

SKEMA JAWAPAN KERTAS 1 MATEMATIK TINGKATAN 5

PEPERIKSAAN SPMRSM 2022

JAWAPAN / ANSWER

1	D
2	A
3	C
4	A
5	D
6	B
7	B
8	C
9	A
10	C
11	D
12	D
13	B
14	C
15	B
16	C
17	B
18	C
19	A
20	C

21	B
22	C
23	A
24	D
25	A
26	B
27	B
28	B
29	A
30	B
31	D
32	C
33	C
34	A
35	D
36	B
37	D
38	A
39	C
40	D

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SKEMA JAWAPAN KERTAS 2 MATEMATIK TINGKATAN 5

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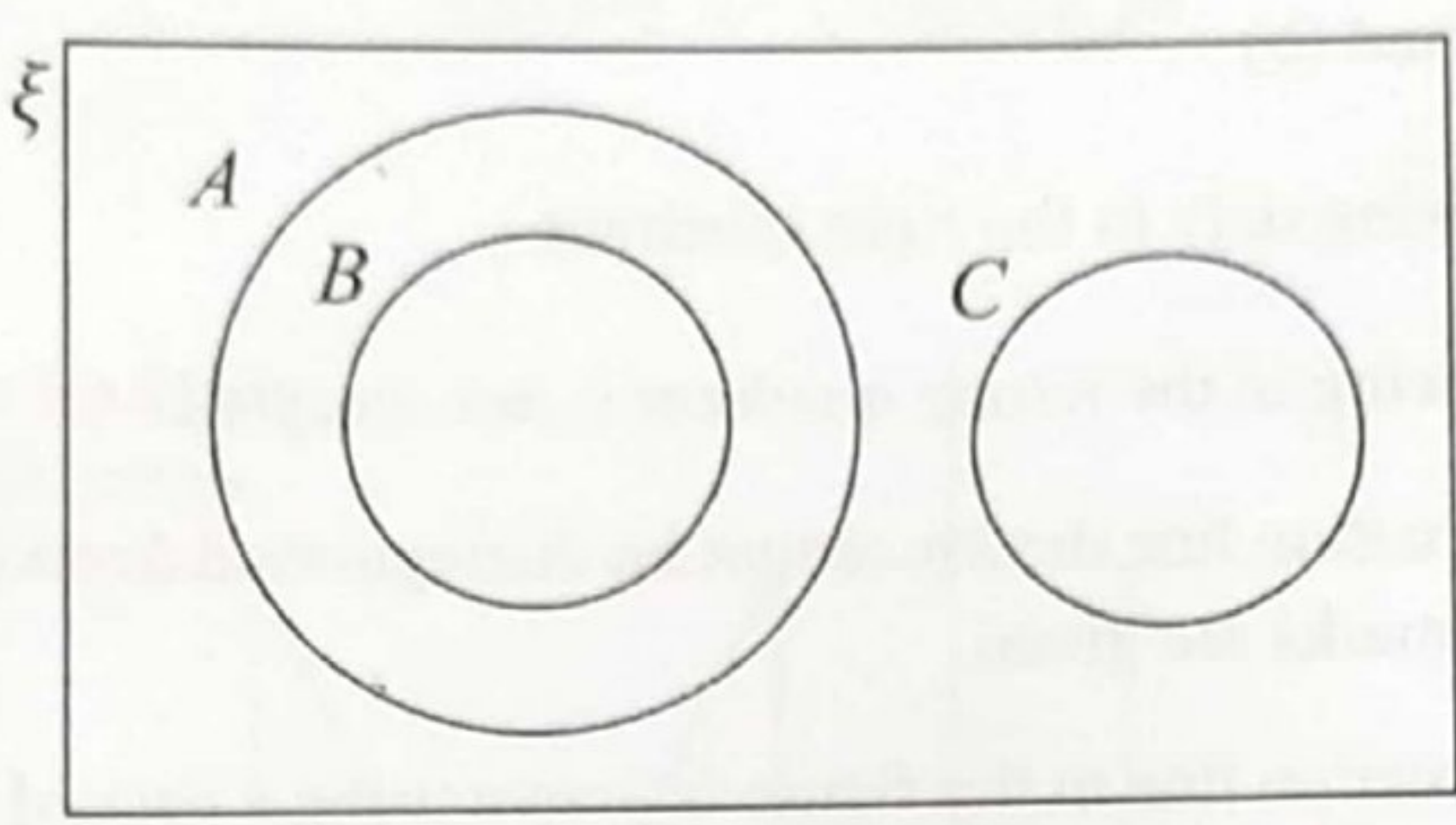
