

**PROGRAM GEMPUR KECEMERLANGAN
SIJIL PELAJARAN MALAYSIA 2018**

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MATHEMATICS

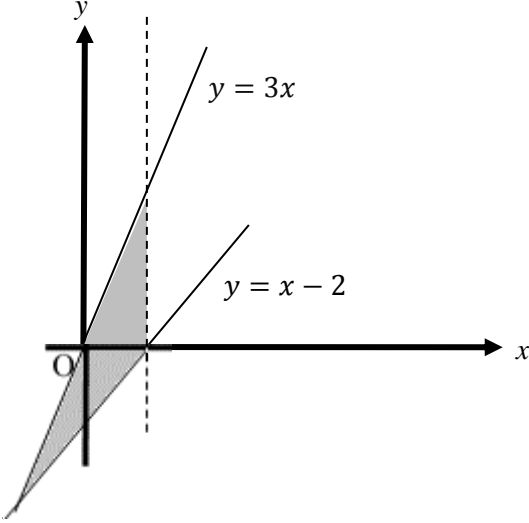
1449/2

Kertas 2

Peraturan Pemarkahan

Ogos

PERATURAN PEMARKAHAN

Question	Solution and Mark Scheme	Mark	Total
1	<div style="text-align: center;">  </div> <p data-bbox="334 867 833 900">Straight line $x = 2$, is drawn correctly</p> <p data-bbox="334 940 721 974">The region is shaded correctly</p> <p data-bbox="334 978 407 1012">Note:</p> <ol data-bbox="334 1016 1101 1121" style="list-style-type: none"> $x = 2$ is drawn in full line, give K1P1 Award P1 to shaded region bounded by two correct lines. (Check one vertex from any two correct lines) 	<p data-bbox="1276 867 1312 900">P1</p> <p data-bbox="1276 940 1312 974">P2</p>	3
2	$\frac{1}{2}[(x+1)+(2x+4)] \times (x+3) - \frac{1}{2}(x+3)(x+2) = 85$ $\frac{1}{2}(3x+5)(x+3) - \frac{1}{2}(x+3)(x+2) = 85$ $3x^2 + 14x + 15 - (x^2 + 5x + 6) = 170$ $2x^2 + 9x - 161 = 0$ $(x-7)(2x+23) = 0$ $x = 7 \quad x = -\frac{23}{2}$ <p data-bbox="334 1717 440 1751">$\therefore x = 7$</p> <p data-bbox="334 1787 407 1820">Note:</p> $\frac{1}{2}[(x+1)+(2x+4)] \times (x+3) \quad \text{or} \quad \frac{1}{2}(x+3)(x+2) \quad \text{seen award K1}$	<p data-bbox="1276 1476 1312 1509">K1</p> <p data-bbox="1276 1541 1312 1575">K1</p> <p data-bbox="1276 1625 1312 1659">K1</p> <p data-bbox="1276 1724 1312 1757">N1</p>	4

Question	Solution and Mark Scheme	Mark	Total
3	<p> $A + C = 125$ or $16A + 10C = 1820$ <u>or</u> equivalent $16A + 16C = 2000$ <u>or</u> $10A + 10C = 1250$ or equivalent OR $A = 125 - C$ <u>or</u> $C = 125 - A$ <u>or</u> equivalent P1 $6C = 180$ <u>or</u> $6A = 570$ <u>or</u> equivalent OR $\begin{pmatrix} A \\ C \end{pmatrix} = \frac{1}{1 \times 10 - 1 \times 16} \begin{pmatrix} 10 & -1 \\ -16 & 1 \end{pmatrix} \begin{pmatrix} 125 \\ 1820 \end{pmatrix}$ K2 Adult = 95 Children = 30 Note: $\begin{pmatrix} 10 & -1 \\ -16 & 1 \end{pmatrix} \begin{pmatrix} A \\ C \end{pmatrix} = \begin{pmatrix} 125 \\ 1820 \end{pmatrix}$ or correct inverse seen K1 </p>	P1 K1 N1 N1	5
4	<p>(a) $\angle FGH$ or $\angle HGF$</p> <p>(b) $\tan \angle FGH = \frac{1.5}{2.5}$ or equivalent 30.96° or $30^\circ 58'$</p>	P1 K1 N1	3
5	<p> $150 \times 45 \times 60$ <u>or</u> $\frac{1}{2} \times 40 \times 50 \times 60$ $\frac{150 \times 45 \times 60 + \frac{1}{2} \times 40 \times 50 \times 60}{90}$ 5167 <u>Note:</u> $150 \times 45 \times 60 + \frac{1}{2} \times 40 \times 50 \times 60$ <u>or</u> 465000 seen, award K1. </p>	K1 K2 N1	4

