.5	5	36	VII	166-170	170.5	3	39	VIII	171-175	175.5	1	40	<p data-bbox="1332 862 1380 1019"> P1 P1 P1 P1 </p>	4
	Height (cm) Tinggi (cm)	Upper Boundary <i>Sempadan Atas</i>	Frequency <i>Kekerapan</i>	Cumulative Frequency <i>Kekerapan Longgokan</i>																																													
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VII	166-170	170.5	3	39																																													
VIII	171-175	175.5	1	40																																													
	(b)	$\frac{143(*7) + 148(*8) + 153(*10) + 158(*6) + 163(*5) + 168(*3) + 173(*1)}{*7 + *8 + *10 + *6 + *5 + *3 + *1}$ <p data-bbox="351 1254 422 1288">153.9</p> <p data-bbox="351 1321 1212 1400"> <u>Note :</u> Correct answer from incomplete working -----award maximum 2 marks </p> <p data-bbox="351 1422 582 1512"> e.g : $\frac{6155}{40} = 153.9$ </p>	<p data-bbox="1332 1153 1380 1187">K2</p> <p data-bbox="1332 1254 1380 1288">N1</p>	3																																													

(c) Refer graph



Axes drawn in correct direction, uniform scale for $140.5 \leq x \leq 175.5$ and $0 \leq y \leq 40$.

1 point and *7 points plotted correctly or curve passes through all the points for $140.5 \leq x \leq 175.5$ and $0 \leq y \leq 40$.

Note:

*6 or *7 points correctly plotted, award K1

Smooth and continuous curve and passes through all 8 points correctly using the given scales for $140.5 \leq x \leq 175.5$ and $0 \leq y \leq 40$.

P1

K2

N1

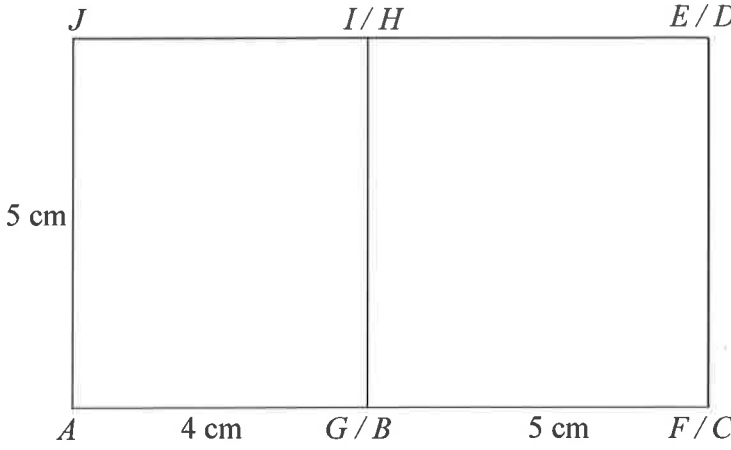
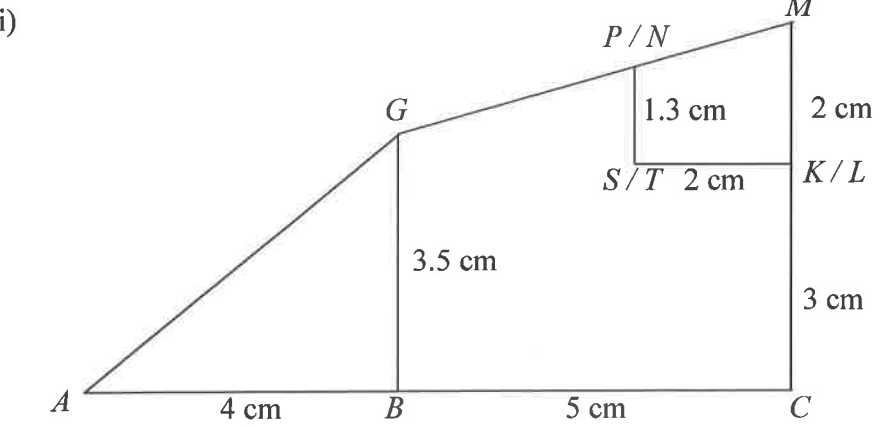
4

(d) Median = 153 ± 0.5

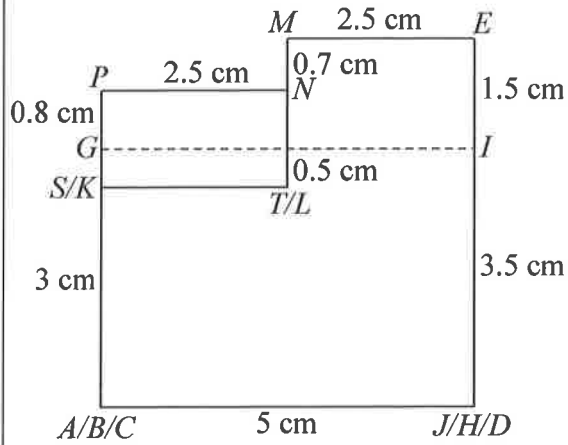
N1

1

12

15	(a)	 <p>Correct shape with rectangle $ABHJ$ and rectangle $BCDH$ (all solid lines)</p> <p>$BC > AB$</p> <p>Measurement correct to 0.2 cm (one way) and all right angles at vertices = $90^\circ \pm 1^\circ$.</p>	K1 K1 N1	3
	(b) i)	 <p>Correct shape triangle ABG and prism $BCMG$ (all solid line)</p> <p>$BC = CM > BG > CK > SK$</p> <p>Measurements correct to ± 0.2 cm (one way) and all right angles at vertices = $90^\circ \pm 1^\circ$.</p>	K1 K1 N2	4

ii)



Correct shape of *CDEMLK* and rectangle *STNP* (ignore *GI*)

K1

GI is joined by a dashed line to form a rectangle *GIHB*

K1

$CD = DE > GB > KC > PN > NT$

K1

Measurements correct to ± 0.2 cm (one way) and all right angles at vertices = $90^\circ \pm 1^\circ$.

N2

5

12

16	(a)	(45° N, 124° W) <u>Note:</u> 124° <u>or</u> $\theta^\circ W$ award P1	P1 P2	3
	(b)	$\frac{1620}{60}$ <u>or</u> 27° $45 - \frac{1620}{60}$ 18° N	K1 K1 N1	3
	(c)	(180 - 45 - 18) × 60 7020	K1 N1	2
	(d)	180° × 60 × cos 45° $\frac{180^\circ \times 60 \times \cos 45^\circ + 1620}{600}$ 15.43	K2 K1 N1	4
		<u>Note:</u> 180° <u>or</u> cos 45° correctly used, award K1		12
PERATURAN PEMARKAHAN TAMAT				