2025

Wednesday, 6 August, 2025 7:30 PM

PP MT K2

MODUL PENINGKATAN PRESTASI

TINGKATAN 5

TAHUN 2025

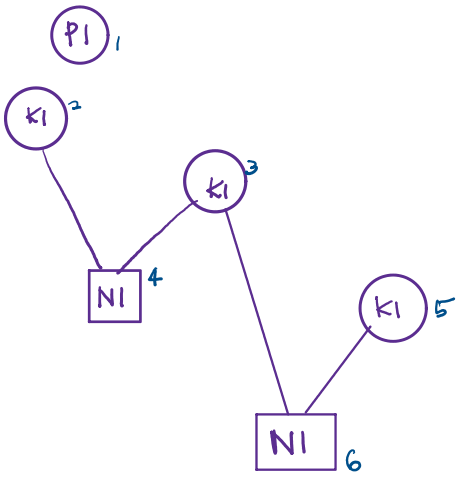
MATEMATIK TAMBAHAN

KERTAS 2

PERATURAN PEMARKAHAN

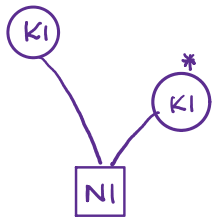
Peraturan Pemarkahan ini mengandungi **18** halaman bercetak

BIL	SKEMA PEMARKAHAN				Sub Markah	Jumlah Markah
1	$x=\frac{2y+5}{3}$	@	$y=\frac{3x-5}{2}$	P1 1	6	6
	$y\left(\left(\frac{2y+5}{3}\right)+y\right)=\left(\frac{2y+5}{3}\right)\left(\left(\frac{2y+5}{3}\right)+y\right)-5$					
	@			K1 2		
	$\left(\frac{3x-5}{2}\right)\left(x+\left(\frac{3x-5}{2}\right)\right)=x\left(x+\left(\frac{3x-5}{2}\right)\right)-5$					
	Selesaikan persamaan kuadratik			K1 3		
	$y=2$	&	$x=3$	N1 4		
	$3m=*3$	@	$-2k=*2$	K1 5		
	$m=1$	&	$k=-1$	N1 6		



BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
2 (*a*)(i)	$\int_0^3 -x^3+3x^2+9x\ dx$ Kamirkan $-x^3+3x^2+9x$ terhadap x K1 $\frac{-x^4}{4}+x^3+\frac{9}{2}x^2$ Guna had $\int_0^3$ ke dalam *kamiran $\left[\left(\frac{-(3)^4}{4}+(3)^3+\frac{9}{2}(3)^2\right)-\left(\frac{-(3)^4}{4}+(3)^3+\frac{9}{2}(3)^2\right)\right]$ K1 $\frac{189}{4}$ N1 **NOTA :** $\int ar^n\ dr$ kuasa bagi r bertambah 1, mesti betul sekurang-kurangnya dua sebutan	3	**8**
2(*a*)(ii)	Dilihat $\left\|\int_k^0 f(x)\ dx\right\|$ P1 $\left\|\frac{k^4}{4}-k^3-\frac{9}{2}k^2\right\|+\frac{189}{4}$ N1	2	
2(b)	$V = \frac{3}{4}\pi\int_2^4 (2y-4)\ dy$ $= \frac{3}{4}\pi\left[\frac{2y^2}{2}-4y\right]_2^4$ P1 [$\frac{3}{4}$ dilihat] $= \frac{3}{4}\pi\left[\left(4^2-4(4)\right)-\left(2^2-4(2)\right)\right]$ K1 $= 3\pi$ unit^3 N1	3	

a) i -



a) ii -

b)

