



PP MT K2

MODUL PENINGKATAN PRESTASI

TINGKATAN 5

TAHUN 2025

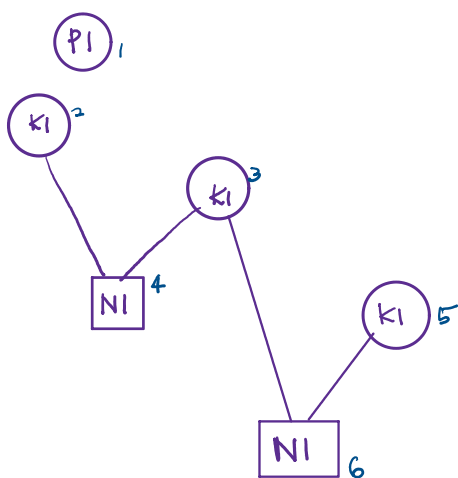
MATEMATIK TAMBAHAN

KERTAS 2

PERATURAN PEMARKAHAN

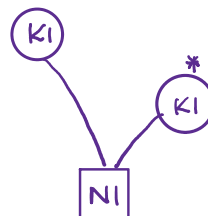
Peraturan Pemarkahan ini mengandungi **18** halaman bercetak

BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
1	$x = \frac{2y+5}{3} \quad @ \quad y = \frac{3x-5}{2}$ $y\left(\left(\frac{2y+5}{3}\right) + y\right) = \left(\frac{2y+5}{3}\right)\left(\left(\frac{2y+5}{3}\right) + y\right) - 5$ $@$ $\left(\frac{3x-5}{2}\right)\left(x + \left(\frac{3x-5}{2}\right)\right) = x\left(x + \left(\frac{3x-5}{2}\right)\right) - 5$ Selesaikan persamaan kuadratik $y = 2 \quad \& \quad x = 3$ $3m = *3 \quad @ \quad -2k = *2$ $m = 1 \quad \& \quad k = -1$	6	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 ← K1^① $\frac{-x^4}{4} + x^3 + \frac{9}{2}x^2$ Guna had $\int_0^3$ ke dalam *kamiran $\left[\left(\frac{-3^4}{4} + 3^3 + \frac{9}{2}(3)^2 \right) - \left(\frac{-3^4}{4} + 3^3 + \frac{9}{2}(3)^2 \right) \right] \quad \text{K1}^2$ $\frac{189}{4} \quad \text{N1}$ NOTA : $\int ar^n \, dx$ 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 $\left \frac{k^4}{4} - k^3 - \frac{9}{2}k^2 + \frac{189}{4} \right \quad \text{N1}$	2	
2(b)	$V = \frac{3}{4}\pi \int_2^4 (2y - 4) \, dy$ $= \frac{3}{4}\pi \left[\frac{2y^2}{2} - 4y \right]_2^4 \quad \text{P1} \left[\frac{3}{4} \text{ dilihat} \right]$ $= \frac{3}{4}\pi \left[(4^2 - 4(4)) - (2^2 - 4(2)) \right] \quad \text{K1}$ $= 3\pi \text{ unit}^3 \quad \text{N1}$	3	

a) i-



a) ii-

(P1)

(N1)

b)

(P1)

(K1)

(N1)

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 mana² pembolehubah : $y^2 + 3y - 10 = 0$ Selesaikan persamaan kuadratik $(y-2)(y+5) = 0$ K1 $y = 2, \quad y = -5$ $\sqrt{x} = 2,$ $\sqrt{x} = -5 \quad (\text{Diabaikan})$ $x = 4$ 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	

a)



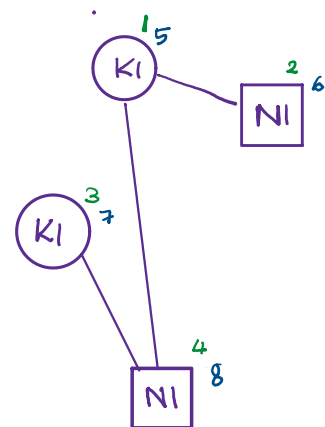
b)



c)



BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
4 (a)	$a = 120$ $T_4 = 120(r)^{4-1}$ $120(r)^3 = \frac{320}{9}$ K1 1 $r = \frac{2}{3}$ N1 2 $S_{\infty} = \frac{120}{1 - \left(\frac{2}{3}\right)}$ K1 3 $S_{\infty} = 360$ N1 4	4	8
4(b)	$\frac{4}{2}[2a + (4-1)(d)] = 46$ K1 5 $a = 7$ & $d = 3$ N1 6 Sebutan genap: $*T_2, *T_4, *T_6, \dots$ $S_{10} = \frac{10}{2}[2(*10) + (10-1)(*6)]$ K1 7 $S_{10} = 370$ N1 8	4	



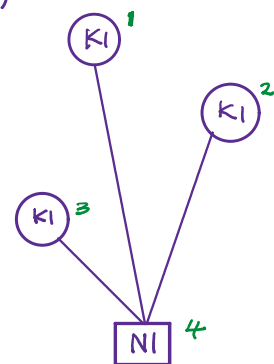
a)



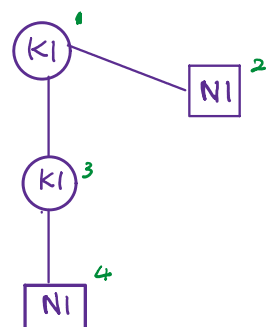
BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
5 (a)	Guna $\sin 2A = 2 \sin A \cos A$ @ $\cos 2A = \cos^2 A - \sin^2 A$ K1 $\frac{\sin A}{\cos A}$ (Dilihat) $\tan A$ N1 [semua kiraan betul]	2	7
(b)	Bentuk graf kos atau tan (P1) 1 kitaran & Amplitud (graf kos) (P1) ✗ 1 kitaran & Mutlak (graf tan) (P1)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

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

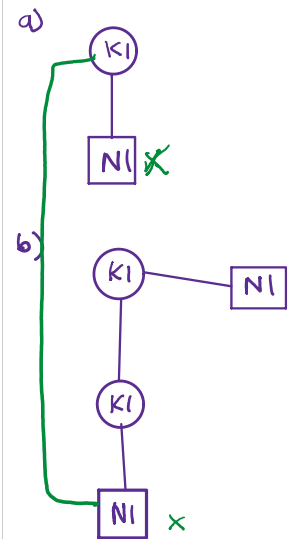
a)

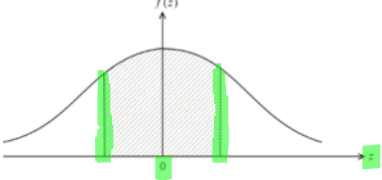


b)

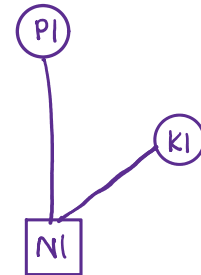


BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
7(a)	Tulis hukum segi tiga vektor K1 $\vec{AC} = \vec{AB} + \vec{BC}$ @ $\vec{AB} = \vec{AC} + \vec{CB}$ X $\vec{AB} = 3\hat{i} + 4\hat{j}$ N1 ✓	2	7
7(b)(i)	$\vec{DB} = \vec{DA} + \vec{AB}$ ✓ $\vec{DB} = -9\hat{i} - \hat{j}$ $\vec{DR} = 3 \cdot (-9\hat{i}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

