

**MODUL PINTAS
TINGKATAN 5**

**MATEMATIK TAMBAHAN
Kertas 1**

3472/1

2 jam

Dua jam

**PERATURAN PEMARKAHAN
MATEMATIK TAMBAHAN K1
3472/1**

MATEMATIK TAMBAHAN KERTAS 1

NO	PENYELESAIAN	MARKAH		
1.	(a) $ck + d = 0$ $ck = -d$ $k = -\frac{d}{c}$ Katakan $g^{-1}(x) = y$ $g(y) = x$ $\frac{ay + b}{cy + d} = x$ $ay + b = xcy + xd$ $y = \frac{dx - b}{-cx + a}$ $g^{-1}(x) = \frac{-dx + b}{cx - a}, x \neq \frac{a}{c}$	N1	5	6
	(b) (i) $g^{-1}(x) = \frac{3x - 4}{2x - 7}, x \neq \frac{7}{2}$	N1		
	(ii) $g^{-1}(x) = \frac{5x - 3}{x - 2}, x \neq 2$	N1		
	(c) $g(x) = g^{-1}(x)$ jika $a = -d$	N1	1	
2.	$5 < 2x^2 + x + 4$ $2x^2 + x - 1 > 0$ $(2x - 1)(x + 1) > 0$ $x < -1, x > \frac{1}{2}$ $2x^2 + x - 6 < 0$ $(2x - 3)(x + 2) < 0$ $-2 < x < \frac{3}{2}$ $x < -1, x > \frac{1}{2}$ ATAU $-2 < x < \frac{3}{2}$ $-2 < x < -1$ or $\frac{1}{2} < x < \frac{3}{2}$	K1	4	4
		K1		
		N1		
		N1		

5.	(a) $S_n = a + ar + ar^2 + ar^3 + \dots + ar^{n-2} + ar^{n-1} \dots \dots \dots (1)$ $(1) \times r : rS_n = ar + ar^2 + ar^3 + ar^4 + \dots + ar^{n-1} + ar^n \dots \dots \dots (2)$ $(2) - (1), rS_n - S_n = ar^n - a$ $S_n(r - 1) = a(r^n - 1)$ $S_n = \frac{a(r^n - 1)}{r - 1}, r > 1$	K1 K1 N1	3	7
	(b) $S_{2n} = 28S_n$ $\frac{a((3)^{2n} - 1)}{3 - 1} = 28 \left(\frac{a((3)^n - 1)}{3 - 1} \right)$ $(3)^{2n} - 1 = 28(3)^n - 28$ $\text{Let } (3)^n = y$ $y^2 - 1 = 28y - 28$ $0 = y^2 - 28y + 27$ $0 = (y - 1)(y - 27)$ $y = 1 \text{ or } y = 27$ $(3)^n = 1 \text{ or } (3)^n = 27$ $(3)^n = (3)^0 \text{ or } (3)^n = (3)^3$ $n = 0 \text{ (ignored) , } n = 3$ $n = 3$	K1 K1 K1 N1	4	
6	(a) $\begin{array}{lll} x = 3, & \log_3 y = \log_3 3^3 = 3 & A(3, 3) \\ x = 1, & \log_3 y = \log_3 3^2 = 2 & B(1, 2) \end{array} \quad \left. \vphantom{\begin{array}{l} x = 3, \\ x = 1, \end{array}} \right\} \text{Kedua-dua betul}$ 	K1 N1	2	5

	(b) $27 = p^3 q \dots\dots\dots (1)$ $9 = p^1 q \dots\dots\dots (2)$ } Kedua-dua betul Dari (2), $q = \frac{9}{p} \dots\dots\dots (3)$ Gantikan (3) ke dalam (1) $27 = p^3 \left(\frac{9}{p} \right)$ $27 = 9p^2$ $3 = p^2$ $p = \sqrt{3}$ Gantikan $p = \sqrt{3}$ ke dalam (2) $\frac{9}{\sqrt{3}} = q$ $q = 3^{\frac{3}{2}}$ $q = 3\sqrt{3}$	K1		
		N1	3	
		N1		
7	(a) $2y - x = 1$ $y = \frac{x+1}{2}$ $m = \frac{1}{2}$ $\frac{0-(-1)}{p-4} = \frac{1}{2}$ $p - 4 = 2$ $p = 6$	K1	2	
		N1		
	(b) $\frac{1}{2} \times m_2 = -1$ $m_2 = -2$ $y = -2x + c$ $-1 = -2(4) + c$ $c = 7$ $y = -2x + 7$ $2(-2x + 7) - x = 1$ $x = \frac{13}{5}$ $A\left(\frac{13}{5}, \frac{9}{5}\right)$	K1		5
		K1	3	
		K1		
		N1		