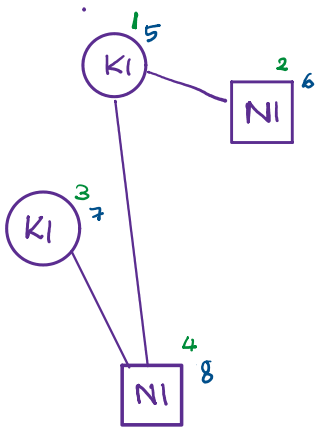
BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
3(a)	$\frac{2^{3x}\times 2}{32^{x-1}}=16^{y}$ @ $\frac{2^{3x+1}}{2^{5x-5}}=2^{4y}$ $2^{3x+1-5x+5}=2^{4y}$ (Dilihat penggunaan Hukum Indeks) $*(3x+1-5x+5)=*4y$ K1 $-2x=4y-6$ $x=3-2y$ N1	2	6
(b)	$x+3\sqrt{x}-10=0$ Ganti $y=\sqrt{x}$, Guna mana^2 pembolehubah : $y^2+3y-10=0$ Selesaikan persamaan kuadratik K1 $(y-2)(y+5)=0$ $y=2,\ y=-5$ $\sqrt{x}=2,$ $\sqrt{x}=-5$ (Diabaikan) $x=4$ N1	2	
(c)	$\frac{\log_2 5^k}{\log_2 8}$ K1(Guna Hukum Log) $\log_2 5^k=\log_2 5^3$ $k=3$ N1	2	

9) K1 — N1

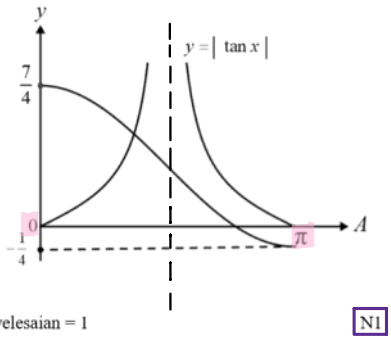
b) K1 — N1

c) K1 — N1

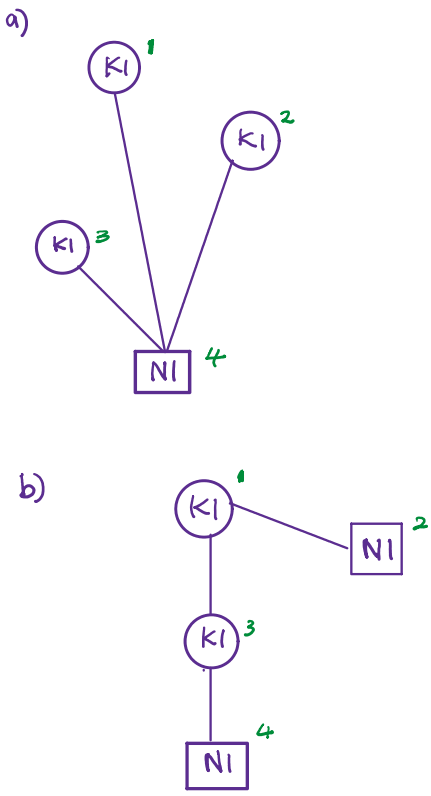
BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
4 (a)	$a=120$ $T_4=120(r)^{4-1}$ $120(r)^3=\frac{320}{9}$ K1 $r=\frac{2}{3}$ N1 $S_\infty=\frac{120}{1-\left(*\frac{2}{3}\right)}$ K1 $S_\infty=360$ N1	4	8
4(b)	$\frac{4}{2}\left[2a+(4-1)(d)\right]=46$ K1 $a=7$ & $d=3$ N1 Sebutan genap: $*T_2$, $*T_4$, $*T_6$,... $S_{10}=\frac{10}{2}\left[2(*10)+(10-1)(*6)\right]$ K1 $S_{10}=370$ N1	4	



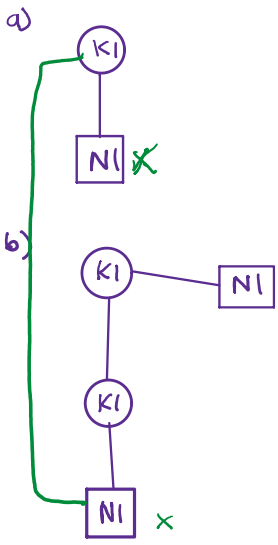
a)

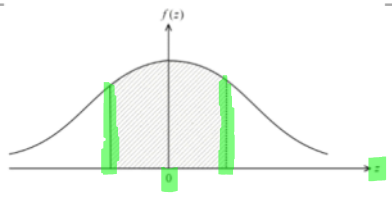
BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
5 (a)	Guna $\sin 2A = 2\sin A\cos A$ @ $\cos 2A = \cos^2 A - \sin^2 A$ K1 $\frac{\sin A}{\cos A}$ (Dilihat) $\tan A$ N1 [semua kiraan betul]	2	
(b)	Bentuk graf kos atau tan P1 1 kitaran & Amplitud (graf kos) P1 1 kitaran & Mutlak (graf tan) P1 Graf kos dan graf tan berada dalam satu paksi yang sama P1  Bilangan penyelesaian = 1 N1	5	7

