

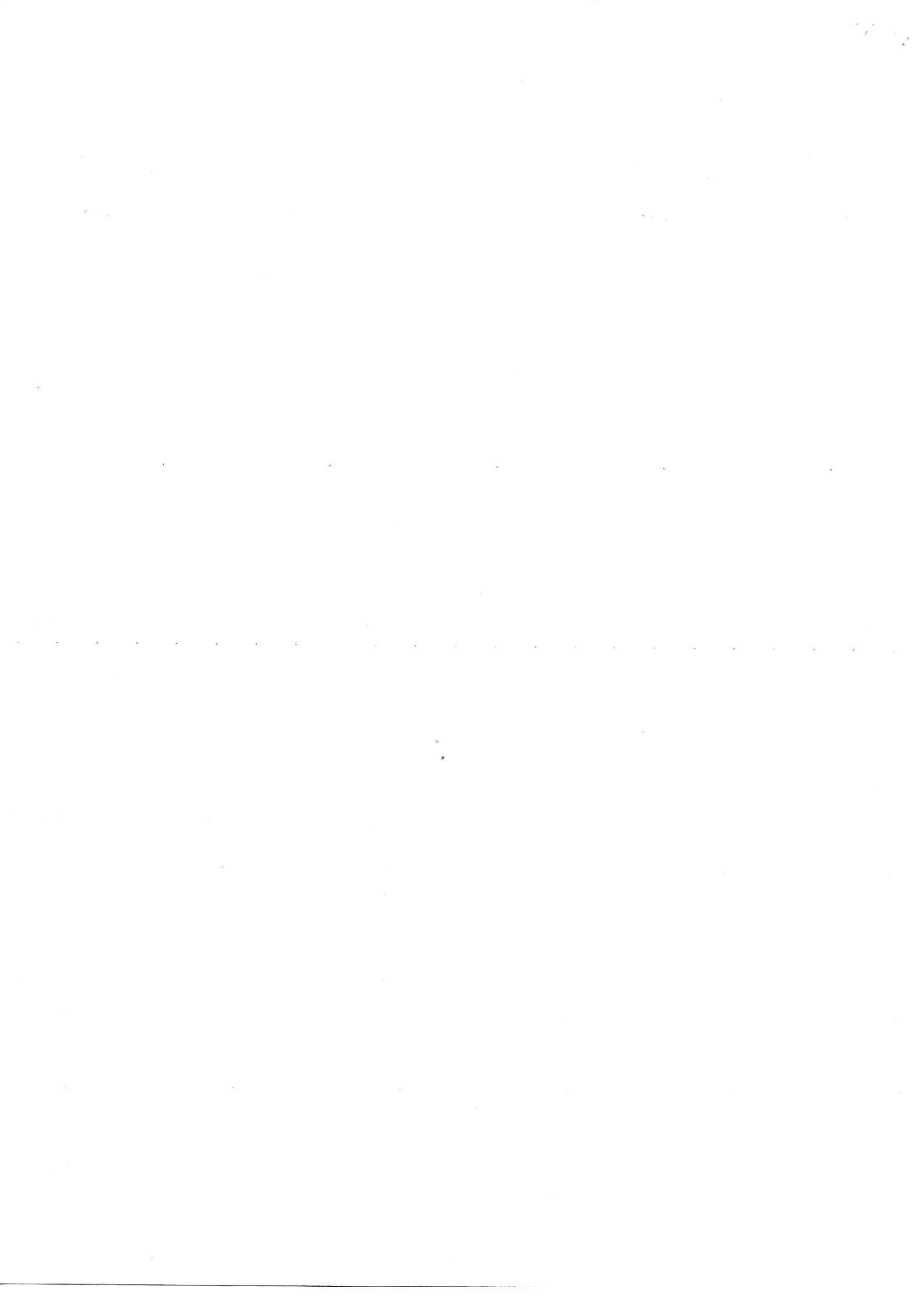


**MAJLIS PENGETUA SEKOLAH MALAYSIA  
(CAWANGAN PULAU PINANG)**

**MODUL BERFOKUS KBAT SPM  
MATHEMATICS  
KERTAS 1**

**Answers  
Skema Jawapan**

<b>Question Number</b>	<b>Answer</b>						
1	D	11	D	21	B	31	B
2	D	12	D	22	B	32	C
3	B	13	B	23	D	33	B
4	B	14	C	24	C	34	D
5	A	15	B	25	B	35	C
6	B	16	D	26	A	36	B
7	C	17	C	27	B	37	A
8	C	18	C	28	C	38	A
9	B	19	A	29	D	39	A
10	B	20	B	30	A	40	A





