

**PROGRAM GEMPUR KECEMERLANGAN
SIJIL PELAJARAN MALAYSIA 2019**

SIJIL PELAJARAN MALAYSIA 2019

MATHEMATICS

1449/2

Kertas 2

Peraturan Pemarkahan

Ogos

PERATURAN PEMARKAHAN

Question	Solution and Mark Scheme	Mark	Total
1	$y \leq x + 6$ $x < -1$ $y \geq -x - 1$	P1 P1 P1	 3
2	(a) $\angle CSR$ or $\angle RSC$ (b) $\tan \theta = \frac{6}{12}$ or $\sin \theta = \frac{6}{\sqrt{12^2 + 6^2}}$ or $\cos \theta = \frac{12}{\sqrt{12^2 + 6^2}}$ or $\theta = \tan^{-1} \frac{6}{12}$ or equivalent 26.57° or $26^\circ 34'$	P1 K1 N1	1 2 3
3	$x^2 + 2x - 120 = 0$ $(x - 10)(x + 12) = 0$ OR $\frac{-2 \pm \sqrt{2^2 - 4(1)(-120)}}{2(1)}$ 10 Note : $x = 10, x = -12$ award N1	K1 K1 N2	 4
4	$y = 4x$ or equivalent $y - 3.75 = x + 3.75$ or equivalent $3x = 7.50$ or equivalent $2 \text{ kg } 500\text{g}$	K1 K1 K1 N1	 4