BIL	SKEMA PEMARKAHAN				Sub Markah	Jumlah Markah
6 (*a*)	$2\|3x-7\|+1$	K1			4	8
	$2\|3x-7\|+1=11$	K1				
	~~$x=4$~~	~~N1~~				
	$x=\frac{2}{3}$ DAN $x=4$	N1				
6 (*b*)	$2(2)^2+p=13$	@	$2(13)-2p+7=23$	K1	4	
	$p=5$	N1				
	$k(x)=4\left(\sqrt{\frac{x-*5}{2}}\right)^2+7$			K1		
	$k(x)=2x-3$			N1		

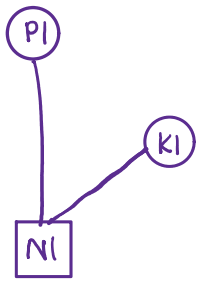


BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
7(a)	Tulis hukum segi tiga vektor K1 $\overrightarrow{AC} = \overrightarrow{AB} + \overrightarrow{BC}$ @ $\overrightarrow{AB} = \overrightarrow{AC} + \overrightarrow{CB}$ $\overrightarrow{AB} = 3\underset{\sim}{i} + 4\underset{\sim}{j}$ N1	2	
7(b)(i)	$\overrightarrow{DB} = \overrightarrow{DA} + \overrightarrow{AB}$ $\overrightarrow{DB} = -9\underset{\sim}{i} - \underset{\sim}{j}$ $\overrightarrow{DR} = 3^{*}\left(-9\underset{\sim}{i} - \underset{\sim}{j}\right)$ K1 $\overrightarrow{DR} = -27\underset{\sim}{i} - 3\underset{\sim}{j}$ N1 $\left\lvert\overrightarrow{DR}\right\rvert = \sqrt{(-27)^2 + (-3)^2}$ K1 $\left\lvert\overrightarrow{DR}\right\rvert = 3\sqrt{82} / 27.17$ N1	4	7
7(b)(ii)	vektor unit $\overrightarrow{DR} = \left(-\frac{9}{\sqrt{82}}\underset{\sim}{i} - \frac{1}{\sqrt{82}}\underset{\sim}{j}\right)^{*}$ N1	1	

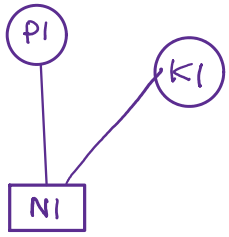


BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
8 (*a*)(i)	$k = 10$ N1		
8(*a*)(ii)	Tulis $P\left(Z < \frac{50-67.74}{\sigma}\right) = 0.1$ @ $P\left(Z \geq \frac{75-67.74}{\sigma}\right) = 0.3$ P1 $\frac{50-67.74}{\sigma} = -1.281$ @ $-\left(\frac{50-67.74}{\sigma}\right) = 1.282$ @ $\frac{75-67.74}{\sigma} = 0.524$ K1 $\sigma = 13.85$ // 13.84 N1	7	
8(*a*)(iii)	 Melakar dengan lengkap, guna alat tepi lurus, melorek kawasan B P1 $\frac{m-67.74}{*13.85} = -0.524$ K1 $m = 60.49$ // 60.48 N1		10
8(*b*)	$(0.30\times0.80\times n)$ @ $(0.70\times1.50\times n)$ K1 $(0.30\times0.80\times n)+(0.70\times1.50\times n)=1548$ K1 $n = 1200$ N1	3	

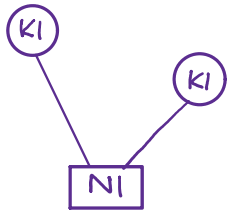
a) ii)



a) iii)