MAJLIS PENGETUA SEKOLAH MALAYSIA  
(CAWANGAN PULAU PINANG)

MODUL BERFOKUS KBAT SPM  
1449/2(PP)

MATEMATIK

KERTAS 2

PERATURAN PEMARKAHAN

---

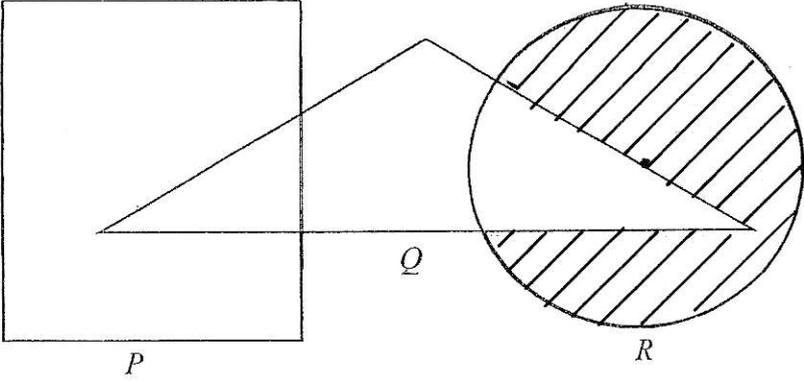
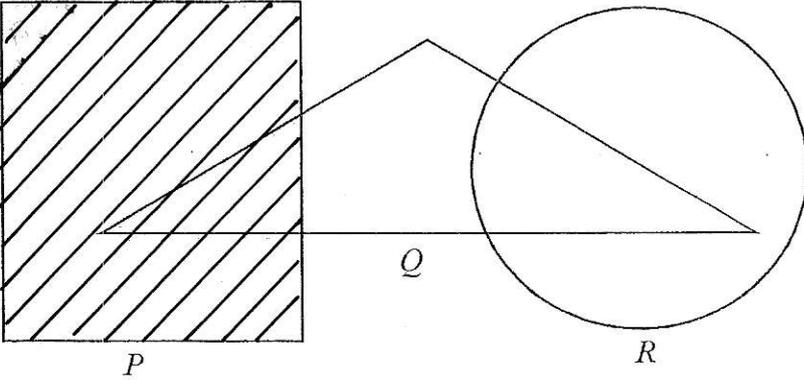
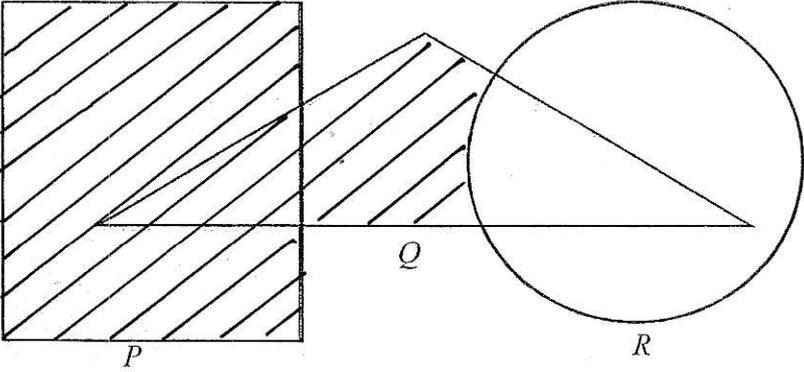
UNTUK KEGUNAAN PEMERIKSA SAHAJA

**AMARAN**

Peraturan pemarkahan ini adalah **SULIT** dan **Hak Cipta MPSM Pulau Pinang**. Kegunaannya khusus untuk pemeriksa yang berkenaan sahaja. Sebarang maklumat dalam peraturan pemarkahan ini tidak boleh dimaklumkan kepada sesiapa. Peraturan pemarkahan ini tidak boleh dikeluarkan dalam apa-apa bentuk media.

