

**1449/2 (PP)  
Matematik  
Kertas 2  
Peraturan  
Pemarkahan  
17 Sept  
2008**

**PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA  
SEKOLAH MENENGAH  
NEGERI KEDAH DARUL AMAN.**

**PEPERIKSAAN PERCUBAAN SPM 2008**

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**MATHEMATICS**

Kertas 2

**PERATURAN PEMARKAHAN**

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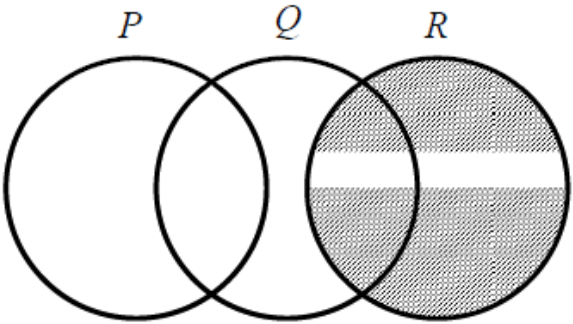
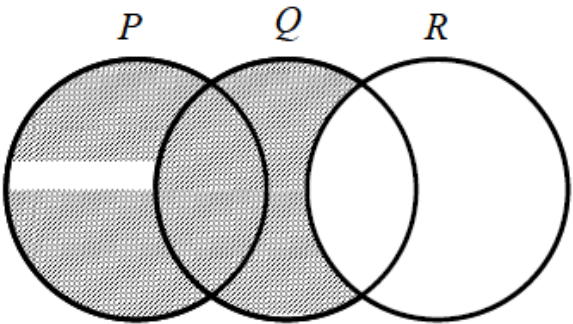
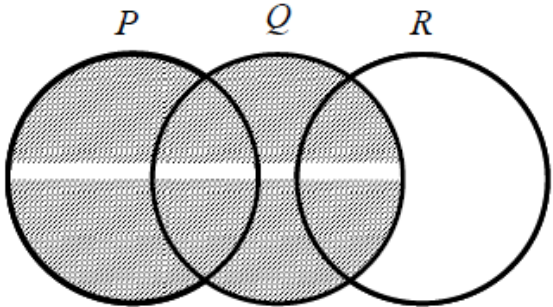
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Peraturan pemarkahan ini mengandungi 17 halaman bercetak

Question	Solution and Mark Scheme	Marks
1(a)		K1
(b)	 <p><u>Note:</u></p>  <p>Set <math>P \cup Q</math> correctly shaded, award K1</p>	K2
		3



Question	Solution and Mark Scheme	Marks	
2	$3p - q = 21$ <u>or</u> $2p - \frac{2}{3}q = 14$ <u>or</u> equivalent	K1	
	$5p = 25$ <u>or</u> $-\frac{5}{3}q = 10$ <u>or</u> equivalent	K1	
	<b>OR</b>		
	$p = \frac{4-q}{2}$ <u>or</u> $q = 4 - 2p$ <u>or</u> equivalent (K1)		
	$5p = 25$ <u>or</u> $-\frac{5}{3}q = 10$ <u>or</u> equivalent (K1)		
	<b>OR</b>		
	$\begin{pmatrix} p \\ q \end{pmatrix} = \frac{1}{1(1) - \left(-\frac{1}{3}\right)(2)} \begin{pmatrix} 1 & \frac{1}{3} \\ -2 & 1 \end{pmatrix} \begin{pmatrix} 7 \\ 4 \end{pmatrix}$ <u>or</u> equivalent (K2)		
	$p = 5$	N1	
	$q = -6$	N1	4
	<b>Note :</b> Accept		
	1. $\begin{pmatrix} p \\ q \end{pmatrix} = \begin{pmatrix} 5 \\ -6 \end{pmatrix}$ as final answer, award N1		
	2. $\frac{1}{1(1) - \left(-\frac{1}{3}\right)(2)} \begin{pmatrix} 1 & \frac{1}{3} \\ -2 & 1 \end{pmatrix}$ <u>or</u> equivalent seen, award (K1)		