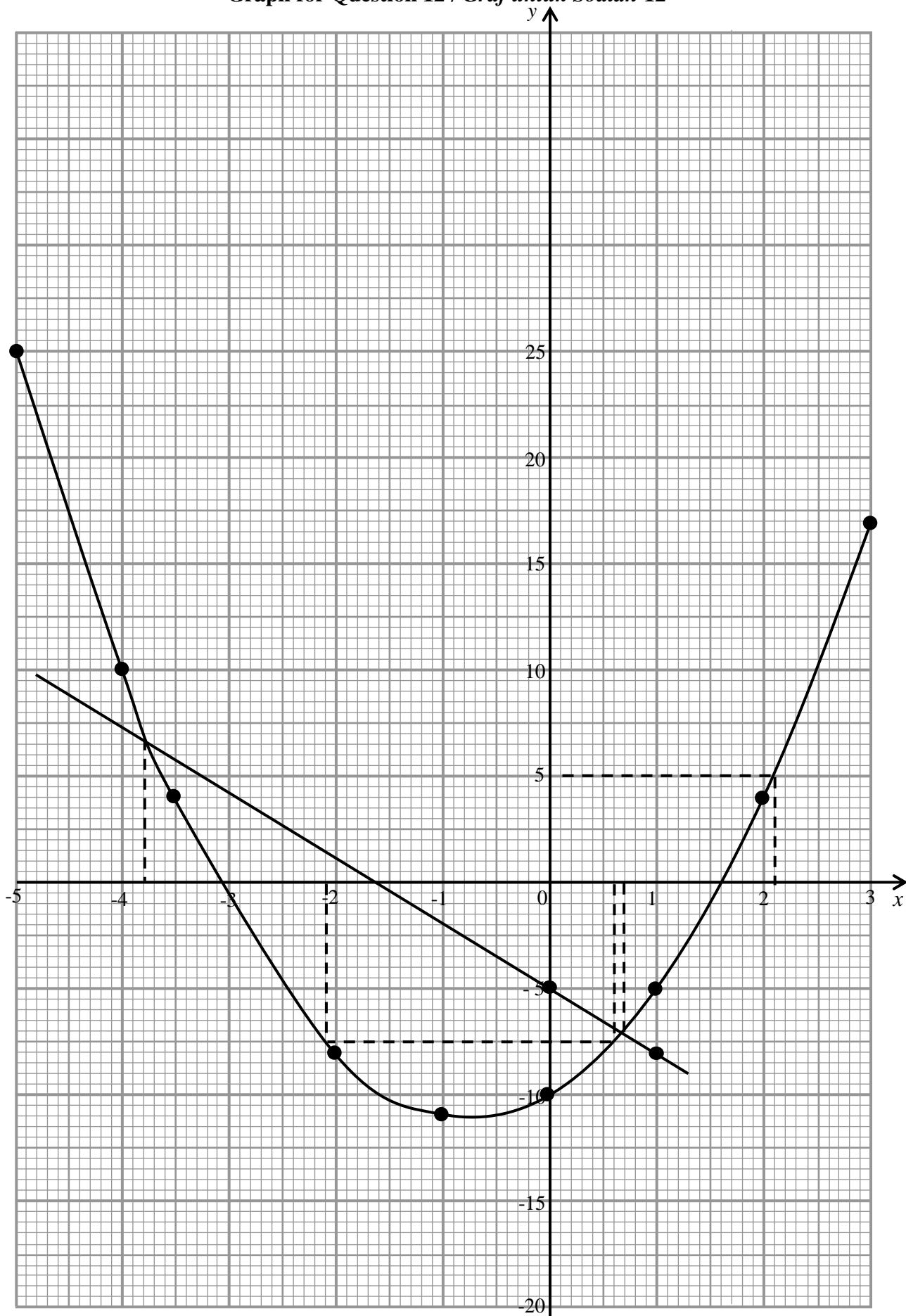
Question	Solution and Mark Scheme	Mark	Total
5	$\frac{1}{2} \times (6+8) \times 7 \times l \text{ or equivalent}$ $\frac{1}{2} \times \frac{22}{7} \times 4^2 \times 7 \text{ or equivalent}$ $\frac{1}{2} \times (6+8) \times 7 \times l - \frac{1}{2} \times \frac{22}{7} \times 4^2 \times 7 = 412 \text{ or equivalent}$ <p>12</p> <p><u>Note :</u></p> <p>1. Accept π for K mark 2. Accept correct value from incomplete substitution for K mark 3. Correct answer from incomplete working, award Kk2</p>	<p>K1</p> <p>K1</p> <p>K1</p> <p>N1</p>	<p>4</p>
6	<p>(a) (i) 43 is a multiple of 3 and a prime number</p> <p>(ii) False</p> <p>(b) If $\sqrt{9} + k = 12$, then $k = 9$</p> <p>(c) $3 \times n^2 - 2, n = 1, 2, 3, 4, \dots$</p> <p><u>Note :</u></p> <p>$3 \times n^2 - 2$ award K1</p>	<p>P1</p> <p>P1</p> <p>P1</p> <p>K2</p>	<p>2</p> <p>1</p> <p>2</p> <p>5</p>
7	<p>$m_1 = m_2 = -2$</p> <p>$5 = -2(-4) + c \text{ or } c = -3$</p> <p>OR</p> $\frac{y-5}{x-(-4)} = -2$ <p>$y = -2x - 3$</p> <p>$0 = -2x - 3 \text{ or } 0 = -2k - 3 \text{ OR } \frac{0-5}{k-(-4)} = -2 \text{ OR } -2 = -\frac{(-3)}{k}$</p> <p>$x = -\frac{3}{2} \text{ or } k = -\frac{3}{2}$</p>	<p>P1</p> <p>K1</p> <p>N1</p> <p>K1</p> <p>N1</p>	<p>3</p> <p>2</p> <p>5</p>