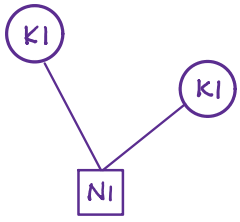


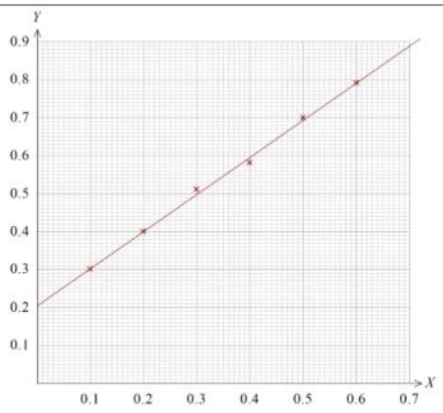
b)



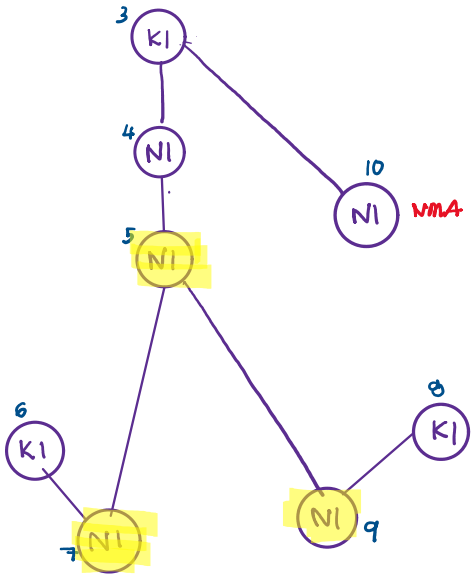
BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
9(a)(i)	$R(0,16)$ N1	1	
9(a)(ii)	$f'(x)=2x^2+9x-18$ K1 $f'(0)=2(0)^2+9(0)-18$ & K1 $(-18)(m_N)=-1$ $m_N=\frac{1}{18}$ N1 **NOTA :** $\frac{d}{dr}(ar^n)$ mesti betul sekurang-kurangnya dua sebutan dengan kuasa r berkurang 1.	3	
9(b)	$*f'(x)=0$ & Selesaikan persamaan kuadratik K1 $x=\frac{3}{2}$, $x=-6$ (abaikan) $*f''(x)=4x+9$ & Gantikan nilai $*x=\frac{3}{2}$ K1 $=15>0$ Q adalah titik minimum. N1 [15 >0 dilihat]	3	**10**
9(c)	$*(2x^2+9x-18)(0.03)$ DAN Gantikan $x=5$ K1 2.31 $\frac{*2.31}{\left(\frac{731}{6}\right)}\times 100$ K1 1.896 N1	3	

a) b) c)



BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
10 (a)	x | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 $\log_{10} y$ | 0.30 | 0.40 | 0.51 | 0.58 | 0.70 | 0.79 1 N1 = Semua nilai bagi $\log_{10} y$ betul sekurang-kurangnya 2 tempat perpuluhan	1	
10 (b)	$\lg y = kx + \lg h$ atau $\log_{10} y = kx + \log_{10} h$ N1 2	1	
10 (c)	 3 K1 = Sekurang-kurangnya 1 titik diplotkan dengan betul dan paksi-X dan paksi-Y dilabel dengan seragam. 4 N1 = ~~Sekurang-kurangnya 5 titik diplotkan dengan betul~~ 6 *titik diplot dengan betul 5 N1 = Garis lurus penyuaian terbaik (seimbang) sekurang-kurangnya 5 titik diplotkan dengan betul	3	10
10 (d) (i)	$k = *m$ K1 6 [Dua nilai yang diambil mesti berada pada garis lurus penyuaian terbaik] $k = *0.98$ N1 7 $0.9 < k < 1.1$ $\log_{10} h = *c$ K1 8 $h = *1.585$ N1 9 K0N0 = Jika menggunakan nilai yang tidak diambil dari graf $0.19 \le h \le 0.21$ ✗	4	
10 (d) (ii)	~~0.74 ±0.02~~ N1 10 3.548	1	