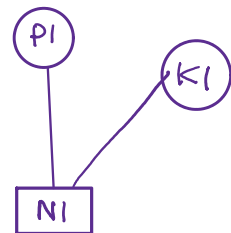


BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
8 (a)(i)	$k = 10$ N1	7	10
8(a)(ii)	Tulis $P\left(Z < \frac{50 - 67.74}{\sigma}\right) = 0.1$ @ $P\left(Z \geq \frac{75 - 67.74}{\sigma}\right) = 0.3$ P1 $\frac{50 - 67.74}{\sigma} = -1.281$ @ $\frac{75 - 67.74}{\sigma} = 1.282$ @ $\frac{75 - 67.74}{\sigma} = 0.524$ K1 $\sigma = 13.85$ // 13.84 N1		
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		
8(b)	$(0.30 \times 0.80 \times n)$ @ $(0.70 \times 1.50 \times n)$ K1 $(0.30 \times 0.80 \times n) + (0.70 \times 1.50 \times n) = 1548$ K1 $n = 1200$ N1	3	

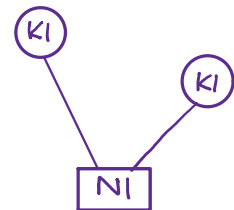
a) ii)



a) iii)

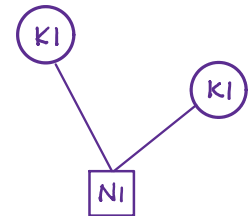


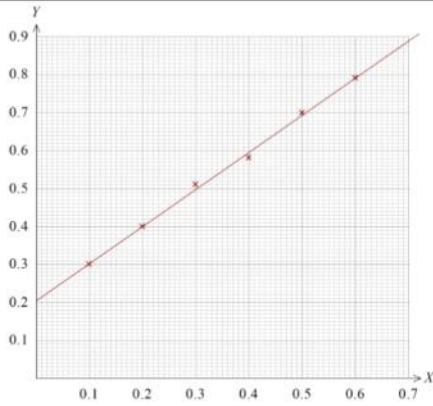
b)



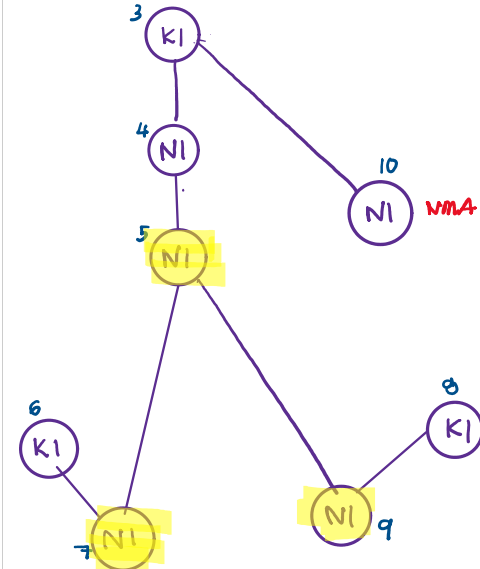
BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
9(a)(i)	$R(0,16)$ N1	1	10
9(a)(ii)	$f'(x) = 2x^2 + 9x - 18$ ~~~~~ K1 $f'(0) = 2(0)^2 + 9(0) - 18$ & } K1 $(-18)(m_N) = -1$ $m_N = \frac{1}{18}$ N1 NOTA : $\frac{d}{dr}(ar^n)$ mesti betul sekurang-kurangnya dua sebutan dengan kuasa r berkurang 1.	3	
9(b)	$*f'(x)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



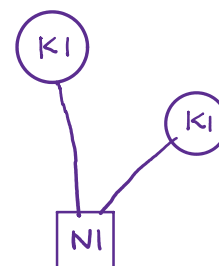
BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah														
10 (a)	<table><tr><td>x</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.5</td><td>0.6</td></tr><tr><td>$\log_{10} y$</td><td>0.30</td><td>0.40</td><td>0.51</td><td>0.58</td><td>0.70</td><td>0.79</td></tr></table> 1 N1 = Semua nilai bagi $\log_{10} y$ betul sekurang-kurangnya 2 tempat perpuluhan	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	10
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											
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-Y dilabel dengan seragam. 4 N1 = Sekurang-kurangnya 5 titik diplotkan dengan betul 6 *titik diplot dengan betul 5 N1 = Garis lurus penyuaiian terbaik (seimbang) sekurang-kurangnya 5 titik diplotkan dengan betul	3															
10 (d) (i)	$k = *m$ K1 6 [Dua nilai yang diambil mesti berada pada garis lurus penyuaiian terbaik] $k = *0.98$ N1 7 $0.9 < k < 1.1$ $\log_{10} h = *c$ K1 8 $h = *1.585$ N1 9 KON0 = Jika menggunakan nilai yang tidak diambil dari graf $0.19 \leq h \leq 0.21$ ✗	4															
10 (d) (ii)	0.74 ±0.02 N1 10 3.548	1															