---

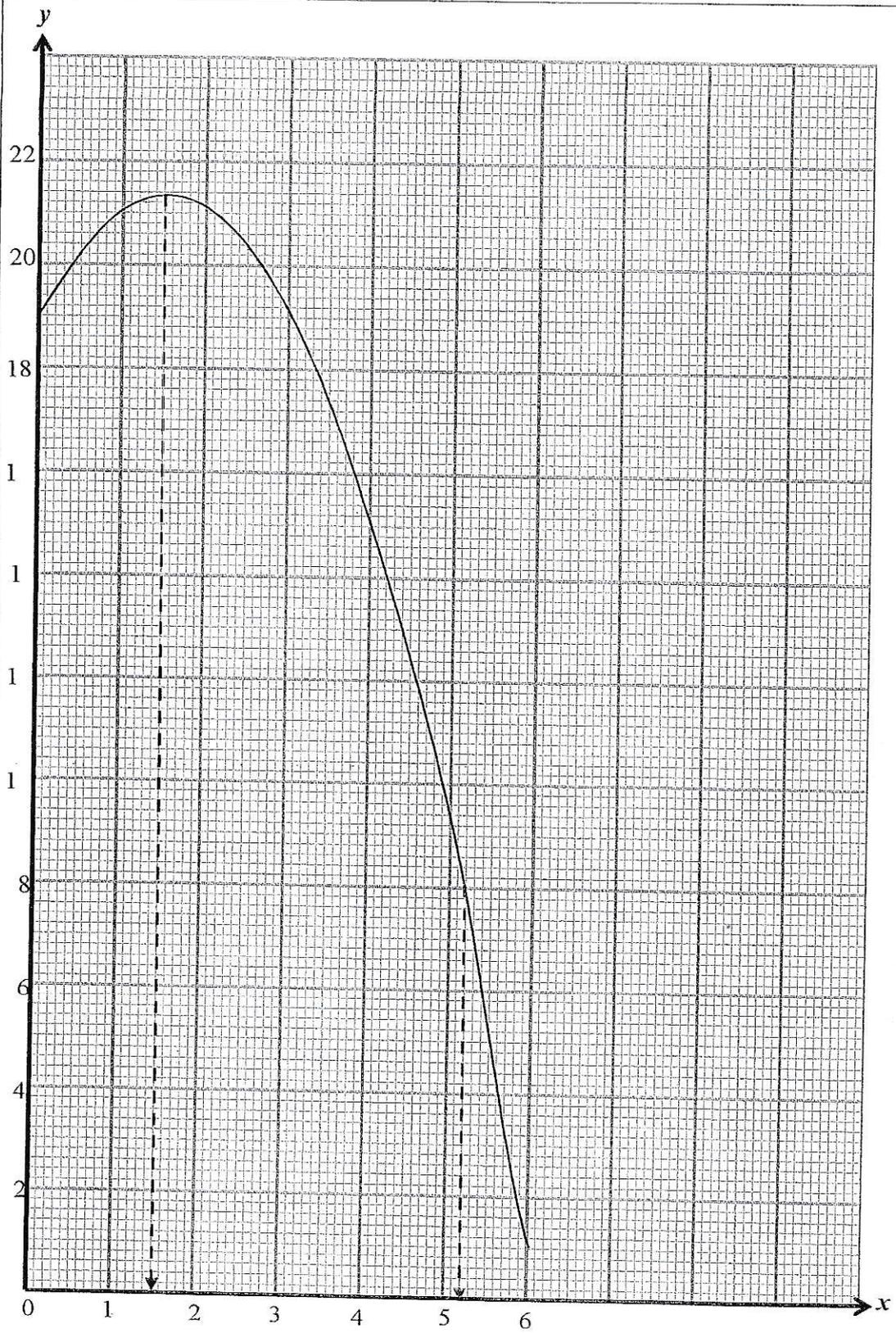
Peraturan pemarkahan ini mengandungi 10 halaman bercetak