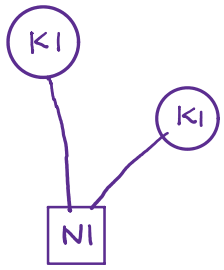
$5.248 \le y \le 5.754$



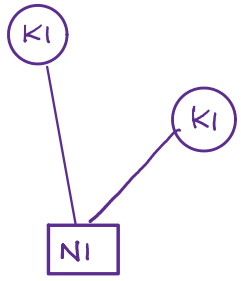
BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
11 (a)	$\left(\frac{0-8}{k-(-2)}\right)\left(\frac{4-0}{10-k}\right)=-1$ K1 Selesaikan persamaan kuadratik K1 $k=2$ atau $k=6$ (diabaikan) $k=2$ N1	3	10
11 (b)	$m_1\left(-\frac{1}{3}\right)=-1$ K1 $m_1=3$ Gantikan (0,2) ke dalam $y-y_1=3(x-x_1)$ atau K1 Gantikan (0,2) ke dalam $y=3x+c$ DAN Selesaikan untuk c $y=3x-6$ N1	3	
11 (c)	$F(h,k)=\left(\frac{1(2)+3(10)}{3+1},\frac{1(0)+3(4)}{3+1}\right)$ K1[1] $=(8,3)$ N1[2] Luas $\Delta=\frac{1}{2}\lvert(-2(0)+*2(*3)+*8(8))-(8(*2)+0(*8)+*3(-2))\rvert$ K1[3] $=30$ unit^2 N1[4]	4	

12

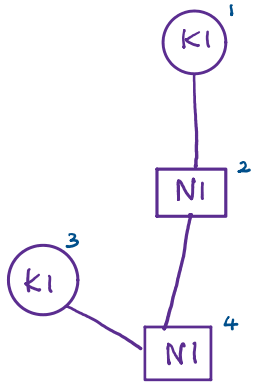
a)



b)



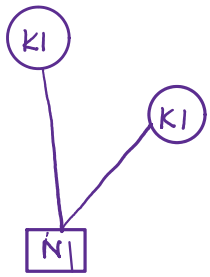
c)



BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
12 (a)	$a_A = 2t$ $V_A = \int (2t)dt$ $V_A = \frac{2t^2}{2} + c$ K1 $t = 0, V_A = -4$ $V_A = t^2 - 4$ $V_A = 0$ $t^2 - 4 = 0$ K1 $(t-2)(t+2) = 0$ $t = -2$ *(abaikan)* $\therefore t = 2s$ N1	3	10
(b)	$S_A = \int (t^2 - 4)dt$ $S_A = \frac{t^3}{3} - 4t + c; t = 0, S_A = 0, c = 0$ $S_A = \frac{t^3}{3} - 4t$ $; t = 2s$ DAN K1 $S_A = \frac{(2)^3}{3} - 4(2)$ $S_A = -\frac{16}{3}$ Jarak $= \frac{16}{3}$ m N1	2	
(c)	$V_B = t^2 - 4t$ $S_B = \int (t^2 - 4t)dt$ $S_B = \frac{t^3}{3} - 2t^2 + c$ $; t = 0, S_B = 0, c = 0$ $S_B = \frac{t^3}{3} - 2t^2, S_A = \frac{t^3}{3} - 4t$ $S_A = S_B + 6$ $\frac{t^3}{3} - 4t = \frac{t^3}{3} - 2t^2 + 6$ K1 $\frac{t^3}{3} - \frac{t^3}{3} + 2t^2 - 4t - 6 = 0$ $2t^2 - 4t - 6 = 0$ $t^2 - 2t - 3 = 0$ $(t-3)(t+1) = 0$ $t = 3, t = -1$(diabaikan) N1	2	

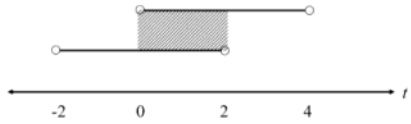
13

a)

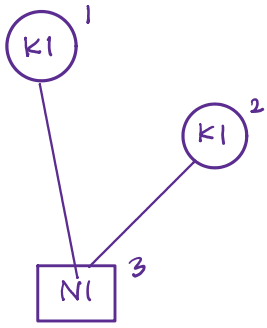


b)