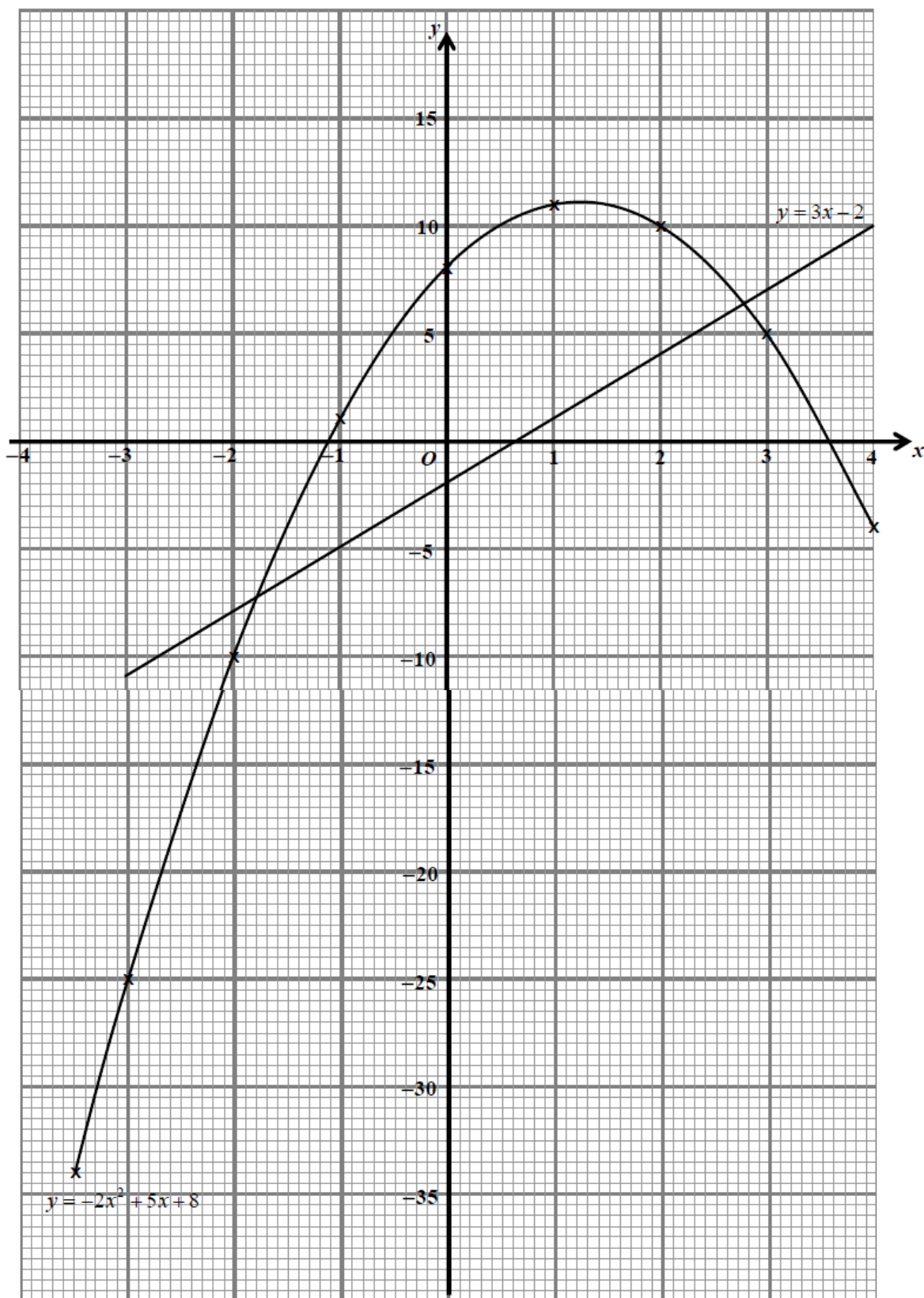
Question	Solution and Mark Scheme	Marks	
3	$3x^2 + x - 10 = 0$ $(3x - 5)(x + 2) = 0$ <u>or</u> equivalent $x = -2$ $x = \frac{5}{3}$ <u>or</u> 1.67 <u>Note</u> : 1. Accept without '= 0' 2. Accept three terms on the same side, in any order. 3. Do not accept solutions solved not using factorisation. 4. Accept $\left(x - \frac{5}{3}\right)(x + 2) = 0$ , with $x = \frac{5}{3}, -2$ for KK2	K1  K1 N1  N1	4
4	Identify $\angle UPT$ <u>or</u> $\angle TPU$ $\tan \angle UPT = \frac{7}{\sqrt{5^2 - 4^2}}$ <u>or</u> equivalent $66.8^\circ$ <u>or</u> $66^\circ 48'$	P1  K1  N1	3
5(a)  (b)	$y = \frac{3}{2}$ Gradient $SR = 4$ $\frac{y - (-6)}{x - 1} = 4$ <u>or</u> $-6 = 4(1) + c$ <u>or</u> equivalent $y = 4x - 10$ <u>or</u> equivalent -10	N1  P1  K1  N1  N1	5