Question		Solution and Mark Scheme	Mark	Total																								
8	(a)	30	P1	1																								
	(b)	$\frac{30-0}{25-50}$ or equivalent	K1	2																								
		$-1 \cdot 2$ or $-\frac{6}{5}$	N1																									
	(c)	$\frac{1}{2}(25+50) \times 30 + \frac{1}{2}(u-30) \times 15 = 1260$	K2	3																								
	48	N1																										
	Note : $\frac{1}{2}(25+50) \times 30$ or $\frac{1}{2}(u-30) \times 15$ seen award K1		6																									
9	(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Appel <i>Epal (A)</i></th> <th>Banana <i>Pisang (B)</i></th> <th>Watermalon <i>Tembikai (W)</i></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1 , A)</td> <td>(1 , B)</td> <td>(1 , W)</td> </tr> <tr> <td>2</td> <td>(2 , A)</td> <td>(2 , B)</td> <td>(2 , W)</td> </tr> <tr> <td>3</td> <td>(3 , A)</td> <td>(3 , B)</td> <td>(3 , W)</td> </tr> <tr> <td>4</td> <td>(4 , A)</td> <td>(4 , B)</td> <td>(4 , W)</td> </tr> <tr> <td>5</td> <td>(5 , A)</td> <td>(5 , B)</td> <td>(5 , W)</td> </tr> </tbody> </table>		Appel <i>Epal (A)</i>	Banana <i>Pisang (B)</i>	Watermalon <i>Tembikai (W)</i>	1	(1 , A)	(1 , B)	(1 , W)	2	(2 , A)	(2 , B)	(2 , W)	3	(3 , A)	(3 , B)	(3 , W)	4	(4 , A)	(4 , B)	(4 , W)	5	(5 , A)	(5 , B)	(5 , W)	P2	2
			Appel <i>Epal (A)</i>	Banana <i>Pisang (B)</i>	Watermalon <i>Tembikai (W)</i>																							
		1	(1 , A)	(1 , B)	(1 , W)																							
		2	(2 , A)	(2 , B)	(2 , W)																							
3	(3 , A)	(3 , B)	(3 , W)																									
4	(4 , A)	(4 , B)	(4 , W)																									
5	(5 , A)	(5 , B)	(5 , W)																									
	Note : 1. Accept correct combination 2. Allow 2 mistake for P1																											
(b)	(i) (1 , A) (1 , W) , (1 , B) , (2 , A) , (3 , A) , (4 , A) , (5 , A) $\frac{7}{15}$	K1	4																									
	(ii) (2 , B) , (3 , B) , (5 , B) $\frac{3}{15}$	K1																										
	Note : Accept correct answer without working from correct listing for K1N1	N1	6																									
	NOTE : 1. Accept listing without brackets 2. Accept using alphabets only																											

Question	Solution and Mark Scheme	Mark	Total
10	<p>(a) $\left[\frac{120}{360} \times 2 \times \frac{22}{7} \times r \right]$ $2r + \left[\frac{120}{360} \times 2 \times \frac{22}{7} \times r \right] = 57\frac{1}{3}$ 14</p> <p>(b) $\left[\frac{120}{360} \times \frac{22}{7} \times 14 \times 14 \right]$ or $\left[\frac{40}{360} \times \frac{22}{7} \times 7 \times 7 \right]$ $\left[\frac{120}{360} \times \frac{22}{7} \times 14 \times 14 \right] - \left[\frac{40}{360} \times \frac{22}{7} \times 7 \times 7 \right]$ $188\frac{2}{9}$ or 188.22 or $\frac{1694}{9}$</p>	K1 K1 N1 K1 K1 N1	3 3 6
11	<p>(a) $\frac{1}{14} \begin{pmatrix} 4 & -3 \\ -2 & 5 \end{pmatrix}$ or $\begin{pmatrix} \frac{2}{7} & \frac{-3}{14} \\ \frac{-1}{7} & \frac{5}{14} \end{pmatrix}$ <u>Note :</u> $\frac{1}{(5)(4) - (3)(2)} \begin{pmatrix} 4 & -3 \\ -2 & 5 \end{pmatrix}$ seen award P1</p> <p>(b) $\begin{pmatrix} 5 & 3 \\ 2 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 26 \\ 16 \end{pmatrix}$ $= \frac{1}{20-6} \begin{pmatrix} 4 & -3 \\ -2 & 5 \end{pmatrix} \begin{pmatrix} 26 \\ 16 \end{pmatrix}$ or $\begin{pmatrix} *inverse \\ matrix \end{pmatrix} \begin{pmatrix} 26 \\ 16 \end{pmatrix}$ <u>Note :</u> Do not accept $\begin{pmatrix} inverse \\ matrix \end{pmatrix} = \begin{pmatrix} 5 & 3 \\ 2 & 4 \end{pmatrix}$ or $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ $x = 4$ $y = 2$ <u>Note :</u> 1. $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ as a final answer, award N1 2. Do not accept any solution solved not using matrix method.</p>	P2 P1 K1 N1 N1	2 4 6