$$5.248 \leq y \leq 5.754$$

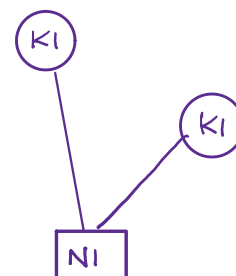


BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
11 (a)	$\left(\frac{0-8}{k-(-2)}\right)\left(\frac{4-0}{10-k}\right) = -1$ K1 Selesaikan persamaan kuadratik K1 $k = 2$ atau $k = 6$ (diabaikan) $k = 2$ N1	3	10
11 (b)	$m_1\left(-\frac{1}{3}\right) = -1$ K1 $m_1 = 3$ Gantikan (0,2) ke dalam $y - y_1 = 3(x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

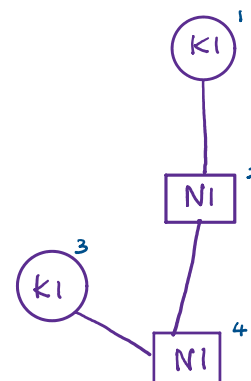
a)



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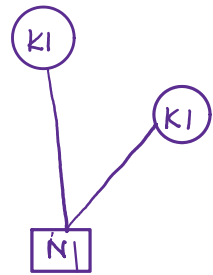
c)



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)

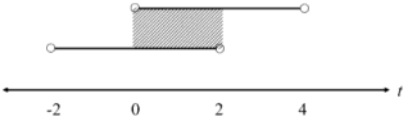


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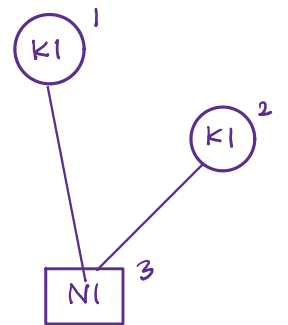


c)



(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 $0 < t < 4$ 	3	

d)



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

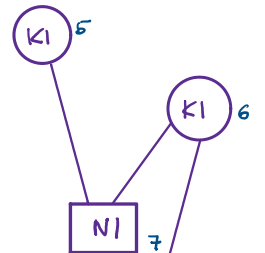
a) i -



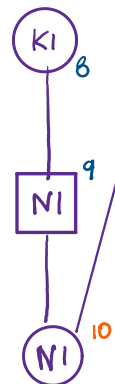
a) ii -



b)

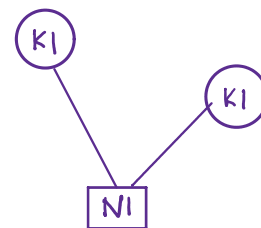


c)