Question	Solution and Mark Scheme	Marks	
6(a)	Non-statement	P1	4
(b)	Implication 1 : If $x - p > y - p$ , then $x > y$	K1	
	Implication 2 : If $x > y$ , then $x - p > y - p$	K1	
(c)	If $k$ is a multiple of 9, then it is multiple of 3 True	P1 dep P1	
(d)	Premise 2 : 384 is divisible by 12  <u>or</u> 384 boleh dibahagi tepat dengan 12	K1	
7(a)	$\frac{90}{360} \times 2 \times \frac{22}{7} \times 14$ <u>or</u> $\frac{60}{360} \times 2 \times \frac{22}{7} \times 7$	K1	6
	$14 + \frac{90}{360} \times 2 \times \frac{22}{7} \times 14 + \frac{60}{360} \times 2 \times \frac{22}{7} \times 7 + 7 + 7$	K1	
	$\frac{172}{3}$ <u>or</u> $57\frac{1}{3}$ <u>or</u> $57.33$	N1	
(b)	$\frac{90}{360} \times \frac{22}{7} \times 14^2$ <u>or</u> $\frac{180}{360} \times \frac{22}{7} \times 7^2$ <u>or</u> $\frac{60}{360} \times \frac{22}{7} \times 7^2$	K1	
	$\frac{90}{360} \times \frac{22}{7} \times 14^2 - \frac{180}{360} \times \frac{22}{7} \times 7^2 + \frac{60}{360} \times \frac{22}{7} \times 7^2$	K1	
	$\frac{308}{3}$ <u>or</u> $102\frac{2}{3}$ <u>or</u> $102.67$	N1	
	<u>Note :</u>  1. Accept $\pi$ for K mark. 2. Correct answer from incomplete working, award KK2.		

Question	Solution and Mark Scheme	Marks	
8(a)	$\frac{1}{3} \times \frac{2}{5}$	K1	
	$\frac{2}{15}$	N1	
(b)	$\left(\frac{1}{3} \times \frac{2}{5}\right) + \left(\frac{1}{3} \times \frac{2}{5}\right) + \left(\frac{1}{3} \times \frac{5}{8}\right)$	K2	
	<u>Note</u> : $\frac{1}{3} \times \frac{2}{5}$ <u>or</u> $\frac{1}{3} \times \frac{3}{5}$ <u>or</u> $\frac{1}{3} \times \frac{5}{8}$ , award K1 (with condition of <b>not</b> more than 3 pairs)		
	$\frac{195}{360}$ <u>or</u> $\frac{65}{120}$ <u>or</u> $\frac{13}{24}$ <u>or</u> 0.5417	N1	5
9(a)	$k = 10$	P1	
	$p = -3$	P1	
(b)	$\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{(4)(1) - (-2)(3)} \begin{pmatrix} 4 & 2 \\ -3 & 1 \end{pmatrix} \begin{pmatrix} 4 \\ 2 \end{pmatrix}$	K2	
	$x = 2$	N1	
	$y = -1$	N1	6
	<u>Note</u> : 1. $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} \text{inverse} \\ \text{matrix} \end{pmatrix} \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ <u>or</u> $\frac{1}{(4)(1) - (-2)(3)} \begin{pmatrix} 4 & 2 \\ -3 & 1 \end{pmatrix}$ seen, award K1 2. Do not accept $\begin{pmatrix} \text{inverse} \\ \text{matrix} \end{pmatrix} = \begin{pmatrix} 1 & -2 \\ 3 & 4 \end{pmatrix}$ <u>or</u> $\begin{pmatrix} \text{inverse} \\ \text{matrix} \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ . 3. $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$ as final answer, award N1. 4. Do not accept any solution solved not using matrices.		