Question		Solution and Mark Scheme	Mark	Total
12	(a)	- 8	K1	2
		17	K1	
	(b)	Axes drawn in correct directions with uniform scale for $-5 \leq x \leq 3$ and $-11 \leq y \leq 25$.	P1	4
		All 7 and *2 points correctly plotted or curve passes through all the points for $-5 \leq x \leq 3$ and $-11 \leq y \leq 25$.	K2	
		A smooth and continuous curve without any straight line passes through all 9 correct points using the given scale for $-5 \leq x \leq 3$ and $-11 \leq y \leq 25$.	N1	
	(c)	(i) $4.5 \leq y \leq 5.5$	P1	2
		(ii) $-2.0 < x \leq -2.2$	P1	
	(d)	Straight line $y = -3x - 5$ is drawn correctly. (Check any two points are plotted or the straight line passed through $(-5, 10), (-4, 7), (-3, 4), (-2, 1), (0, -5), \dots$)	K2	4
		Note: Identify equation $y = -3x - 5$ award K1		
		Values of x : $-3.70 \leq x \leq -3.90$ $0.6 \leq x \leq 0.8$	N1 N1	
Note: Values of x obtained by calculation, award N0 $x = 0.6794, -3.6794$				
				12

Graph for Question 12 / Graf untuk Soalan 12

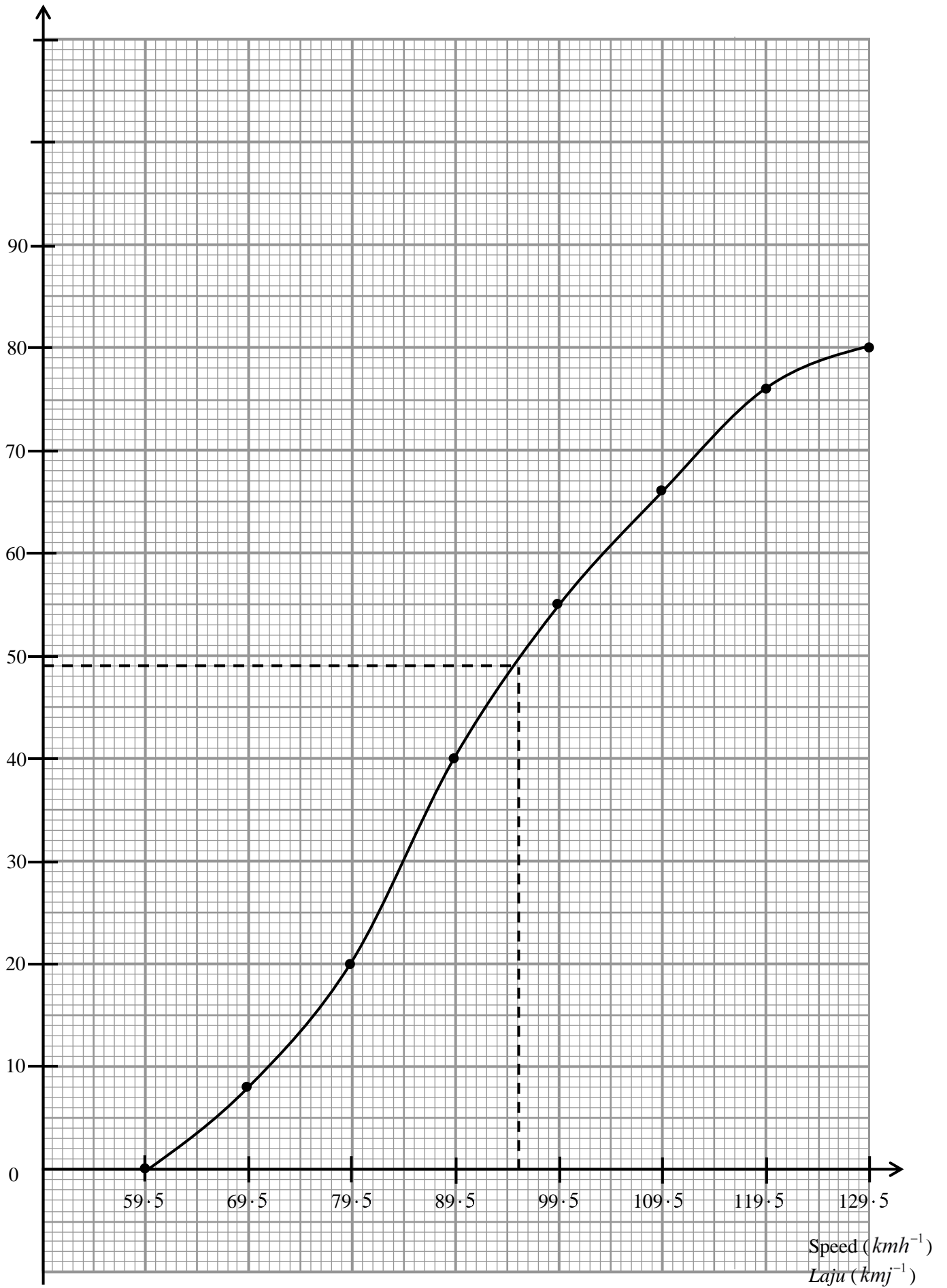


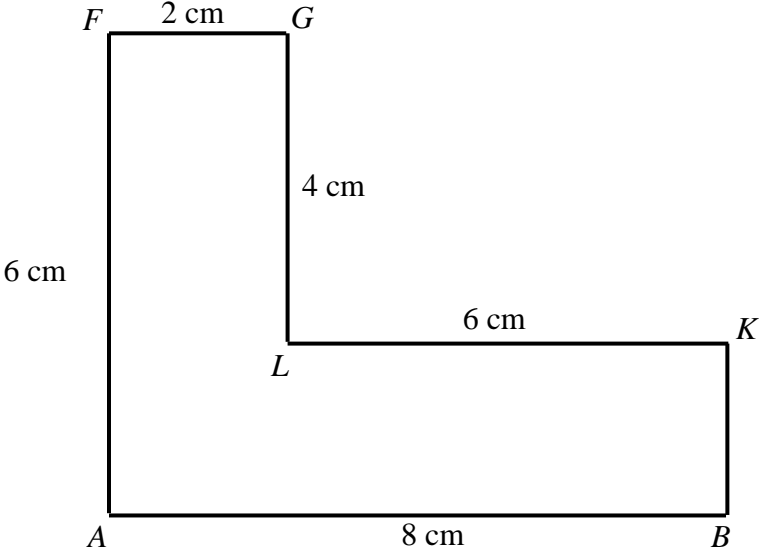
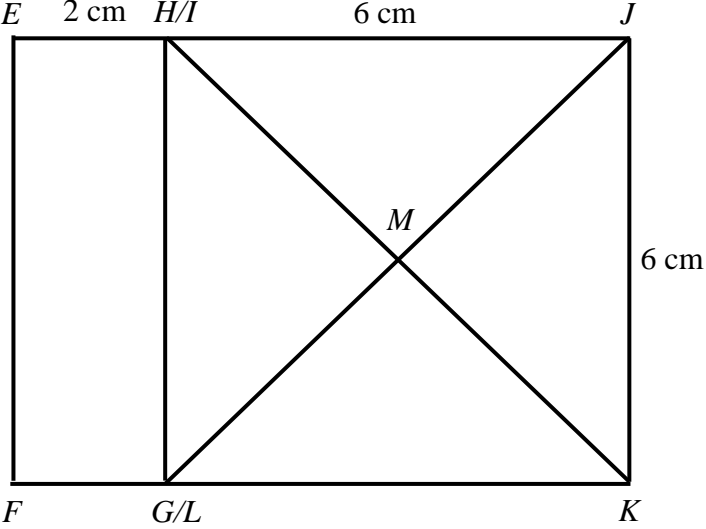
Question		Solution and Mark Scheme	Mark	Total
13	(a)	(i) (2, 1)	P2	4