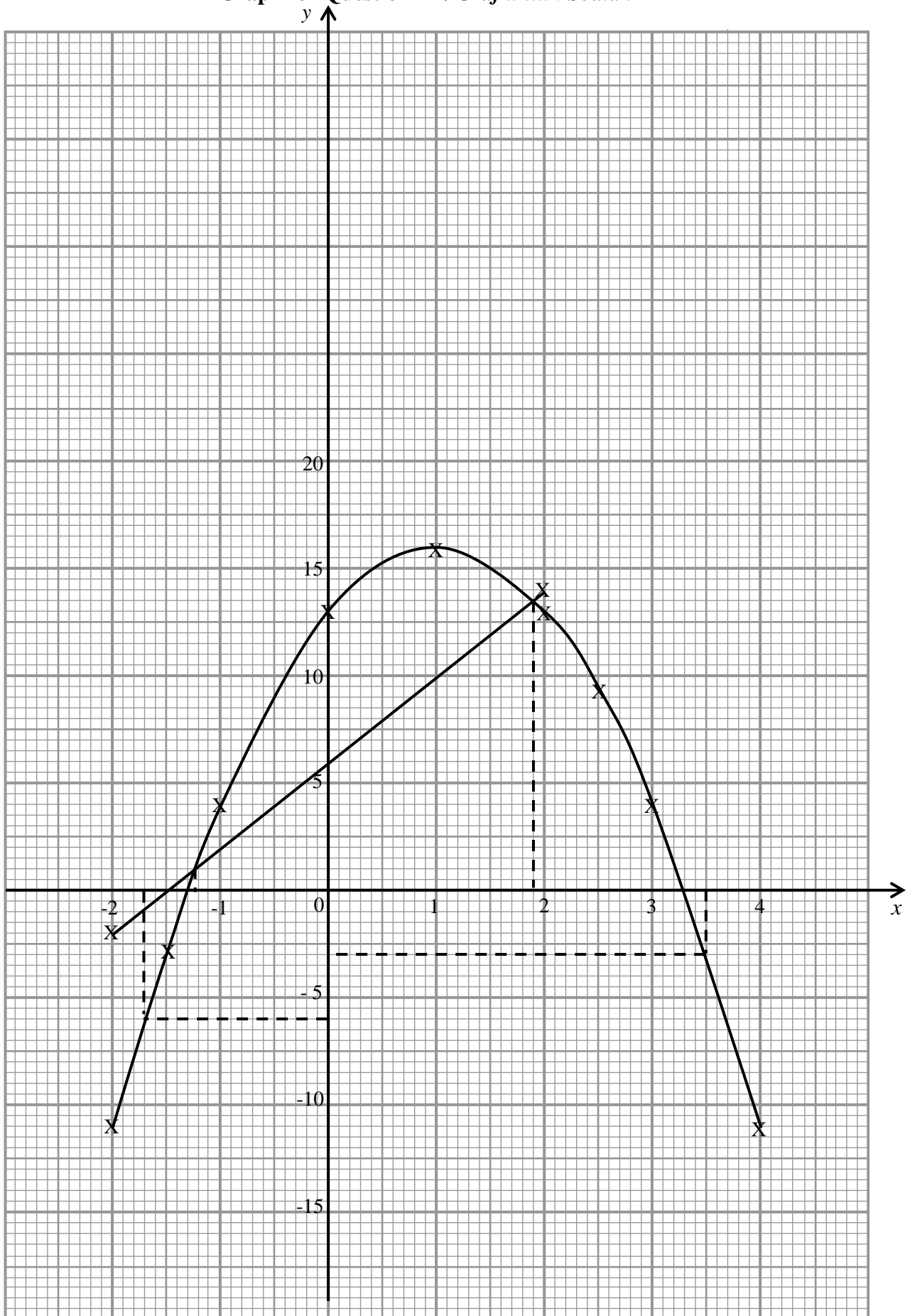
Question	Solution and Mark Scheme	Mark	Total
6	<p>(a) $\frac{1}{3}(x+0) = 1$ $x = 3$</p> <p>(b) $m_{RS} = m_{PQ} = -1$ $-5 = -1(3) + c$ or $y - (-5) = -1(x - 3)$ or equivalent $y = -x - 2$ or equivalent</p>	K1 N1 P1 K1 N1	5
7	<p>(a) Statement</p> <p>(b) <</p> <p>(c) $S \cup T = S$</p> <p>(d) $\frac{(7-2) \times 180}{7}$ 128.57</p>	P1 P1 P1 K1 N1	5
8	<p>(a) $36x + 5y = 297$ $45x + 8y = 387$ or equivalent</p> <p>(b) $\begin{pmatrix} 36 & 5 \\ 45 & 8 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 297 \\ 387 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{36(8) - 5(45)} \begin{pmatrix} 8 & -5 \\ -45 & 36 \end{pmatrix} \begin{pmatrix} 297 \\ 387 \end{pmatrix}$ $x = 7$ $y = 9$</p>	P1 P1 K1 K1 N1 N1	6