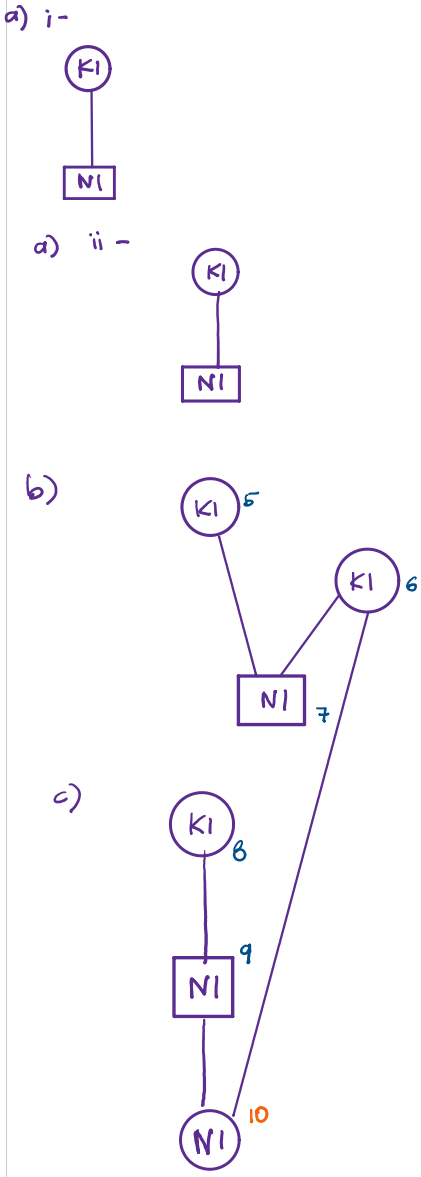
c)

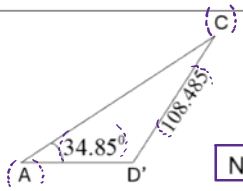
(d)	$V_A = t^2 - 4$ $V_A < 0$ $t^2 - 4 < 0$ $(t-2)(t+2) < 0$ Garis Nombor/Graf/Jadual $-2 < t < 2$ $t^2 - 4 < 0$ ATAU $t^2 - 4t < 0$ K1[1] $V_B = t^2 - 4t$ $V_B < 0$ $t^2 - 4t < 0$ $t(t-4) < 0$ Garis Nombor/Graf/Jadual $0 < t < 4$  K1[2] $0 < t < 2$ N1[3]	3	

d)

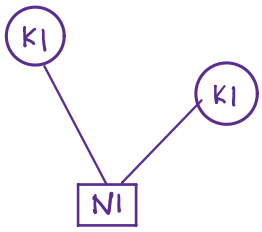


BIL	SKEMA PEMARKAHAN		Sub Markah	Jumlah Markah
13 (a)(i)	$\frac{P_{2025}}{57.60}\times 100 = 120$	K1 1	2	10
	RM 69.12	N1 2		
(a)(ii)	$\frac{P_{2027}}{P_{2027}-17.00} = 2.176$	K1 3	2	
	RM 31.46	N1 4		
(b)	$\bar{I}_{\frac{2025}{2020}} = \frac{90(50)+160(30)+120(10)+140(10)}{50+30+10+10}$	K1 5	3	
	$\bar{I}_{\frac{2025}{2020}} = 119$			
	$\frac{41650}{P_{2020}}\times 100 = *119$	K1 6		
	RM 35000	N1 7		
~~(d)~~ (c)	$I_{\frac{2027}{2025}} = \frac{160}{119^{*}}\times 100$	K1 8	3	
	$I_{\frac{2027}{2025}} = 134.45$	N1 9		
	Meningkat DAN 34.45%	N1 10		