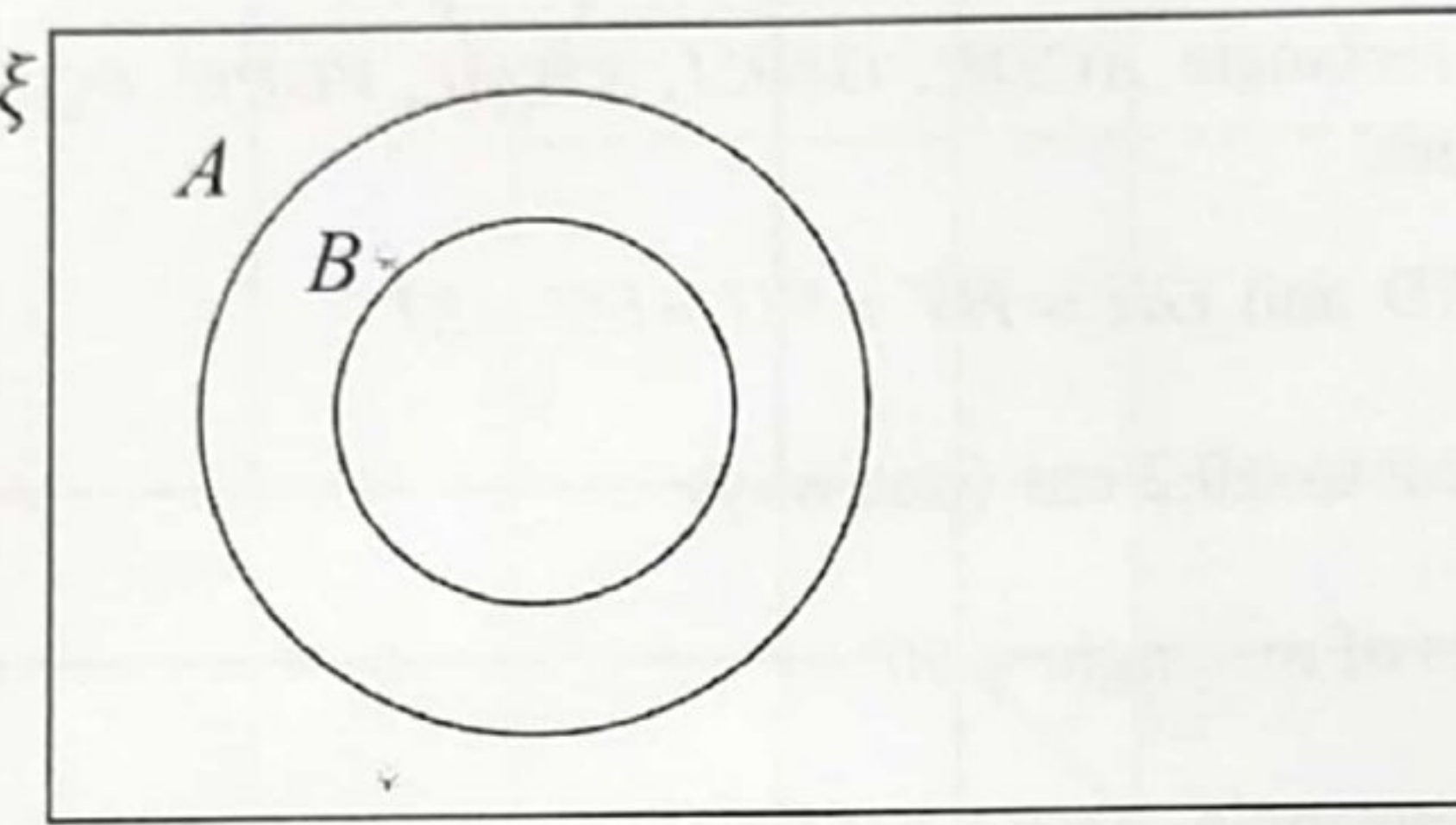
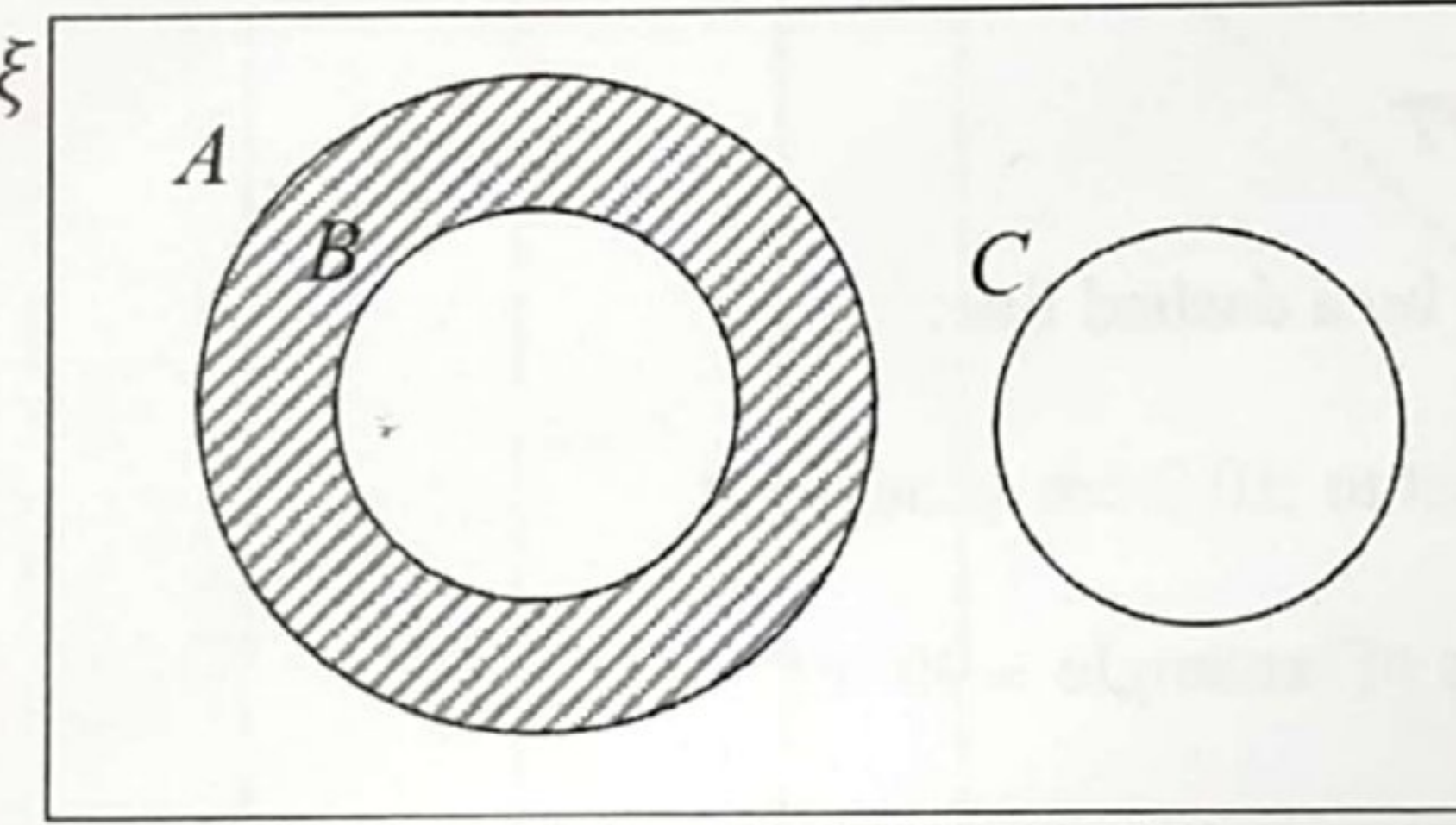
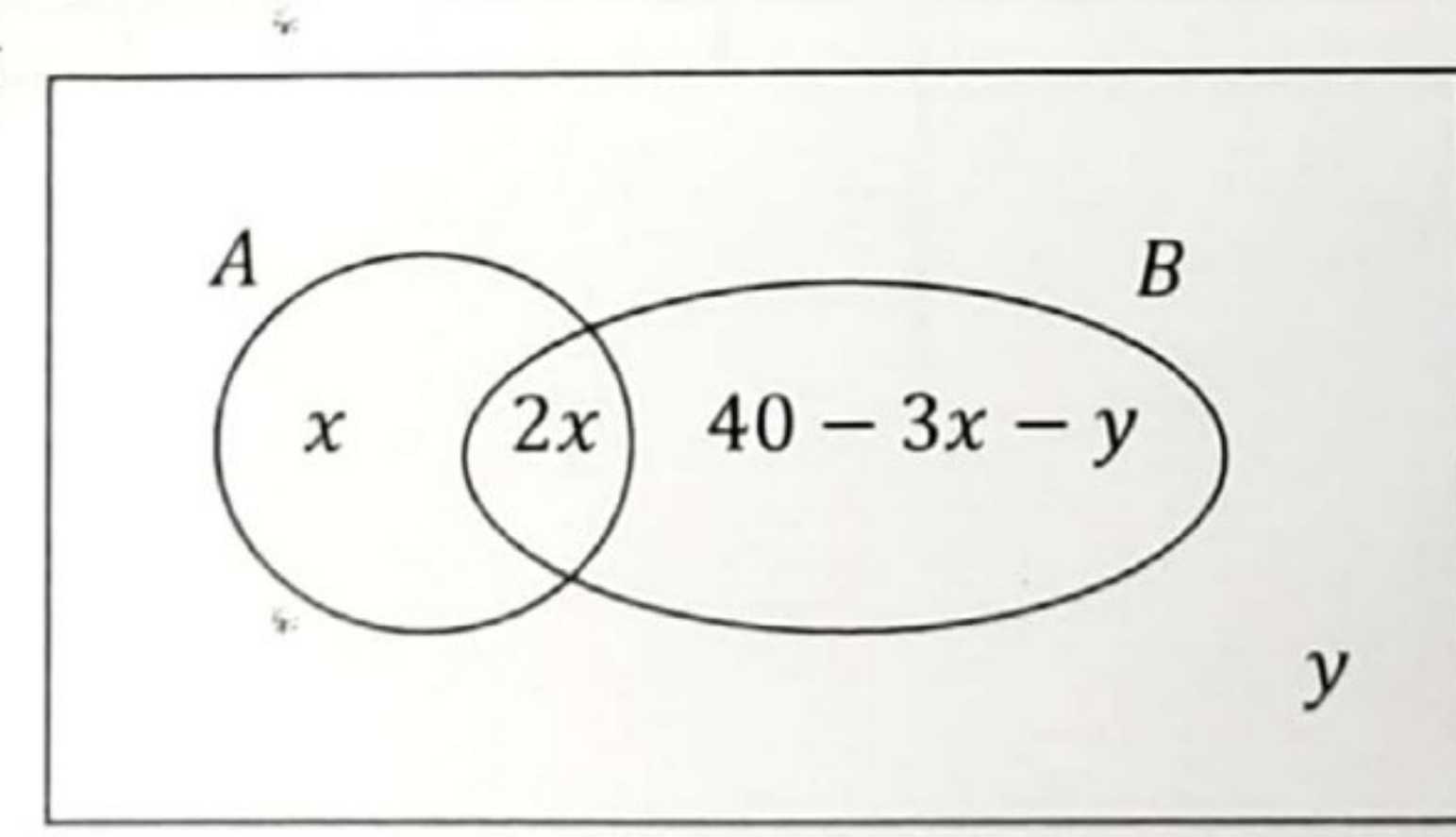
SECTION A [40 MARKS]			
NO	Solution and Marking Schemes	Sub Marks	Total
1	$y = \frac{3}{2}x + 2$ $m_1 = \frac{3}{2}$ $m_2 = \frac{7-1}{1-(-3)} = \frac{3}{2}$ Since $m_1 = m_2$, therefore the two straight lines are parallel.	- P1 K1 N1	3
2	(a) If $24 \div 6 = 4$, then $6 - 24 \div 6 = 2$ (b) $n(n+1)^3 + 1$, where $n = 0, 1, 2, 3, \dots$ <u>OR</u> $(n-1)n^3 + 1$, where $n = 1, 2, 3, 4, \dots$ <u>Note:</u> If $n(n+1)^3 + 1$ or $(n-1)n^3 + 1$ seen, award K1	P1 K1N1 -	3
3	(a) (i) $p = 22.5^\circ$ (ii) $q = 4$ (iii) $r = 3$ (b) $\tan \theta = -\frac{15}{8}$ $\sin \theta = -\frac{15}{17}$	P1 P1 P1 P1 P1	5
4	Smallest 3-digit number in base five 100_5 seen Largest 3-digit number in base five $= 444_5$ seen <u>Note:</u> Smallest and largest must be stated $*444_5 - *100_5 = 334_5$	P1 P1 K1	5