Question	Solution and Mark Scheme	Mark	Total
9	<p>(a) $2 \times \frac{22}{7} \times 35$</p> <p>$220 \times 12$</p> <p>$2640$</p> <p>(b) $7 \times 16 = 112$</p> <p>$112 - \left[\left(\frac{90}{360} \times \frac{22}{7} \times 7^2 \right) + \left(\frac{90}{360} \times \frac{22}{7} \times 7^2 \right) \right] = 35$ or $\frac{35}{10000} \times 18$</p> <p><i>RM 0.063</i></p>	<p>K1</p> <p>K1</p> <p>N1</p> <p>K1</p> <p>K1</p> <p>N1</p>	<p>6</p>
10	<p>(a) $\left\{ \begin{array}{l} (Ariff, Shahir), (Ariff, Emma), (Ariff, Gunalan), (Ariff, Filzah) \\ (Ben, Shahir), (Ben, Emma), (Ben, Gunalan), (Ben, Filzah), \\ (Chua, Shahir), (Chua, Emma), (Chua, Gunalan), (Chua, Filzah) \\ (Janet, Shahir), (Janet, Emma), (Janet, Gunalan), (Janet, Filzah) \end{array} \right\}$</p> <p>(b) (i) $\left\{ \begin{array}{l} (Ariff, Emma), (Ariff, Filzah), (Ben, Emma), \\ (Ben, Filzah), (Chua, Emma), (Chua, Filzah), \\ (Shahir, Janet), (Gunalan, Janet) \end{array} \right\}$</p> <p>$\frac{8}{16}$ or $\frac{1}{2}$</p> <p>(ii) $\left\{ \begin{array}{l} (Ariff, Emma), (Ariff, Filzah), (Ben, Emma), \\ (Ben, Filzah), (Chua, Emma), (Chua, Filzah), \\ (Janet, Shahir), (Janet, Emma), (Janet, Gunalan) \\ (Janet, Filzah) \end{array} \right\}$</p> <p>$\frac{10}{16}$ or $\frac{5}{8}$</p> <p>Note: 1. Allow two mistakes for P1 2. Accept answer without listing with complete sample space in 10 (a)</p>	<p>P2</p> <p>K1</p> <p>N1</p> <p>K1</p> <p>N1</p>	<p>6</p>