No		Marks
1	<p>(a)</p>  <p>(b)</p>  <p>Note: Region <math>Q \cup R'</math> shaded correctly, award P1.</p> 	<p>P1</p> <p>P2</p> <p>3 marks</p>
2	$16x - 6y = 40 \quad \text{or} \quad x = -6y - 23$ $17x = 17 \quad \text{or} \quad -\frac{51}{4}y = 51$ $x = 1$ $y = -4$	<p>K1</p> <p>K1</p> <p>N1</p> <p>N1</p> <p>4 marks</p>

3	$\frac{1}{2}(x+2)(x+3) = 28$ $(x-5)(x+10) = 0$ $x = 5, \quad x = -10 \text{ (ignored)}$ $\text{Length of } MN = 13$	K1 K1 K1 N1
		4 marks
4	(a) $\angle RVW$ @ 4 WVR (b) $\tan \angle RVW = \frac{9}{7}$ $\angle RVW = 52.13^\circ$ or $52^\circ 8'$	P1 K1 N1
		3 marks
5	$\frac{1}{2}(5+3)(5)(5)$ $(5)(3)(7)$ $\frac{1}{2}(5+3)(5)(5) + (5)(3)(7)$ $205 \text{ cm}^3$	K1 K1 K1 N1
		4 marks
6	Non-statement / <i>Bukan Pernyataan.</i>  $y = 5x + 7$ is a linear equation. $y = 5x + 7$ ialah persamaan linear.  $2^4 = 16$	P1 P1 K1 N1
		4 marks
7	(a) $0 = -\frac{1}{2}x - 1$ $x\text{-intercept} = -2$  (b) $m = -\frac{1}{2}$ $1 = -\frac{1}{2}(6) + c$ or $c = 4$ $y = -\frac{1}{2}x + 4$  (c) $x = -2$	K1 N1 P1 K1 N1  P1
		6 marks