Question	Solution and Mark Scheme	Marks	
10(a)	9	P1	6
(b)	$\frac{9-3}{5-0}$ or $\frac{3-9}{0-5}$	K1	
	$\frac{6}{5}$ or $1\frac{1}{5}$ or $1.2$	N1	
	<u>Note:</u> Without working, award K1N1		
(c)	$\frac{1}{2} \times (3+9) \times 5 + (t-5) \times 9 + \frac{1}{2} \times (9+21)(16-t) = 153$ or equivalent	K2	6
	12	N1	
	<u>Note :</u> Allow one mistake in distance expression for any two <u>or</u> one correct areas for K1.		
11	$40 \times 7$	K1	4
	$\frac{1}{3} \times \frac{22}{7} \times 3 \times 3 \times 5$	K1	
	$40 \times 7 - \frac{1}{3} \times \frac{22}{7} \times 3 \times 3 \times 5$	K1	
	$232.8 - 232.9$	N1	
	<u>Note:</u> 1. Accept $\pi$ for K mark 2. Correct answer from incomplete working, award KK2		

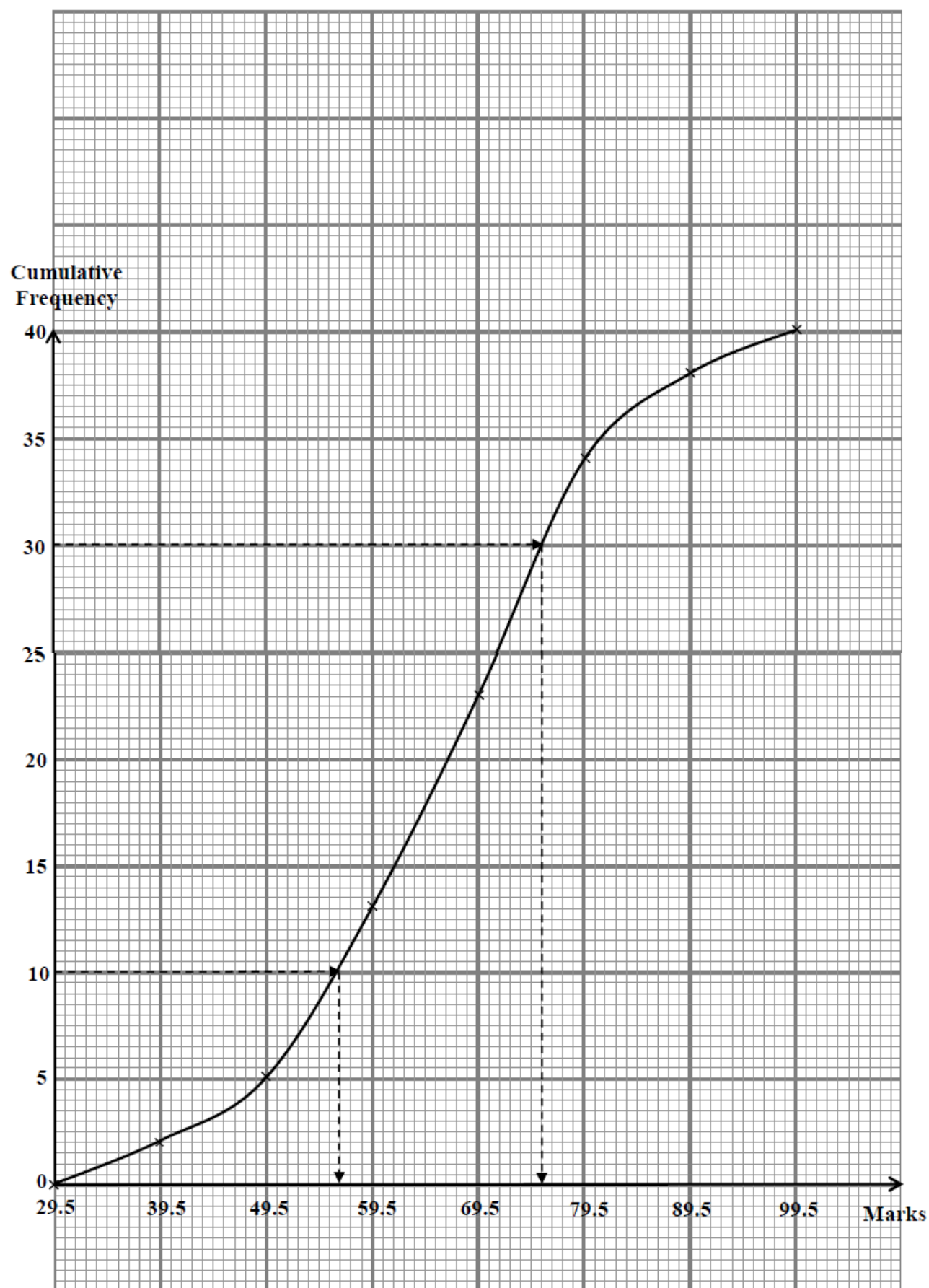
Question	Solution and Mark Scheme	Marks	
12(a)	-10 5	K1 K1	2
	<u>Note</u> : <b>K</b> only meant for table value		
(b)	<u>Graph</u>  Axes drawn in correct direction, uniform scales in $-3.5 \leq x \leq 4$ and $-34 \leq y \leq 11$  7 points and *2 points correctly plotted <u>or</u> curve passes through these points for $-3.5 \leq x \leq 4$  Smooth and continuous curve without any straight line and passes through all 9 correct points using the given scales for $-3.5 \leq x \leq 4$  <u>Note</u> : 1. 7 or 8 points correctly plotted, award K1 2. Ignore curve out of range	P1  K2 (does not depend on P)  N1 (depends on P and K)	4
(c)(i)	$2.5 \leq y \leq 2.7$	P1	2
(ii)	$-2.45 \leq x \leq -2.40$	P1	
(d)	Identify equation $y = 3x - 2$ <u>or</u> equivalent  Straight line $y = 3x - 2$ correctly drawn  <u>Values of x</u> : $-1.8 \leq x \leq -1.7$ $2.7 \leq x \leq 2.8$ } Values of x on the graph must correct	K1  K1  N1 (dep 2 <sup>nd</sup> K1) N1 (dep 2 <sup>nd</sup> K1)	4
	<u>Note</u> : 1. Allow <b>P</b> mark or <b>N</b> mark if values of y and x shown on graph 2. Values of y and x obtained by computations, award <b>P0</b> or <b>N0</b> ( $> 2$ decimal places)		