Question		Solution and Mark Scheme	Mark	Total
11	(a)	15	P1	5
	(b)	$\frac{20-0}{25-30}$ or $\frac{0-20}{30-25}$	K1	
		-4	N1	
	(c)	$\frac{1}{2}(v+20) \times 10 + 15 \times 20 + \frac{1}{2} \times 5 \times 20 = 525$	K1	
		15	N1	
	<u>Note:</u>			
	$\frac{1}{2}(v+20) \times 10$ seen, award K1			

Question	Solution and Mark Scheme	Mark	Total
12	<p>(a) -11 13</p> <p>(b) Axes drawn in correct directions with uniform scale for $-2 \leq x \leq 4$ and $-11 \leq y \leq 16$. <i>Paksi dilukis dalam arah yang betul dengan skala yang seragam bagi $-2 \leq x \leq 4$ dan $-11 \leq y \leq 16$.</i> All 9 points correctly plotted or curve passes through all the points for $-2 \leq x \leq 4$ and $-11 \leq y \leq 16$. <i>Semua 9 titik diplotkan dengan betul atau graf lengkung melalui semua titik bagi $-2 \leq x \leq 4$ dan $-11 \leq y \leq 16$.</i> A smooth and continuous curve without any straight line passes through all 9 correct points using the given scale for $-2 \leq x \leq 4$ and $-11 \leq y \leq 16$. <i>Satu lengkung yang licin dan berterusan tanpa garis lurus melalui kesemua 9 titik yang betul menggunakan skala yang diberi bagi $-2 \leq x \leq 4$ dan $-11 \leq y \leq 16$.</i></p> <p>(c) (i) $-3 \cdot 0 \leq y \leq -2 \cdot 0$ (ii) $-1 \cdot 8 < x \leq -1 \cdot 7$</p> <p>(d) Straight line $y = 4x + 6$ is drawn correctly. <i>Garis lurus $y = 4x + 6$ dilukis dengan betul.</i></p> <p>Note: Identify equation $y = 4x + 6$ award K1 <i>Kenal pasti persamaan $y = 4x + 6$.</i></p> <p>Values of x: <i>Nilai-nilai x:</i> $-1 \cdot 30 \leq x \leq -1 \cdot 10$ $1 \cdot 85 \leq x \leq 1 \cdot 95$</p> <p>Note: Values of x obtained by calculation, award N0</p>	<p>K1 K1 P1 K2 N1 P1 P1 K2 N1 N1</p>	<p>2 4 2 4</p>