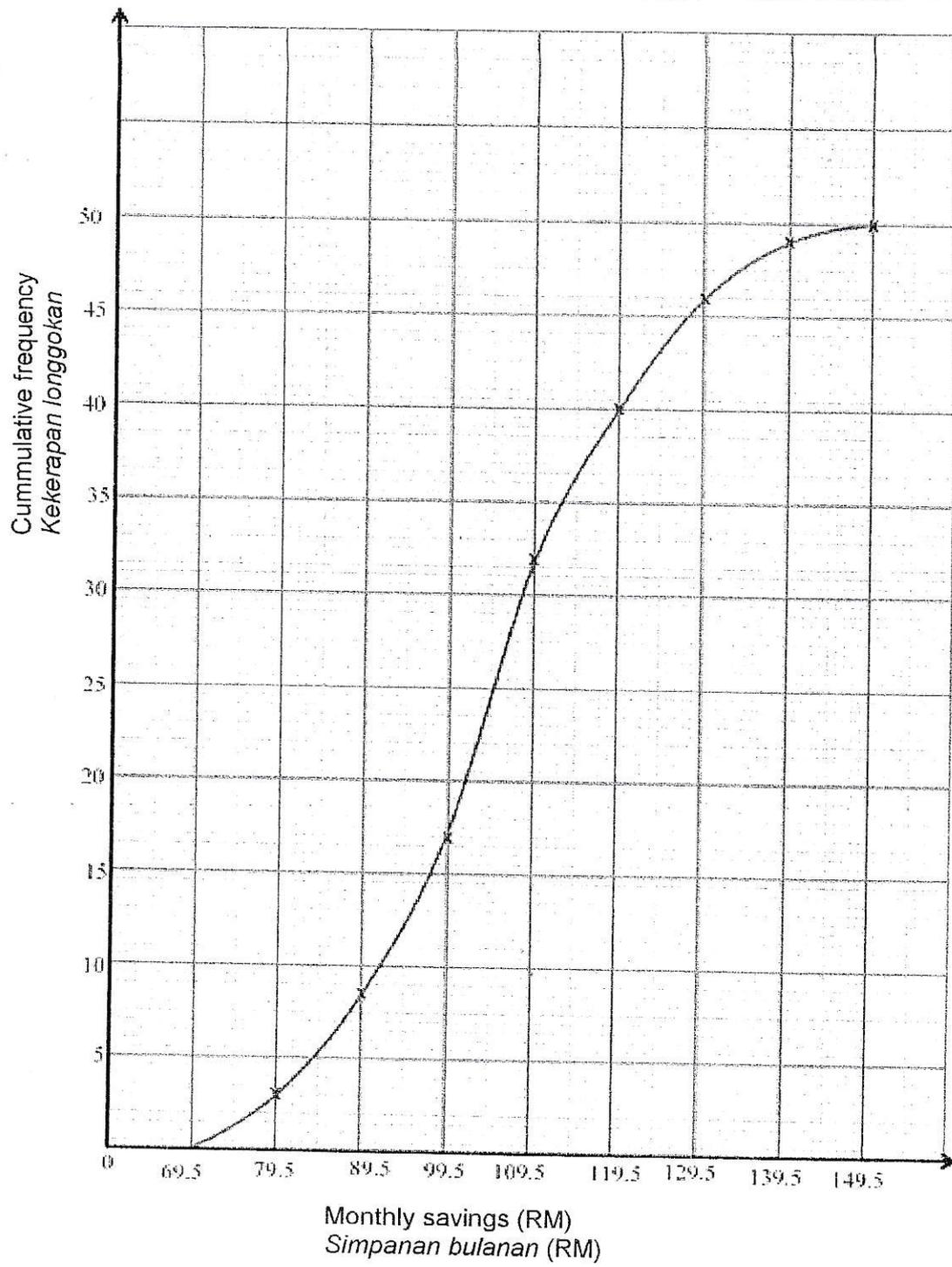
8	<p>(a) 2</p> <p>(b) <math>\frac{20-0}{4-0} = 5</math></p> <p>(c) <math>\frac{1}{2}(2+6)(20)</math> or <math>\frac{1}{2}(20+v)(4)</math> or any correct geometric area  <math>\frac{1}{2}(2+6)(20) + \frac{1}{2}(20+v)(4) = 18.4 \times 10</math>  <math>v = 32</math></p>	<p>P1</p> <p>K1 N1</p> <p>K1 K1</p> <p>N1</p> <p>6 marks</p>
9	<p>(a) <math>\frac{40}{360} \times 2 \times \frac{22}{7} \times 14</math> or <math>\frac{140}{360} \times 2 \times \frac{22}{7} \times 28</math>  Perimeter = <math>\frac{40}{360} \times 2 \times \frac{22}{7} \times 14 + \frac{140}{360} \times 2 \times \frac{22}{7} \times 28 + 14 + 28 + 14</math>  <math>= 134\frac{2}{9} \text{ cm}</math> @ 134.222 @ <math>\frac{1208}{9}</math></p> <p>(b) <math>\frac{40}{360} \times \frac{22}{7} \times 14^2</math> or <math>\frac{140}{360} \times \frac{22}{7} \times 28^2</math> or <math>\frac{140}{360} \times \frac{22}{7} \times 14^2</math>  Area of the shaded region  <math>= \frac{40}{360} \times \frac{22}{7} \times 14^2 + \frac{140}{360} \times \frac{22}{7} \times 28^2 - \frac{140}{360} \times \frac{22}{7} \times 14^2</math>  <math>= 787\frac{1}{9} \text{ cm}^2</math> @ 787.11 @ <math>\frac{7084}{9}</math></p>	<p>K1</p> <p>K1</p> <p>N1</p> <p>K1</p> <p>K1</p> <p>N1</p> <p>6 marks</p>
10	<p>(a) <math>9 - (-6x) = 0</math>  <math>x = -\frac{3}{2}</math> @ -1.5</p> <p>(b) <math>\begin{pmatrix} 30 &amp; 50 \\ 50 &amp; 40 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2190 \\ 2220 \end{pmatrix}</math>  <math>\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{(30)(40) - (50)(50)} \begin{pmatrix} 40 &amp; -50 \\ -50 &amp; 30 \end{pmatrix} \begin{pmatrix} 2190 \\ 2220 \end{pmatrix}</math>  <math>x = 18</math>  <math>y = 33</math>  Final answer as <math>\begin{pmatrix} 18 \\ 33 \end{pmatrix}</math>, award N1.</p>	<p>K1</p> <p>N1</p> <p>P1</p> <p>K1</p> <p>N1 N1</p> <p>6 marks</p>