		<u>Note:</u> (2, 1) marked on the diagram or (4, 2) seen or (4, 2) marked on the diagram, award P1.		
	(b)	(ii) (3, - 1)	P2	5
		<u>Note:</u> (3, - 1) marked on the diagram or (5, 0) seen or (5, 0) marked on the diagram, award P1.		
	(i) (a) \mathbf{V} = Reflection in the line $x = 7$ or equivalent <i>Pantulan pada garis $x = 7$</i>	P2		
	<u>Note:</u> Reflection // <i>Pantulan</i> award P1			
	(b) \mathbf{U} = Enlargement of scale factor 2 with centre $F(8, 3)$ or equivalent <i>Pembesaran dengan faktor skala 2 pada pusat $F(8, 3)$</i>	P3		
	<u>Note :</u> 1. Enlargement of scale factor 2 // Enlargement with centre $F(8, 3)$ award P2 <i>Pembesaran dengan faktor skala 2 // Pembesaran pada pusat $F(8, 3)$</i> 2. Enlargement // <i>Pembesaran</i> award P1			
	OR			
	(a) \mathbf{U} = Enlargement of scale factor 2 with centre $B(6, 3)$ or equivalent (P3) <i>Pembesaran dengan faktor skala 2 pada pusat $F(8, 3)$</i>			
	(b) \mathbf{V} = Reflection in the line $x = 7$ or equivalent (P2) <i>Pantulan pada garis $x = 7$</i>			
	(ii) $20 \times (2^*)^2 - 20$ or 3×20 or $\frac{20}{6} \times 18$ or $\frac{20}{12} \times 48 - 20$ or equivalent	K2		
	<u>Note:</u> $20 \times (2^*)^2$ seen, award K1			
	60	N1	3	
			12	