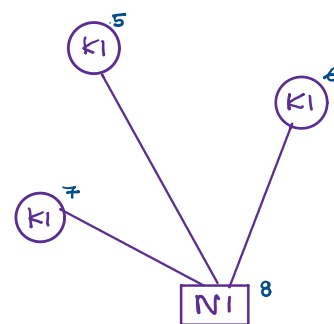


BIL	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
14 (a)(i)	$\frac{AC}{\sin 45^\circ} = \frac{108.485}{\sin 34.85^\circ}$ 134.24 $s = \frac{80 + 90 + *134.24}{2}$ 152.12 $\sqrt{*152.12(*152.12 - 80)(*152.12 - 90)(*152.12 - *134.24)}$ $3490.70 \leftrightarrow 3490.76$ K1 1 N1 3	3	10
(a)(ii)	N1 4	1	
(a)(iii)	$\frac{AD}{\sin 100.15^\circ} = \frac{*134.24}{\sin 45^\circ} @ \frac{AD}{\sin 100.15^\circ} = \frac{108.485}{\sin 34.85^\circ}$ $\frac{1}{2} * 134.24 \times 108.485 \times \sin 100.15^\circ @$ $\frac{1}{2} \times 186.88 \times 134.24 \times \sin 34.85^\circ @$ $\frac{1}{2} \times 186.88 \times 108.485 \times \sin 45^\circ$ $\frac{1}{2} \times 186.88 \times t = *7167.56$ $[7167.56 \leftrightarrow 7167.83]$ 76.71 K1 5 K1 6 K1 7 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 $b \sin C = c \sin B \quad \& \quad \frac{b}{\sin B} = \frac{c}{\sin C}$ N1 10	2	

a) i-



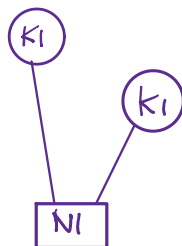
a) ii-

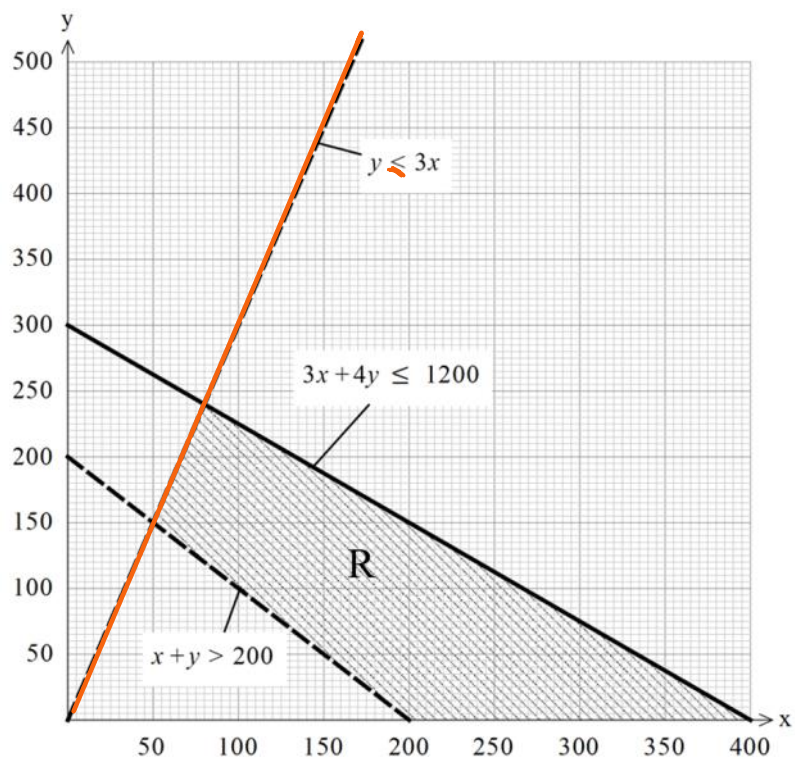


b)



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 $\neq$ digunakan N1, NO ⁶	3	10
(b)	K1 – Lukis dengan betul sekurang-kurangnya satu garis lurus dari *ketaksamaan yang melibatkan x dan y pada paksi-paksi yang bermula dari asalan. N1 – Lukis dengan betul semua *garis lurus dari *ketaksamaan yang melibatkan x dan/atau y Nota : Terima garis putus-putus dan garis lurus N1 – Rantau dilorek dengan betul.	3	
(c)	i) 150 N1 (Integer sahaja) NMA ii) $k = 2x + 3y$ DAN graf fungs. objektif – dilihat $= 2(80) + 3(240)$ K1 → Gantikan mana $\neq$ integer dalam rantaunya. $= 880$ N1	4	





TAMAT
THE END