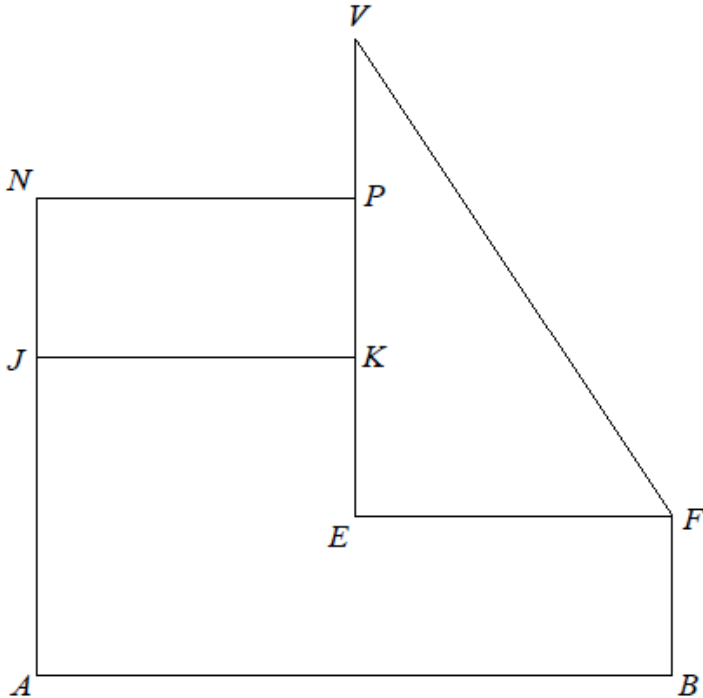
Question	Solution and Mark Scheme	Marks	
13(a)(i)	(5, 4)	P1	
(ii)	(5, -2)	P2	3
	<u>Note</u> : (1, 0) or (5, -2) marked on diagram, award P1		
(b)(i)	<b>W</b> : Rotation $90^\circ$ anticlockwise at centre $(-1, 2)$ <u>or</u> equivalent. <u>Note</u> : 1. P2: Rotation $90^\circ$ anticlockwise <u>or</u> Rotation at centre $(-1, 2)$ , 2. P1: Rotation.	P3	
(ii)	<b>V</b> : Enlargement centre $(-5, 5)$ with scale factor 3 <u>Note</u> : 1. P2: Enlargement centre $(-5, 5)$ <u>or</u> Enlargement scale factor 3. 2. P1: Enlargement.	P3	6
(c)	$\frac{198}{* (3)^2}$	K1	
	$198 - \frac{198}{* (3)^2}$ <u>or</u> $198 - 22$	K1	
	176	N1	3
	<b>OR</b> $\frac{198}{18} \times 16$ <b>OR</b> $8\left(\frac{198}{9}\right)$ <u>or</u> $8\left(\frac{198}{3^2}\right)$ , award K2		