	344_5 $= (3 \times 5^2) + (4 \times 5^1) + (4 \times 5^0)$ $= 75 + 20 + 4$ $= 99_{10}$		
	6 6 6 6 99 16 2 0 Remainder 3 4 2	K1	
	243 ₆	N1	
5	(a) $3 = \frac{k}{2^2}$ <u>or</u> equivalent OR $3 \times 2^2 = y \times 3^2$ <u>or</u> equivalent $y = \frac{4}{3}$ (b) $450 = \frac{k(25)}{50 \times 80}$ <u>or</u> equivalent $3360 = \frac{*72\,000(n)}{20 \times 60}$ Note: If $\frac{450(50 \times 80)}{25} = \frac{3360(20 \times 60)}{n}$ (ratio method) shown, award K2 $n = 56$	K1 N1 K1 K1 - N1	5
6	(a) $4(1) - m(1)^2 + 8 - 3m = 0$ $m = 3$ (b) $-3x^2 + 4x - 1 = 0$ <u>or</u> $3x^2 - 4x + 1 = 0$ $(x-1)(-3x+1) = 0$ <u>or</u> $(-x+1)(3x-1) = 0$ for $-3x^2 + 4x - 1 = 0$ OR $(3x-1)(x-1) = 0$ for $3x^2 - 4x + 1 = 0$ <u>Note:</u> If the factorization doesn't match with the original function, give K0. $x = \frac{1}{3}$	K1 N1 K1 K1 N1	5