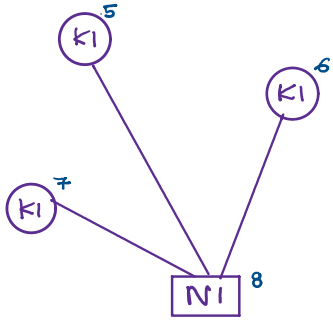


BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
14 (a)(i)	$\frac{AC}{\sin 45^0} = \frac{108.485}{\sin 34.85^0}$ K1 1 134.24 $s = \frac{80+90+*134.24}{2}$ (Dilihat) 152.12 $\sqrt{*152.12(*152.12-80)(*152.12-90)(*152.12-*134.24)}$ K1 2 $3490.70 \leftrightarrow 3490.76$ N1 3	3	10
(a)(ii)	 N1 4 NOTA : $\angle ADC$ merupakan sudut cakah (dilihat)	1	
(a)(iii)	$\frac{AD}{\sin 100.15^0} = \frac{*134.24}{\sin 45^0}$ @ $\frac{AD}{\sin 100.15^0} = \frac{108.485}{\sin 34.85^0}$ K1 5 $\frac{1}{2} \times 134.24 \times 108.485 \times \sin 100.15^0$ @ $\frac{1}{2} \times 186.88 \times 134.24 \times \sin 34.85^0$ @ K1 6 $\frac{1}{2} \times 186.88 \times 108.485 \times \sin 45^0$ $\frac{1}{2} \times 186.88 \times t = *7167.56$ K1 7 $[7167.56 \Leftrightarrow 7167.83]$ 76.71 N1 8	4	
(b)	Katakan $AD = t$ (Dilihat mana-mana pembolehubah) $\sin B = \frac{t}{c}$ @ $\sin C = \frac{t}{b}$ @ $t = c \sin B$ @ $t = b \sin C$ K1 9 $b \sin C = c \sin B$ & $\frac{b}{\sin B} = \frac{c}{\sin C}$ N1 10	2	

a) i -

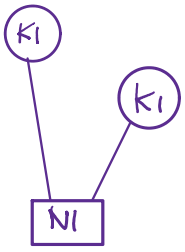


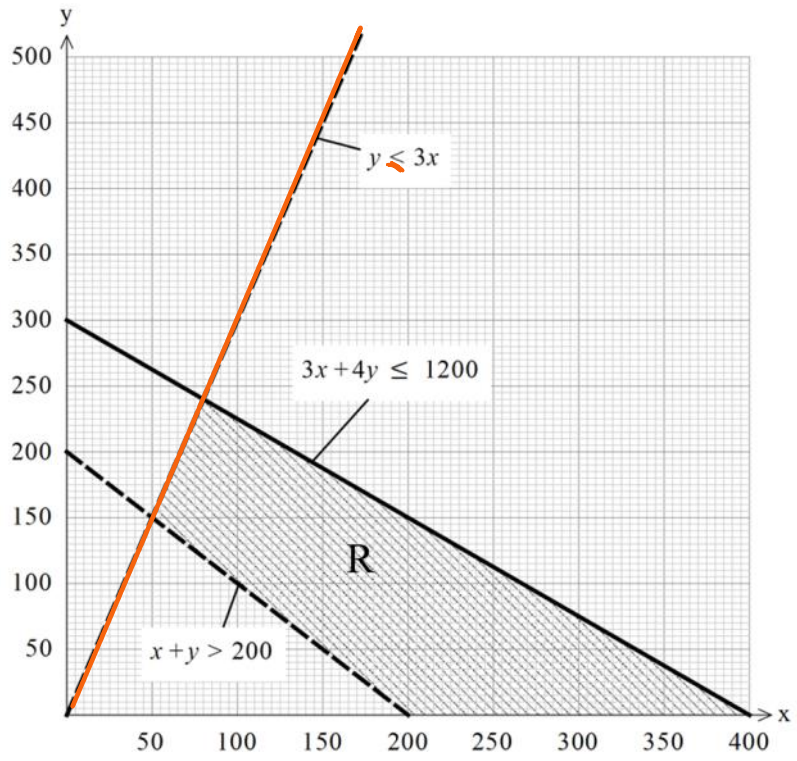
a) iii -



b)

BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
15 (a)	$x + y > 200$ 1 N1 ✓ $3x + 4y \leq 1200$ 2 N1 $y \leq 3x$ 3 N1 * Simbol = digunakan N1', N0⁶	3	10
(b)	4 K1 – Lukis dengan betul sekurang-kurangnya satu garis lurus dari *ketaksamaan yang melibatkan ***x* dan *y*** pada paksi-paksi yang bermula dari asalan. 5 N1 – Lukis dengan betul **semua** *garis lurus dari *ketaksamaan yang melibatkan x dan/atau y Nota : Terima garis putus-putus dan garis lurus 6 N1 – Rantau dilorek dengan betul.	3	
(c)	i) 150 N1 (Integer sahaja) NMA ii) $k = 2x + 3y$ DAN grat fungsi objektif – dilihat K1 $= 2(80) + 3(240)$ K1 → Gantikan mana² integer dalam rantaunya. $= 880$ N1	4	





TAMAT

THE END

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