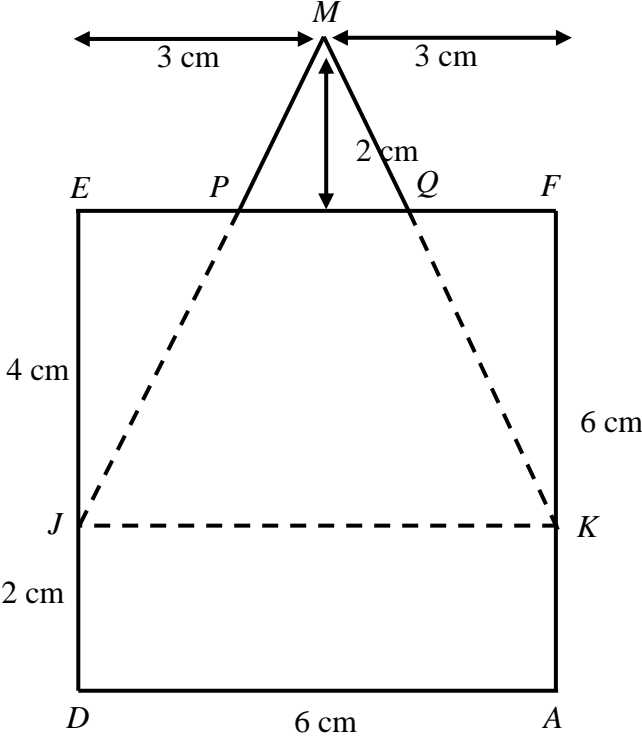
Question	Solution and Mark Scheme	Mark	Total																											
14	(a) (i) 80 - 89	P1	1																											
	(ii)																													
	<table border="1"> <thead> <tr> <th><i>Titik tengah Midpoint</i></th> <th><i>Sempadan Atas Upper Boundary</i></th> <th><i>Kekerapan Longgokan Cumulative frequency</i></th> </tr> </thead> <tbody> <tr><td>54.5</td><td>59.5</td><td>0</td></tr> <tr><td>64.5</td><td>69.5</td><td>8</td></tr> <tr><td>74.5</td><td>79.5</td><td>20</td></tr> <tr><td>84.5</td><td>89.5</td><td>40</td></tr> <tr><td>94.5</td><td>99.5</td><td>55</td></tr> <tr><td>104.5</td><td>109.5</td><td>66</td></tr> <tr><td>114.5</td><td>119.5</td><td>76</td></tr> <tr><td>124.5</td><td>129.5</td><td>80</td></tr> </tbody> </table>	<i>Titik tengah Midpoint</i>	<i>Sempadan Atas Upper Boundary</i>	<i>Kekerapan Longgokan Cumulative frequency</i>	54.5	59.5	0	64.5	69.5	8	74.5	79.5	20	84.5	89.5	40	94.5	99.5	55	104.5	109.5	66	114.5	119.5	76	124.5	129.5	80		
<i>Titik tengah Midpoint</i>	<i>Sempadan Atas Upper Boundary</i>	<i>Kekerapan Longgokan Cumulative frequency</i>																												
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104.5	109.5	66																												
114.5	119.5	76																												
124.5	129.5	80																												
	Midpoint Upper boundary Cumulative Frequency	P1 P1 P1	3																											
	(b)																													
	$\text{Min} = \frac{(64.5 \times 8) + (74.5 \times 12) + (84.5 \times 20) + (94.5 \times 15) + (104.5 \times 11) + (114.5 \times 10) + (114.5 \times 10) + (124.5 \times 4)}{8 + 12 + 20 + 15 + 11 + 10 + 4}$	K2																												
	Note : 1. Allow two mistakes in frequency or *midpoint for K1 2. Allow two mistakes for multiplication for K1																													
	$\frac{731}{8}$ or $91\frac{3}{8}$ or 91.38	N1	3																											
	Note : Correct answer from incomplete working, award Kk2.																													
	(c) <u>Ogive</u> Axes are drawn in the correction directions with uniform scales for $59.5 \leq x \leq 129.5$ and $0 \leq y \leq 80$ 1 point and *7 point are correctly plotted, or the line passes through all the points Correct and continuous ogive using the given scale.	P1 K2 N1	4																											
	Note : 6 or 7 points are correctly plotted award K1																													
	(d) $\frac{80 - *49}{80} \times 100$ *38.75	K1	1																											
	Note: 1. Do not accept answer without ogive		12																											