7	(a) $\frac{400000}{1000} \times w = 1200$ $w = 3.00$ (b) The probability of a smoker being exposed to illness is higher than that of a non-smoker who lives a healthy lifestyle. <u>Note:</u> Accept any relevant and logical answer	K1 N1 N1	3
8	(a) $V = \left(\frac{1}{2} \times \frac{4}{3} \pi x^3 \right) + \left(\frac{1}{3} \pi x^3 \times 5 \right)$ $V = \frac{7}{3} \pi x^3$ shown (b) $\frac{7}{3} \times \frac{22}{7} \times x^3 = 2515 \frac{1}{3}$ $x = 7$	K1 N1 K1 N1	4
9	(a) A pair of parallel lines (b) (i) Locus for a. drawn precisely: parallel line 1.5 cm from line BC Locus for b. drawn precisely: arc of a circle radius 5 cm from centre B (ii) The intersection between locus a. and locus b. are marked with ⊗	P1 K1 K1 N1	4

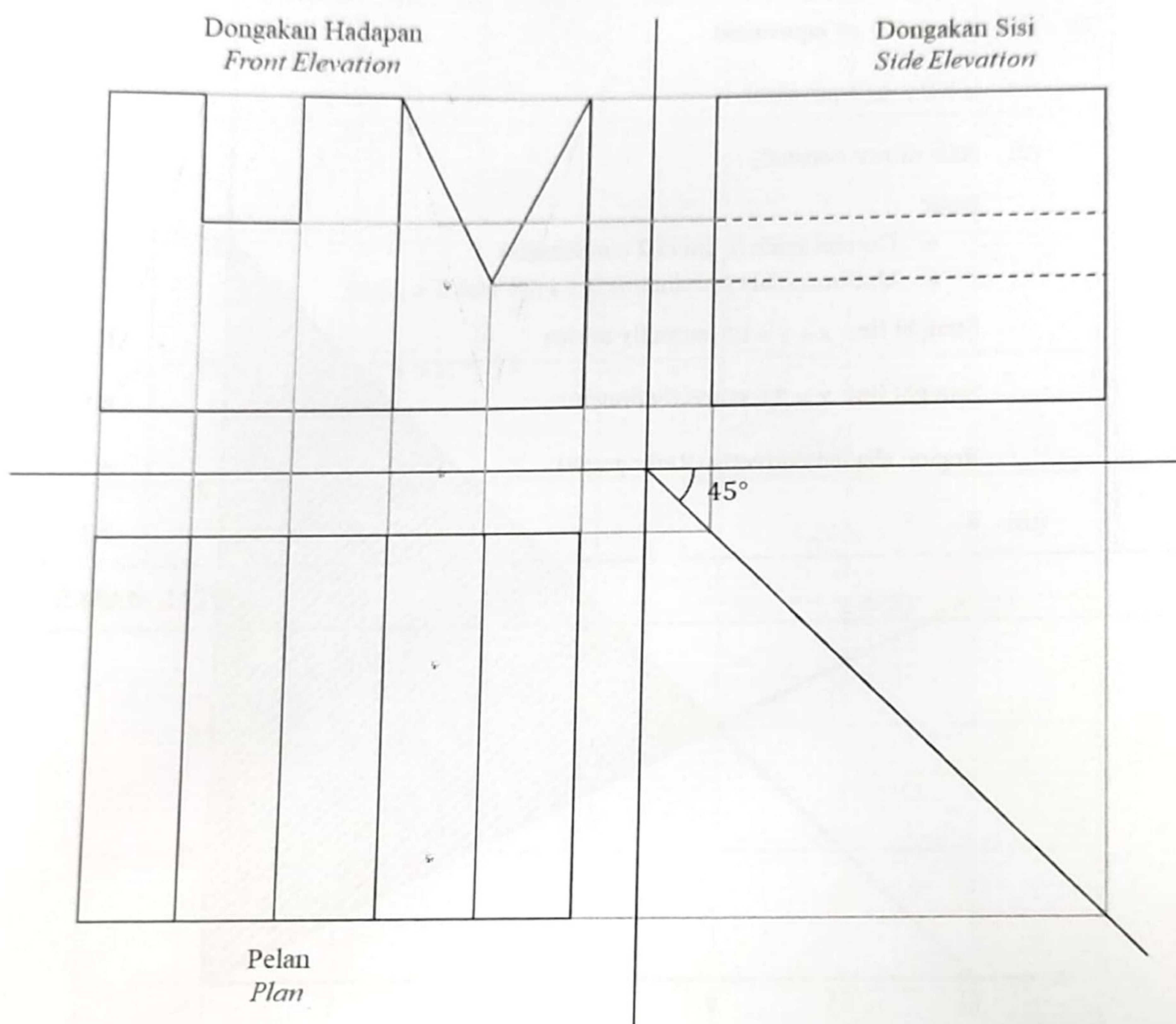
10	$\frac{2\left(\frac{22}{7}\right)(12)}{4} \text{ or } QS = \sqrt{12^2 + 9^2} \text{ seen}$ $18.86 + 15 + 3$ $36.86 \text{ or } 36\frac{6}{7} \text{ or } \frac{258}{7}$	K1 K1 N1	3
TOTAL MARKS			40
SECTION B [45 MARKS]			
NO	Solution and Marking Schemes	Sub Marks	Total
11	(a) $\begin{pmatrix} 7 & 6 \\ 0 & 13 \end{pmatrix} - \begin{pmatrix} 1 & 9 \\ -9 & 1 \end{pmatrix} \text{ or } \frac{1}{3} \begin{pmatrix} 6 & -3 \\ 9 & 12 \end{pmatrix} \text{ seen}$ $\begin{pmatrix} 2 & -1 \\ 3 & 4 \end{pmatrix}$ (b) $3(-3) - 2(-4) = -1 \neq 0$ shown (c) Let x = number of brand P facial cleanser y = number of brand Q facial cleanser $x = 3y \text{ or } x - 3y = 0 \text{ or } 45x + 79y = 642 \text{ seen}$ $\begin{pmatrix} 1 & -3 \\ 45 & 79 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 0 \\ 642 \end{pmatrix} \text{ or } \begin{pmatrix} 45 & 79 \\ 1 & -3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 642 \\ 0 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{1(79) - (-3)(45)} \begin{pmatrix} 79 & 3 \\ -45 & 1 \end{pmatrix} \begin{pmatrix} 0 \\ 642 \end{pmatrix} \text{ or } \frac{1}{45(-3) - 79(1)} \begin{pmatrix} -3 & -79 \\ -1 & 45 \end{pmatrix} \begin{pmatrix} 642 \\ 0 \end{pmatrix}$ $x = 9 \text{ or Number of brand } P \text{ facial cleanser} = 9$ $y = 3 \text{ or Number of brand } Q \text{ facial cleanser} = 3$ <u>Note:</u> - If the answer is left as $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 9 \\ 3 \end{pmatrix}$, award N1 - Do not accept any solution solved not using matrix method.	K1 N1 N1 P1 P1 K1 N1 N1	8
12	(a) Reflection	P1	10