8	(a) $\overrightarrow{OS} = 5\underline{x} + \frac{2}{3}\overrightarrow{PQ}$ $= 5\underline{x} + \frac{2}{3}(-5\underline{x} + \underline{y})$ $= 5\underline{x} - \frac{10}{3}\underline{x} + \frac{2}{3}\underline{y}$ $= \frac{5}{3}\underline{x} + \frac{2}{3}\underline{y}$	K1	2	5
	(b) $\overrightarrow{RS} = \overrightarrow{RO} + \overrightarrow{OS}$ $= -\frac{3}{5}(5\underline{x}) + \frac{5}{3}\underline{x} + \frac{2}{3}\underline{y}$ $= -\frac{4}{3}\underline{x} + \frac{2}{3}\underline{y}$ $= \frac{\sqrt{23}}{3}\left(-\frac{4}{3}\underline{x} + \frac{2}{3}\underline{y}\right)$	K1	3	
9.	(a) $\tan A = \frac{10}{5}$ $A = 63.43^0$ $= 1.107 \text{ rad}$	N1	1	6
	(b) $r = 11.18$ $s = 11.18 (1.107)$ $= 12.376$ Perimeter $= (11.18 \times 2) + 12.376$ $= 34.736$	K1	3	
	(c) Luas sektor major $= \frac{1}{2} (11.18)^2 (5.177)$ $= 323.54$	K1	2	
10	(a) $y = 3x^2 - 2x + 3$ $\frac{dy}{dx} = 6x - 2$ $= 6(2) - 2$ $= 10$	K1	2	

	(b) $\delta x = m$ $\frac{\delta y}{\delta x} = 6x - 2$ $\frac{\delta y}{m} = 6x - 2$ $\delta y = (6(2) - 2) m$ $\delta y = 10m$ $x = 2, y = 11$ $\frac{10m}{11} \times 100$ $90.91m\%$	K1 N1 N1	3	5
11	(a) $y = x^2 + 3$ $y + x = 9$ $x^2 + 3 + x = 9$ $x^2 + x - 6 = 0$ $x = -3 \text{ dan } x = 2$ $k = 2$ $\int_0^2 9 - x \, dx - \int_0^2 x^2 + 3 \, dx$ $\left[9x - \frac{x^2}{2} \right]_0^2 - \left[\frac{x^3}{3} + 3x \right]_0^2$ $16 - \frac{26}{3}$ $\frac{22}{3}$	K1 K1 N1	3	5
	(b) $\int_0^2 \pi(x^2 + 3)^2 \, dx$ $\pi \int_0^2 x^4 + 6x^2 + 9 \, dx$ $\left[\frac{x^5}{5} + \frac{6x^3}{3} + 9x \right]_0^2 \pi$ $\frac{202}{5} \pi$	K1 N1	2	

12	(a) ${}^3P_3 \times {}^4P_4 \times 5$ 720	K1	2	5
	(b) ${}^{10}C_4 \times {}^6C_6$ atau ${}^{10}C_5 \times {}^5C_5$ atau ${}^{10}C_6 \times {}^4C_4$ (mana-mana dua betul) ${}^{10}C_4 \times {}^6C_6 + {}^{10}C_5 \times {}^5C_5 + {}^{10}C_6 \times {}^4C_4$ 672	K1 K1 N1	3	
13	(a) (i) $p = \frac{1}{5} \quad q = \frac{4}{5}$ $P(x=1) = 16P(x=0)$ ${}^nC_1 \left(\frac{1}{5}\right)^1 \left(\frac{4}{5}\right)^{n-1} = 16 \left[{}^nC_0 \left(\frac{1}{5}\right)^0 \left(\frac{4}{5}\right)^{n-0} \right]$ $n \left(\frac{1}{5}\right) \left(\frac{4}{5}\right)^{n-1} = 16 \left(\frac{4}{5}\right)^n$ $\frac{1}{5}n = 16 \left(\frac{4}{5}\right)$ $n = 64$ (ii) $\mu = 64 \left(\frac{1}{5}\right) = 12.8$	K1 K1 N1 N1	4	8
	(b) (i) $P(Z > 2.159)$ $= P(Z < -2.159) + P(Z > 2.159)$ $= 2P(Z > 2.159)$ $= 2(0.0154)$ $= 0.0308$ (ii) $P(Z \leq 1.684)$ $= P(-1.684 \leq Z \leq 1.684)$ $= 1 - P(Z < -1.684) - P(Z > 1.684)$ $= 1 - 2P(Z > 1.684)$ $= 1 - 2(0.0461)$ $= 1 - 0.0922$ $= 0.9078$	K1 N1 K1 N1	4	

15	(a) $18^2 = 15^2 + 24^2 - 2 (15) (24) \cos C$ $\cos C = 0.6625$ $\angle ACB = 48.51^\circ$	K1 K1 N1	3	8
	(b) $\frac{71.49^\circ}{8} = \frac{DE}{\sin 71.49^\circ}$ $DE = 6.319$	P1 K1 N1	3	
	(c) $\frac{BT}{\sin 48.51^\circ} = \frac{15}{\sin 90^\circ}$ $BT = 11.236$	K1 N1	2	