Graph for Question 12 / Graf untuk Soalan 12

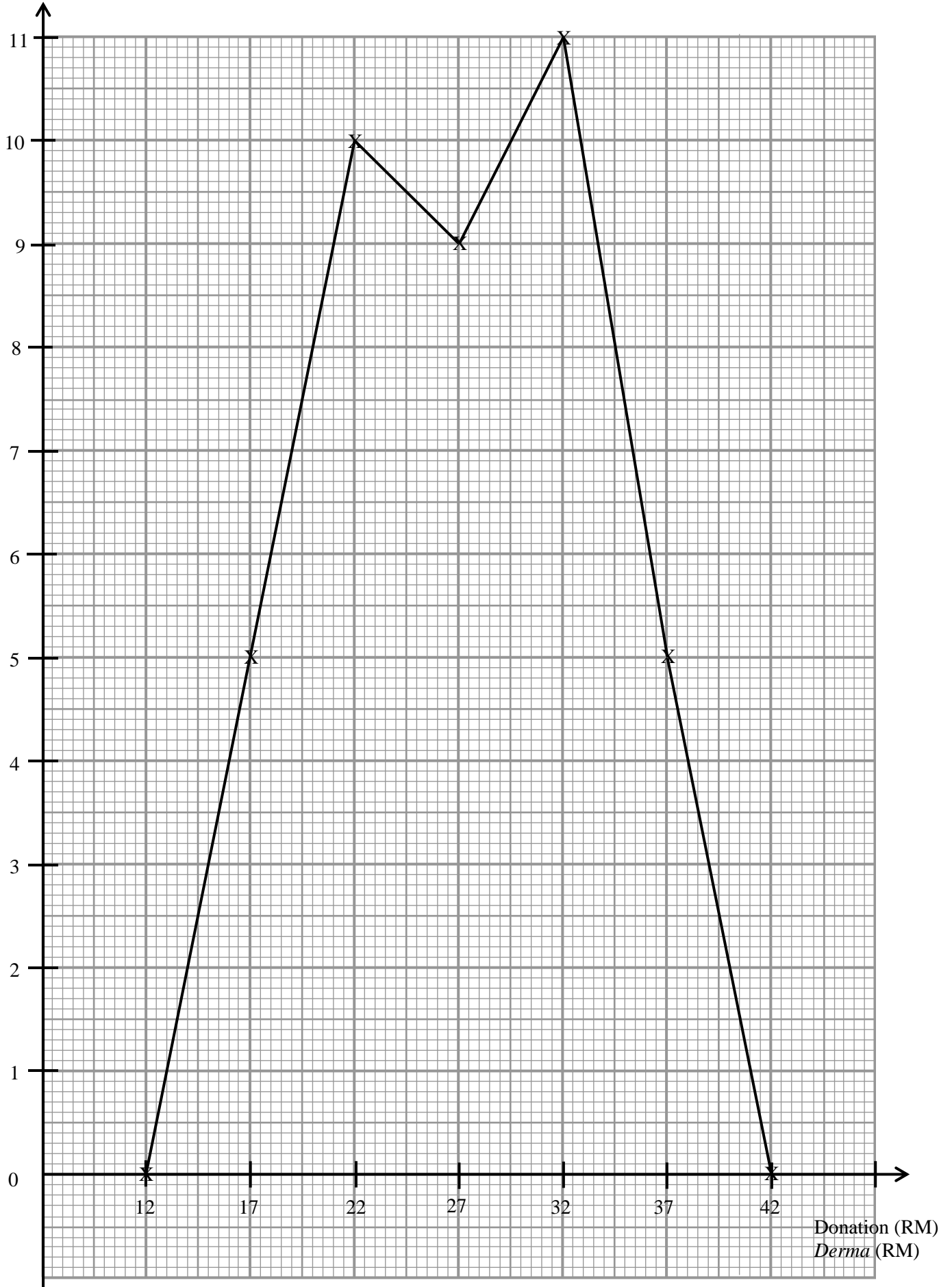


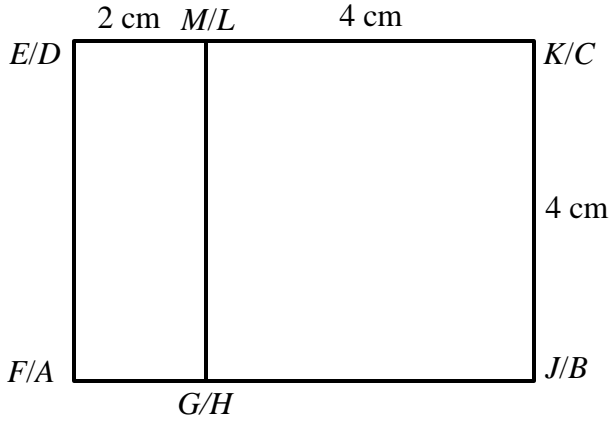
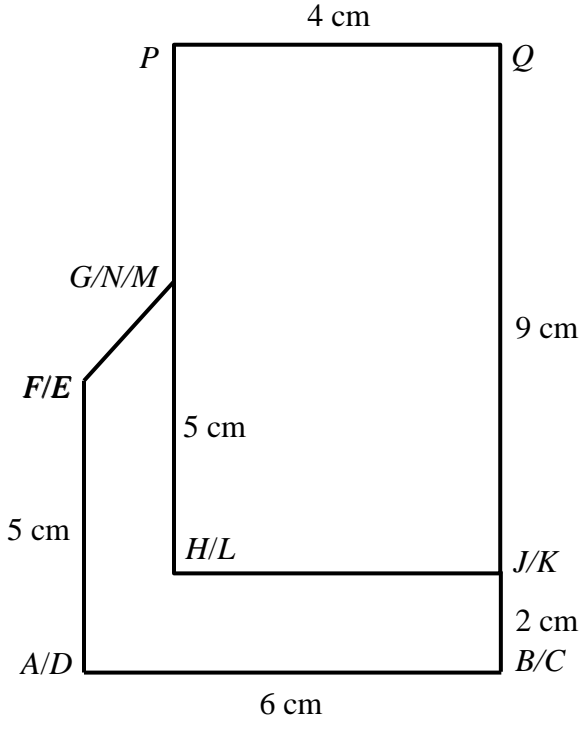
Question		Solution and Mark Scheme	Mark	Total
13	(a)	(i) (4, -1)	P1	3
		(ii) (1, 0)	P2	
		<p><u>Note:</u> (0, 3) marked on the diagram or (1, 0) seen or (0, 3) marked on the diagram, award P1.</p>		
	(b)	(i) (a) U = Rotation, 90^0 anticlockwise, at point A (5, 3) or equivalent U = Putaran 90^0 lawan arah jam pada pusat A (5, 3) atau setara	P3	
		(b) V = Enlargement, scale factor of 2, at point D (7,1) or equivalent V = Pembesaran dengan faktor skala 2 pada pusat D (7,1) atau setara	P3	
		OR		
		(a) U = Enlargement, scale factor of 2, at point A (5, 3) or equivalent (P3) U = Pembesaran dengan faktor skala 2 pada pusat A (5,3) atau setara (P3)		
		(b) V = Rotation, 90^0 anticlockwise, at point B (3, 3) or equivalent (P3) V = Putaran 90^0 lawan arah jam pada pusat B (3, 3) atau Setara (P3)		
		(ii) $60 \times (2^*)^2 - 60$	K2	
		<p><u>Note:</u> $60 \times (2^*)^2$ seen, award K1</p>		
		180	N1	9
				12