12	(b) (i) S = Rotation 90° clockwise at centre J // (3, -1) <u>Note:</u> • Rotation 90° clockwise, award P2 • Rotation at centre J // (3, -1), award P2 • Rotation, award P1 <u>OR</u> S = Enlargement with scale factor of 2 at point (3, 1) <u>Note:</u> • Enlargement with scale factor of 2, award P2 • Enlargement at point (3, 1), award P2 • Enlargement, award P1 <u>OR</u> equivalent	P3
	(ii) R = Enlargement with scale factor of 2 at point B // (7, -1) <u>Note:</u> • Enlargement with scale factor of 2, award P2 • Enlargement at point B // (7, -1), award P2 • Enlargement, award P1 <u>OR</u> R = Rotation 90° clockwise at centre (2, 0) <u>Note:</u> • Rotation 90° clockwise, award P2 • Rotation clockwise at centre (2, 0), award P2 • Rotation, award P1 <u>OR</u> equivalent	P3
	(c) Area of image – Area of object = 210 <u>or</u> Area of image = $2^2 \times$ Area of object $(2^2 \times \text{Area of object}) - \text{Area of object} = 210$ <u>or</u> $210 + \text{Area of object} = 2^2 \times \text{Area of object}$ Area of object = 70 <u>OR</u> Alternative Method: 18 seen $\frac{x}{210} = \frac{6}{18}$ $x = 70$	K1 K1 N1 P1 K1 N1

13	(a) (i)  Note: If seen, award K1 	K2	
	(ii)  (a)	K1	8
	(b) (i)  Note: • 2 out of 3 correct, award P2 • 1 out of 3 correct, award P1 (ii) $40 - 3(7) - y = 16$ $y = 3$	P3 K1 N1	