Cumulative Frequency
Kekerapan Longgokan

Graph for Question 14 / *Graf untuk Soalan 14*



Question	Solution and Mark Scheme	Mark	Total
15	<p>(a)</p>  <p>Correct shape with hexagon ABKLG F. All solid lines.</p> <p>$AB > AF = LK > GL > BK = GF$</p> <p>Measurements correct to ± 0.2 cm (one way) and all angles at vertices = $90^\circ \pm 1^\circ$.</p> <p>(b)</p>  <p>Correct shape with rectangles EJKF and EFGH, triangles HMG, JMH, KMJ and GMK. All solid lines.</p> <p>$FK > KJ = JH = EF > EH = FG$</p> <p>Measurements correct to ± 0.2 cm (one way) and all angles at vertices = $90^\circ \pm 1^\circ$.</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="266 174 375 205">(b) (ii)</p>  <p data-bbox="334 1087 1182 1157">Correct shape with rectangles AFED and isosceles triangles PMQ. All solid lines. Ignore dashed line.</p> <p data-bbox="334 1199 1133 1230">PJ, JK and KQ joined by dashed line to form trapezium PJKQ.</p> <p data-bbox="334 1272 727 1304">$AF = FE > EJ > EP = QF = JD$</p> <p data-bbox="334 1346 1122 1415">Measurements correct to ± 0.2 cm (one way) and all angles at vertices = $90^\circ \pm 1^\circ$.</p>	<p data-bbox="1243 1087 1279 1119">K1</p> <p data-bbox="1243 1199 1279 1230">K1</p> <p data-bbox="1243 1272 1279 1304">K1</p> <p data-bbox="1243 1346 1279 1377">N2</p>	<p data-bbox="1377 1346 1401 1377">5</p> <hr/> <p data-bbox="1377 1566 1409 1598">12</p>

Question	Solution and Mark Scheme	Mark	Total
16	<p>(a) $(40^\circ \text{ N//U}, 145^\circ \text{ W//B})$ Note : 145° E//T or $\theta^\circ \text{ W//B}$ award P1</p> <p>(b) $(180 - 40 - 40) \times 60$ 6000</p> <p>(c) $5820 = \theta \times 60$ or 97 $97 - 40$ or 57 57° S</p> <p>(d) $25 \times 60 \times \cos 40$ Note : $\cos 40$ correctly used award K1 $\frac{*1149.07 + 5820}{600}$ 11.62</p>	P1P2 K1 N1 K1 K1 N1 K2 K1 N1	3 2 3 4
			12