Question	Solution and Mark Scheme	Mark	Total																												
14	<table border="1" data-bbox="380 201 1170 548"> <thead> <tr> <th></th> <th>Donation (RM) <i>Derma (RM)</i></th> <th>Midpoint <i>Titik tengah</i></th> <th>Frequency <i>Kekerapan</i></th> </tr> </thead> <tbody> <tr> <td>I</td> <td>10 – 14</td> <td>12</td> <td>0</td> </tr> <tr> <td>II</td> <td>15 – 19</td> <td>17</td> <td>5</td> </tr> <tr> <td>III</td> <td>20 – 24</td> <td>22</td> <td>10</td> </tr> <tr> <td>IV</td> <td>25 – 29</td> <td>27</td> <td>9</td> </tr> <tr> <td>V</td> <td>30 – 34</td> <td>32</td> <td>11</td> </tr> <tr> <td>VI</td> <td>35 – 39</td> <td>37</td> <td>5</td> </tr> </tbody> </table> <p data-bbox="334 590 375 621">(a)</p> <p data-bbox="415 625 938 730">Class Interval : II to VI Midpoint : II to VI Frequency : II to VI</p> <p data-bbox="334 808 375 840">(b)</p> $\frac{17 \times 5 + 22 \times 10 + 27 \times 9 + 32 \times 11 + 37 \times 5}{5 + 10 + 9 + 11 + 5}$ <p data-bbox="391 961 483 993">$27 \cdot 125$</p> <p data-bbox="334 1037 375 1068">(c) Frequency Polygon</p> <p data-bbox="391 1073 959 1146">Uniform scale for $12 \leq x \leq 42$ and $0 \leq y \leq 11$ 7* points correctly plotted</p> <p data-bbox="391 1178 959 1209">Note: 5* or 6* points correctly plotted, award K1</p> <p data-bbox="391 1251 1138 1314">Continuos straight line passes through all points including point (12,0) dan (42, 0)</p> <p data-bbox="334 1356 1065 1388">(d) Any information from the correct frequency polygon</p>		Donation (RM) <i>Derma (RM)</i>	Midpoint <i>Titik tengah</i>	Frequency <i>Kekerapan</i>	I	10 – 14	12	0	II	15 – 19	17	5	III	20 – 24	22	10	IV	25 – 29	27	9	V	30 – 34	32	11	VI	35 – 39	37	5	<p data-bbox="1260 632 1300 726">P1 P1 P2</p> <p data-bbox="1260 852 1300 873">K2</p> <p data-bbox="1260 957 1300 978">N1</p> <p data-bbox="1260 1073 1300 1125">P1 K2</p> <p data-bbox="1260 1251 1300 1272">N1</p> <p data-bbox="1260 1367 1300 1388">P1</p>	<p data-bbox="1373 705 1398 726">4</p> <p data-bbox="1373 957 1398 978">3</p> <p data-bbox="1373 1251 1398 1272">4</p> <p data-bbox="1373 1367 1398 1388">1</p> <p data-bbox="1373 1514 1398 1535">12</p>
	Donation (RM) <i>Derma (RM)</i>	Midpoint <i>Titik tengah</i>	Frequency <i>Kekerapan</i>																												
I	10 – 14	12	0																												
II	15 – 19	17	5																												
III	20 – 24	22	10																												
IV	25 – 29	27	9																												
V	30 – 34	32	11																												
VI	35 – 39	37	5																												