11	<p>(a) (i) {(Chandra, Farah), (Chandra, Ani), (Farah, Chandra), (Farah, Ani), (Ani, Chandra), (Ani, Farah)}</p> <p>(ii) {(Chandra, Farah), (Chandra, Ani), (Farah, Chandra), (Ani, Chandra)}  <math>\frac{4}{6}</math> or <math>\frac{2}{3}</math></p> <p>(b) (i) {(Anuar, Ling), (Anuar, Susan), (Anuar, Nadia), (Anuar, Farah), (Anuar, Ani), (Tee, Ling), (Tee, Susan), (Tee, Nadia), (Tee, Farah), (Tee, Ani), (Chandra, Ling), (Chandra, Susan), (Chandra, Nadia), (Chandra, Farah), (Chandra, Ani)}</p> <p>(ii) {(Anuar, Ling), (Anuar, Susan), (Anuar, Nadia), (Tee, Ling), (Tee, Susan), (Tee, Nadia)}  <math>\frac{6}{15}</math> or <math>\frac{2}{5}</math></p>	<p>P1</p> <p>K1</p> <p>N1</p> <p>P1</p> <p>K1</p> <p>N1</p>						
6 marks								
12	<p>(a) <table border="1" style="display: inline-table; vertical-align: middle;"> <tbody> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">5</td> </tr> <tr> <td style="padding: 5px;">y</td> <td style="padding: 5px;">21</td> <td style="padding: 5px;">9</td> </tr> </tbody> </table></p> <p>(b) Axes drawn in the correct directions with uniform scales for <math>0 \leq y \leq 21</math> and <math>0 \leq x \leq 6</math>.</p> <p>All 5 points and *2 points correctly plotted.  <u>Note:</u> 5 or 6 points plotted correctly, award K1.</p> <p>Smooth and continuous curve passing through all 7 correct points using the given scale for <math>0 \leq y \leq 21</math>.</p> <p>(c) (i) <math>x = 1.5</math>  Note : Accerpt <math>1.4 &lt; x &lt; 1.6</math>  (ii) <math>y = -(1.5^*)^2 + 5(1.5^*) + 19</math>  <math>= 21.25</math></p> <p>(d) <math>0 &lt; x &lt; 5.2</math>  Note: Accept <math>0 &lt; x &lt; 5.1</math> or <math>0 &lt; x &lt; 5.3</math></p>	x	1	5	y	21	9	<p>N1 N1</p> <p>P1</p> <p>K2</p> <p>N1</p> <p>P2</p> <p>K1</p> <p>N1</p> <p>P2</p>
x	1	5						
y	21	9						