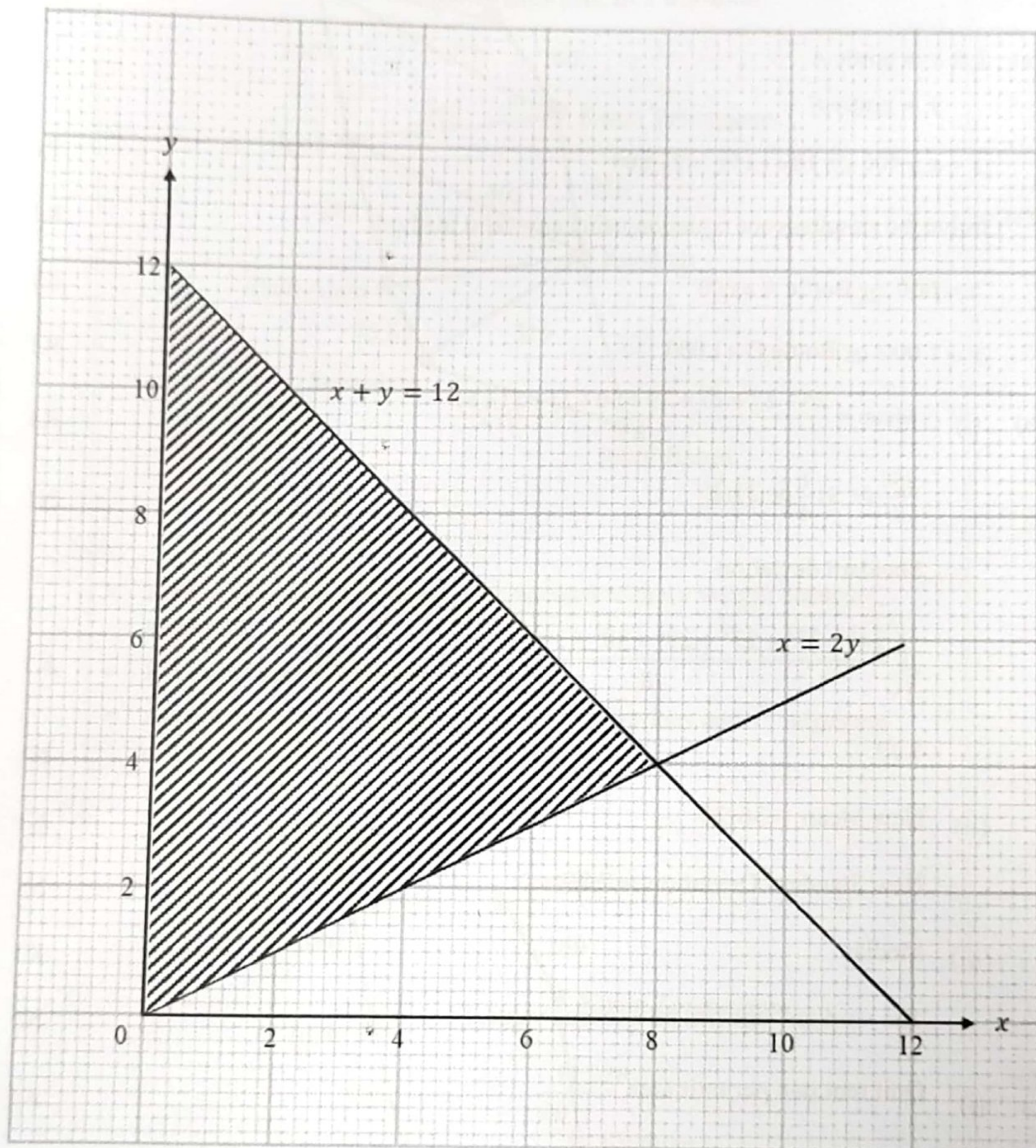
14	<u>Note:</u> For both (a) and (b) • Accept drawing only in the right quadrant. • Correct drawing in the wrong quadrant is not accepted. • If the construction line drawn cannot be distinguished from the actual line, K0N0 marks are given. • If the construction line in the figure is drawn using a dashed / dotted line, subtract 1 mark from N mark. (a) Correct shape with rectangle $ACDF$, $GHKJ$, $XWML$, $VUPN$, $PQTU$, and $QRST$. All solid lines. $AC > AF > FE > ED$ and $GH = HV = VU = UT = ST$ Measurements correct to ± 0.2 cm (one way) All angles at vertices of rectangle $= 90^\circ \pm 1^\circ$ (b) Correct shape with rectangle $AFJG$, $HKLX$, $MWQT$ and $QTDC$. $AF > AG > HX > WT$ LX and QT joined by a dashed line. Measurements correct to ± 0.2 cm (one way) All angles at vertices of rectangle $= 90^\circ \pm 1^\circ$ (Refer diagram on the next page for answer sample)	K1 K1 N1 N1 K1 K1 N1 N1	9
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Answer for Question 14



15	(a) (i) $>$	P1	9
	(ii) $<$	P1	
	(b) (i) $x + y \leq 12$ <u>or</u> equivalent	P1	
	$x \leq 2y$ <u>or</u> equivalent	P1	
	(ii) Axis drawn correctly	P1	
	Note:		
	• Correct scale (2 cm to 2 contestants)		
	• Uniform scale (minimum) $0 \leq x \leq 8$ and $0 \leq y \leq 12$		
	Straight line $x + y = 12$ correctly drawn	K1	
	Straight line $x = 2y$ correctly drawn	K1	
	Region shaded correctly (Refer graph)	N1	
	(iii) 8	N1	
TOTAL MARKS			45