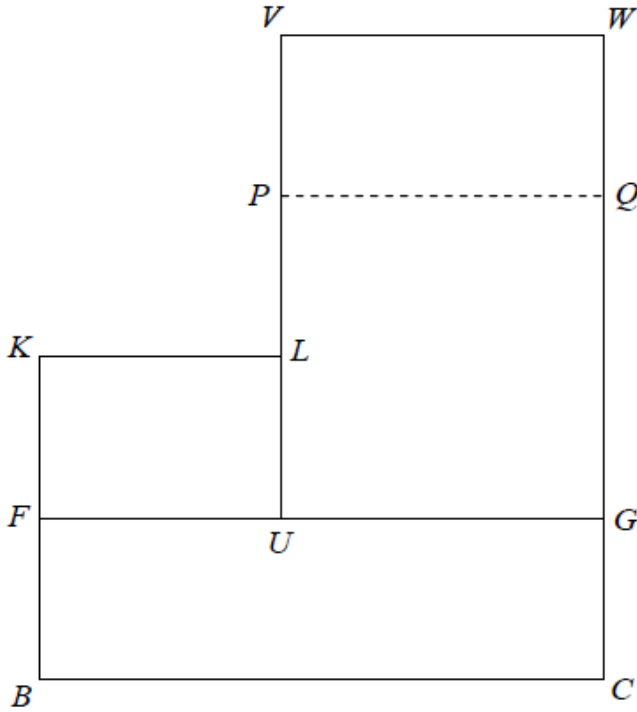
Question	Solution and Mark Scheme				Marks	
14(a)	(i)	<b>Upper Boundary</b> <i>Sempadan Atas</i>	<b>Frequency</b> <i>Kekerapan</i>	<b>Cumulative Frequency</b> <i>Kekerapan Longgokan</i>		
		29.5	0	0	I	
		39.5	2	2	II	
		49.5	3	5	III	
		59.5	8	13	IV	
		69.5	10	23	V	
		79.5	11	34	VI	
		89.5	4	38	VII	
		99.5	2	40	VIII	
		Upper boundary : (II to VIII)			P1	
		Frequency : (II to VIII)			P2	
		Cumulative frequency : (II to VIII)			P1	
(b)	(ii)	<u>Note :</u> Allow one mistake in frequency for P1				
		74.5			P1	5
		Axes drawn in correct direction and uniform scale for $29.5 \leq x \leq 99.5$ and $0 \leq y \leq 40$			P1	
		*8 points correctly plotted			K2	
		<u>Note :</u> *6 or *7 points correctly plotted <u>or</u> curve passes through using at least 6 correct upper boundary, award K1				
		Smooth and continuous curve without any straight line passes all 8 correct points for using given scales $29.5 \leq x \leq 99.5$			N1	4
		First Quartile = $56.0 \pm 0.5$ <u>or</u> Third Quartile = $75.5 \pm 0.5$			K1	
		Interquartile range = $75.5^* - 56.0^*$			K1	
		$= 19.5 \pm 0.5$			N1	3
						12