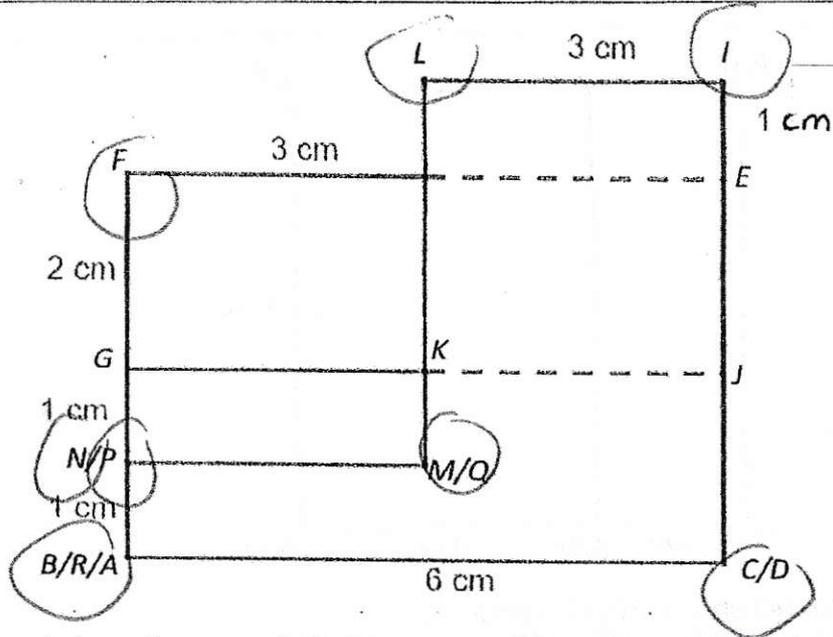
12 marks

13	<p>(a) (8,1) Note: (6,4) seen, award P1</p> <p>(b) (7,4)</p> <p>(c) <math>V =</math> Enlargement of scale factor <math>\frac{1}{3}</math> with centre A. <u>or</u> equivalent <i>(A, 6)</i> <math>V =</math> <i>Pembesaran dengan faktor skala <math>\frac{1}{3}</math> pada pusat A. atau setara</i></p> <p><math>W =</math> Rotation of <math>90^\circ</math> anticlockwise about centre (9,7). <u>or</u> equivalent <math>W =</math> <i>Putaran <math>90^\circ</math> lawan arah jam pada pusat (9,7). atau setara</i></p> <p>(d) <math>\text{Area}_{ABE} = 54 \left(\frac{1}{3}\right)^2</math> <u>or</u> <math>\text{Luas}_{ABE} = 54 \left(\frac{1}{3}\right)^2</math> <math>54 - 6 = 48</math></p>	<p>P2</p> <p>P1</p> <p>P3</p> <p>P3</p> <p>K1 K1 N1</p> <p>12 marks</p>																														
14	<table border="1" data-bbox="344 792 1259 1211"> <thead> <tr> <th>Monthly Saving (RM) <i>Simpanan (RM)</i></th> <th>Commulative frequency <i>Kekerapan longgokan</i></th> <th>Upper boundary <i>Sempadan atas</i></th> </tr> </thead> <tbody> <tr><td>60 – 69</td><td>0</td><td>69.5</td></tr> <tr><td>70 – 79</td><td>3</td><td>79.5</td></tr> <tr><td>80 – 89</td><td>8</td><td>89.5</td></tr> <tr><td>90 – 99</td><td>17</td><td>99.5</td></tr> <tr><td>100 – 109</td><td>32</td><td>109.5</td></tr> <tr><td>110 – 119</td><td>40</td><td>119.5</td></tr> <tr><td>120 – 129</td><td>46</td><td>129.5</td></tr> <tr><td>130 – 139</td><td>49</td><td>139.5</td></tr> <tr><td>140 – 149</td><td>50</td><td>149.5</td></tr> </tbody> </table> <p>(b) (i) 100 – 109</p> <p>(ii) <math>\frac{(74.5 \times 3) + (84.5 \times 5) + (94.5 \times 9) + (104.5 \times 15) + (114.5 \times 8) + (124.5 \times 6) + (134.5 \times 3) + (144.5 \times 1)}{(3+5+9+15+8+6+3+1)}</math> <math>\frac{5275}{50}</math></p> <p>Note: 1. Allow two mistakes in *frequency for K1. 2. Allow two mistakes for the multiplication of *frequency and midpoint for K1.</p> <p>(c) <u>Ogive:</u> Axes drawn in the correct directions with uniform scales for <math>69.5 \leq x \leq 149.5</math> and <math>0 \leq y \leq 50</math>.</p> <p>*8 points plotted correctly using correct values of upper boundary. Note: *6 or *7 points plotted correctly, award K1.</p> <p>Smoothness of the graph using the given scales.</p> <p>(d) 66</p>	Monthly Saving (RM) <i>Simpanan (RM)</i>	Commulative frequency <i>Kekerapan longgokan</i>	Upper boundary <i>Sempadan atas</i>	60 – 69	0	69.5	70 – 79	3	79.5	80 – 89	8	89.5	90 – 99	17	99.5	100 – 109	32	109.5	110 – 119	40	119.5	120 – 129	46	129.5	130 – 139	49	139.5	140 – 149	50	149.5	<p>P1 P1 P1</p> <p>P1</p> <p>K2 N1</p> <p>P1</p> <p>K2</p> <p>N1</p> <p>N1</p>
Monthly Saving (RM) <i>Simpanan (RM)</i>	Commulative frequency <i>Kekerapan longgokan</i>	Upper boundary <i>Sempadan atas</i>																														
60 – 69	0	69.5																														
70 – 79	3	79.5																														
80 – 89	8	89.5																														
90 – 99	17	99.5																														
100 – 109	32	109.5																														
110 – 119	40	119.5																														
120 – 129	46	129.5																														
130 – 139	49	139.5																														
140 – 149	50	149.5																														



12 marks

(ii)



Correct shape hexagon  $BCILKG$  and rectangle  $GNMK$ .