Frequency
Kekerapan

Graph for Question 14 / Graf untuk Soalan 14



Question	Solution and Mark Scheme	Mark	Total
15	<p>(a)</p>  <p>Correct shape with rectangle $FJ > JK = KL > ME$ Measurement correct to $\pm 0.2\text{cm}$ (one way) and right-angles at vertices = $90^\circ \pm 1^\circ$ Note: Ignore label</p> <p>(b) (i)</p>  <p>Correct shape with rectangle HJPQ and hexagon ABJHGF All solid line $BQ > JQ > AB > AF = HG > GP = PQ$ Measurement correct to $\pm 0.2\text{cm}$ (one way) and all angle at a vertices = $90^\circ \pm 1^\circ$ Note: Ignore label</p>	<p>K1</p> <p>K1</p> <p>N1</p> <p>K1</p> <p>K1</p> <p>N2</p>	<p>3</p> <p>4</p>

Question	Solution and Mark Scheme	Mark	Total
15	<p data-bbox="261 170 305 205">(b)</p> <p data-bbox="334 170 378 205">(ii)</p> <div data-bbox="500 222 974 793" style="text-align: center;"> </div> <p data-bbox="334 831 792 867">Correct shape with rectangle BCSR</p> <p data-bbox="334 905 764 940">All solid lines (ignore FE or GM)</p> <p data-bbox="334 978 1062 1050">F – E joined by dashed line to form rectangle BCEF and G – M joined by dashed line to form rectangle BCMG</p> <p data-bbox="334 1087 889 1123">$BR > BG > BF > BC = RG > JF > BJ = FG$</p> <p data-bbox="334 1161 1114 1232">Measurements correct to $\pm 0.2\text{cm}$ (one way) and all angles at vertices = $90^\circ \pm 1^\circ$</p> <p data-bbox="334 1270 578 1306">Note: Ignore label</p>	<p data-bbox="1239 831 1279 867">K1</p> <p data-bbox="1239 978 1279 1014">K1</p> <p data-bbox="1239 1087 1279 1123">K1</p> <p data-bbox="1239 1161 1279 1197">N2</p>	<p data-bbox="1377 1161 1401 1197">5</p> <hr/> <p data-bbox="1377 1377 1401 1413">12</p>

Question		Solution and Mark Scheme	Mark	Total
16	(a)	$120^\circ - 30^\circ$	P1	3
		$(40^\circ \text{ S}, 90^\circ \text{ E/T})$	P2	
			K1	
	(b)	$\theta \times 60 \times \cos 40^\circ = 3\,447.2$	K1	3
		$90^\circ - 75^\circ$	K1	
		15° E/T	N1	
	(c)	$105^\circ \times 60 \times \cos 40^\circ$	K1	6
		$\frac{105^\circ \times 60 \times \cos 40^\circ}{650}$	K1	
		$\frac{105^\circ \times 60 \times \cos 40^\circ}{800}$	K1	
		$0545 + 0726$ or equivalent / <i>atau setara</i>	K1	
		$0700 + 0603$ or equivalent / <i>atau setara</i>	K1	
		Space Airline	N1	
				12