Question	Solution and Mark Scheme	Marks
15	<p><u>Note :</u></p> <ol style="list-style-type: none"> <li>(1) Accept drawing only (not sketch).</li> <li>(2) Accept diagrams with wrong labels or without labels.</li> <li>(3) Accept correct rotation of diagrams.</li> <li>(4) Lateral inversions are not accepted.</li> <li>(5) If more than 3 diagrams are drawn, award mark to the correct ones only.</li> <li>(6) For extra lines (dotted or solid) except construction lines, no mark is awarded.</li> <li>(7) If other scales are used with accuracy of <math>\pm 0.2</math> cm one way, deduct 1 mark from the N mark obtained, for each part attempted.</li> <li>(8) Accept small gaps extensions at the corners. For each part attempted :               <ol style="list-style-type: none"> <li>(i) If <math>\leq 0.4</math> cm, deduct 1 mark from the N mark obtained.</li> <li>(ii) If <math>&gt; 0.4</math> cm, no N mark is awarded.</li> </ol> </li> <li>(9) If the construction lines cannot be differentiated from the actual lines:               <ol style="list-style-type: none"> <li>(i) Dotted line : If outside the diagram, award the N mark. If inside the diagram, award N0.</li> <li>(ii) Solid line : If outside the diagram, award N0. If inside the diagram, no mark is awarded.</li> </ol> </li> <li>(10) For double lines or non-collinear or bold lines, deduct 1 mark from the N mark obtained, for each part attempted.</li> </ol>	

Question	Solution and Mark Scheme	Marks	
15(a)	<div data-bbox="418 283 1153 934" data-label="Image"> </div> <p data-bbox="337 961 1015 1077">Correct shape with rectangles <math>JFGR</math> , <math>JKPN</math> and square <math>NPQR</math> All solid lines.</p> <p data-bbox="337 1098 824 1136"><math>JF &gt; FG &gt; GQ = QR = RN &gt; NJ</math></p> <p data-bbox="337 1262 1166 1346">Measurement correct to <math>\pm 0.2</math> cm (one way) and all angles at vertices of rectangles = <math>90^\circ \pm 1^\circ</math></p>	K1	
		K1 dep K1	
		N1 dep K1K1	3

Question	Solution and Mark Scheme	Marks	
15(b)	<div></div> <p>Correct shape with the triangle <math>FEV</math>, rectangle <math>JKPN</math> and hexagon <math>ABFEKJ</math> All solid lines</p> <p><math>AB &gt; EV &gt; EF = JA = NP &gt; BF = NJ = VP</math></p> <p>Measurement correct to <math>\pm 0.2</math> cm (one way) and all angles at the vertices of rectangles = <math>90^\circ \pm 1^\circ</math></p>	K1  K1 dep K1  N2 dep K1K1	4

Question	Solution and Mark Scheme	Marks	
15(c)			
	<p>Correct shape with rectangles <math>BCGF</math>, <math>GWVU</math> and <math>FULK</math> All solid lines</p> <p><u>Note</u> : Ignore <math>PQ</math></p> <p><math>P</math> and <math>Q</math> joined with dotted line to form square <math>PQGU</math> or rectangle <math>PQWW</math></p> <p><math>CW &gt; BC &gt; VL &gt; VW = BK &gt; KL &gt; UL = LP = PV = BF = FK</math></p> <p>Measurement correct to <math>\pm 0.2</math> cm (one way) and all angles at the vertices of rectangles = <math>90^\circ \pm 1^\circ</math></p>	<p>K1</p> <p>K1 dep K1</p> <p>K1 dep K1K1</p> <p>N2 dep K1K1K1</p>	<p>5</p>



Question	Solution and Mark Scheme	Marks	
16(a)	$(36^{\circ}N, 70^{\circ}W)$ <u>Note:</u> $70^{\circ}W$ <u>or</u> $(65^{\circ}N, \theta^{\circ}W / 70^{\circ}E)$ , award P2 $36^{\circ}N$ <u>or</u> $(180 - 110)$ , award P1	P3	3
(b)(i)	$(50 + 36) \times 60$ <u>or</u> equivalent 5160	K1 N1	5
(ii)	$140 \times 60 \times \cos 50$ <u>or</u> equivalent 5399.42	K2 N1	
(c)	<u>Note</u> : Usage of $\cos 50$ <u>or</u> $(30 + 110)$ , award K1 $180 \times 60 \times \cos 36$ <u>or</u> 8737.38 <u>Note</u> : Usage of $\cos 36$ <u>or</u> $(70 + 110)$ , award K1 $\frac{(180 \times 60 \times \cos 36)^*}{800}$	K2  K1	
	$10.92$ <u>or</u> 10 hours 55 minutes	N1	4
END OF MARK SCHEME			