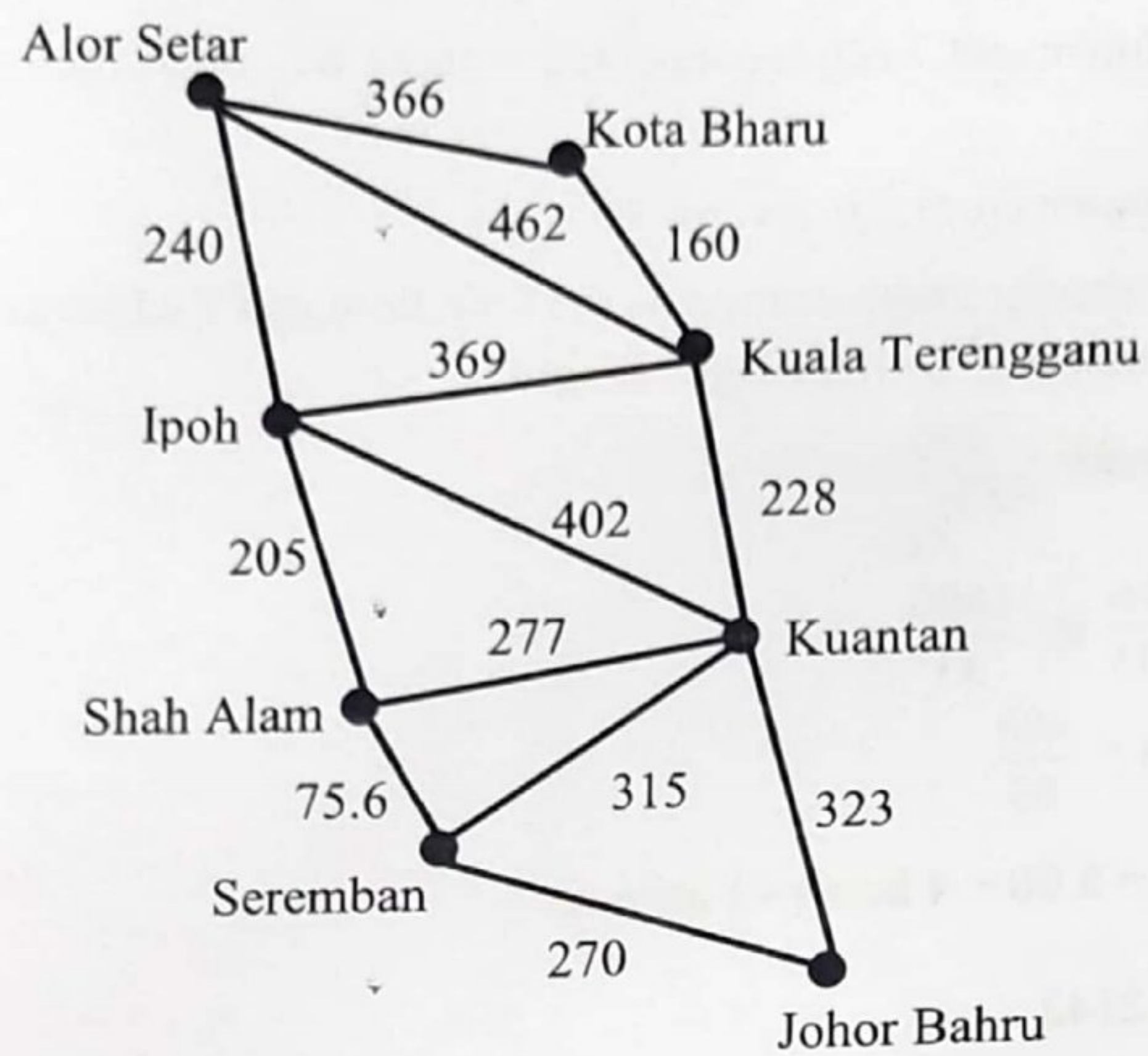
Graph for Question 15 (b) (ii)



SECTION C [15 MARKS]			
NO	Solution and Marking Schemes	Sub Marks	Total
16	(a) Let x = bottle A	-	15
	y = bottle B	-	
	$y - x = 400$ <u>or</u> $18x + 15y = 25\ 800$	P1	
	Solve the simultaneous equation using any valid method	K1	
	$x = 600$ <u>or</u> Bottle A = 600	K1	
	$y = 1\ 000$ <u>or</u> Bottle B = 1 000	K1	
	(b) (i) Mean = $\frac{24 + 27 + 27 + 29 + 30 + 31 + 31 + 51}{8}$	K1	
	$\frac{250}{8}$ <u>or</u> $31\frac{1}{4}$ <u>or</u> 31.25	N1	
	Standard deviation	-	
	$\sqrt{\left(\frac{24^2 + 27^2 + 27^2 + 29^2 + 30^2 + 31^2 + 31^2 + 51^2}{8}\right) - 31.25^2}$	K1	
	7.79	N1	
	(ii) New Mean = 36.25	N1	
	New Standard Deviation = 7.79	N1	
	(iii) Median	K1	
	The workers' age has an extreme value, 51	N1	
	(c) (i) Quit rent rate per unit area = $\frac{11}{1106}$	K1	
	0.01	N1	
	(ii) Accept either one:	P1	
	- State land authority, which is State Land Office - Terengganu State Land Office		

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(a) (i)



N3

Note:

- 8 vertices drawn and 13 edges connected without weight correctly, award N2
- 8 vertices drawn correctly, award N1
- Accept any similar graph as long as the 8 vertices and 13 edges are correctly connected with the right weight

15

(ii)



N3

17	<u>Note:</u> • 8 vertices drawn and 7 edges connected without weight correctly, award N2 • 8 vertices drawn correctly, award N1 • Accept any similar graph as long as the 8 vertices and 7 edges are correctly connected with the right weight (b) (i) Average speed = $\frac{400}{\frac{495}{60}}$ 48.48 <u>or</u> $48\frac{16}{33}$ <u>or</u> $\frac{1600}{33}$ (ii) Time taken, $t = \frac{400}{85}$ Arrival time = 5.00 + 4 hours 42 minutes 9.42 p.m. <u>or</u> 2142 (c) RM 339.10 seen Basic Premium = $339.10 + \left(\frac{71\,000 - 1\,000}{1\,000} \times 26 \right)$ Gross Premium = $2\,159.10 - \left(\frac{25}{100} \times 2\,159.10 \right)$ RM1 619.33	K1 N1 K1 K1 N1 P1 K1 K1 N1	15
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PERATURAN PEMARKAHAN TAMAT