Note : Ignore dotted lines.

Incur two dotted lines as shown in the diagram for hexagon  $BCILKG$ .

$BC > CI > AF = LM > LI > BN = PG$ .

Correct measurement  $\pm 0.2$  cm (one way) and all angles at the vertices =  $90^\circ \pm 1^\circ$ .

K1

K1

K1

N2

12 marks

16

(a) (i)  $P(0^\circ, 75^\circ E/T)$ (ii)  $105^\circ W/B$ (b)  $(180^\circ - 20^\circ - 20^\circ) \times 60$  or  $(140^\circ \times 60)$   
8400(c)  $(20^\circ \times 60)$  $180^\circ \times 60 \times \cos 20^\circ$ Note :Using  $\cos 20^\circ$  correctly, award K1 $(20^\circ \times 60) + (180^\circ \times 60 \times \cos 20^\circ)$   
11349(d)  $\frac{*11349}{18}$ 18  
630.5

P1 P1

P1

K1

N1

K1

K2

K1

N1

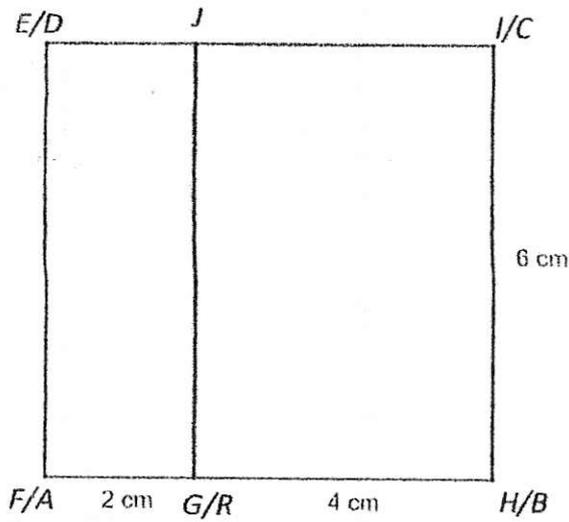
K1

N1

12 marks

15

(a)



Correct shape with all solid lines.

$$EF = FH = GJ > HG > GF$$

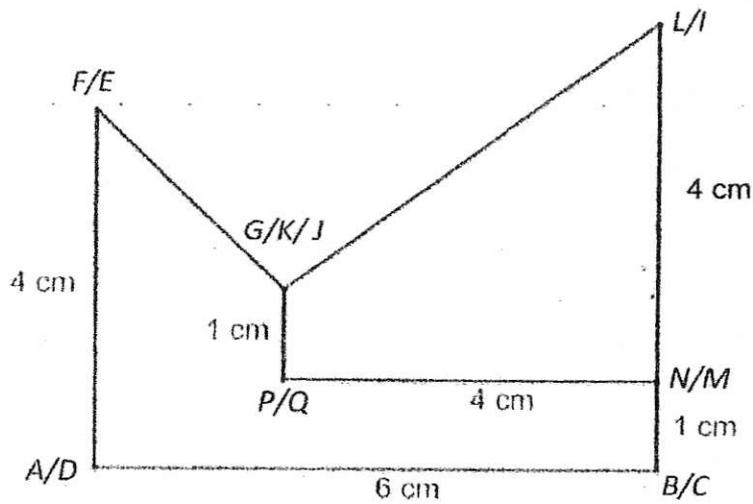
Correct measurement  $\pm 0.2$  cm (one way) and all angles at the vertices =  $90^\circ \pm 1^\circ$ .

K1

K1

N1

(b) (i)



Correct shape with all solid lines.

$$AB > BL > ML = MP = AE > PG$$

Correct measurement  $\pm 0.2$  cm (one way) and all angles at the vertices =  $90^\circ \pm 1^\circ$ .

K1

K1

N2