PERATURAN PEMARKAHAN TAMAT

**MODUL PINTAS
TINGKATAN 5**

3472/2

**MATEMATIK TAMBAHAN
Kertas 2**

$2\frac{1}{2}$ jam

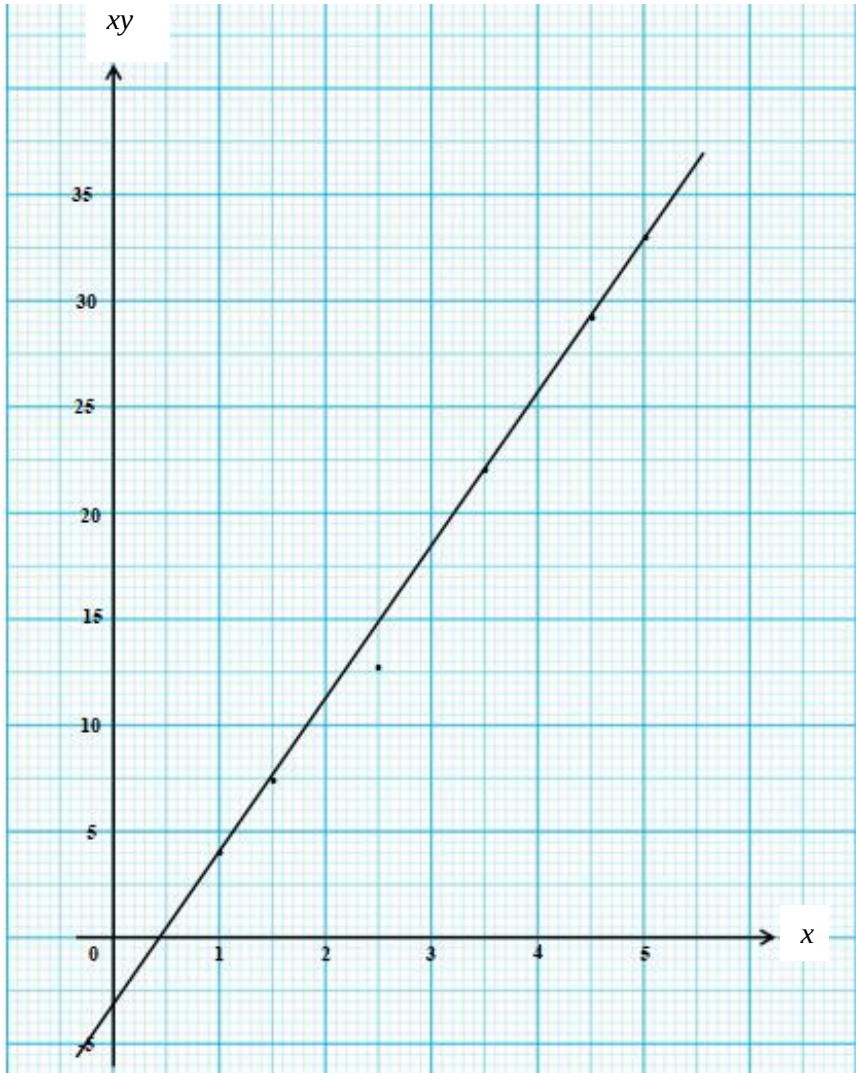
Dua jam tiga puluh minit

**PERATURAN PEMARKAHAN
MATEMATIK TAMBAHAN K2
3472/2**

NO.	PENYELESAIAN	MARKAH		
1	$P + Q + R = 38\,500$ $0.04P + 0.055Q + 0.06R = 1\,877.50$ $P = 3R$	Mana-mana dua persamaan betul dapat K1 K1 K1	7	7
	$3R + Q + R = 38\,500$ $Q + 4R = 38\,500$ $Q = 38\,500 - 4R$ $0.04(3R) + 0.055(38\,500 - 4R) + 0.06R = 1\,877.50$	P1 K1		
	$R = \text{RM } 6000$ $P = \text{RM } 18\,000$ $Q = \text{RM } 14\,500$	N1 N1 N1		
2	(a) $V = \pi r^2 h$ $V = \pi r^2 (2r)$ $V = 2\pi r^3$ $\frac{dV}{dr} = 6\pi r^2$ $3 = 6\pi(9)^2 \times \frac{dr}{dt}$ $\frac{dr}{dt} = \frac{1}{162\pi}$	K1 K1 N1	3	7
	(b) $r = \frac{h}{2}$ $V = \pi \left(\frac{h}{2}\right)^2 h$ $\frac{dV}{dh} = \frac{3}{4}\pi h^2$ $3 = \frac{3}{4}\pi(12)^2 \times \frac{dh}{dt}$ $\frac{dh}{dt} = \frac{1}{36\pi}$	K1 K1 K1 N1	4	

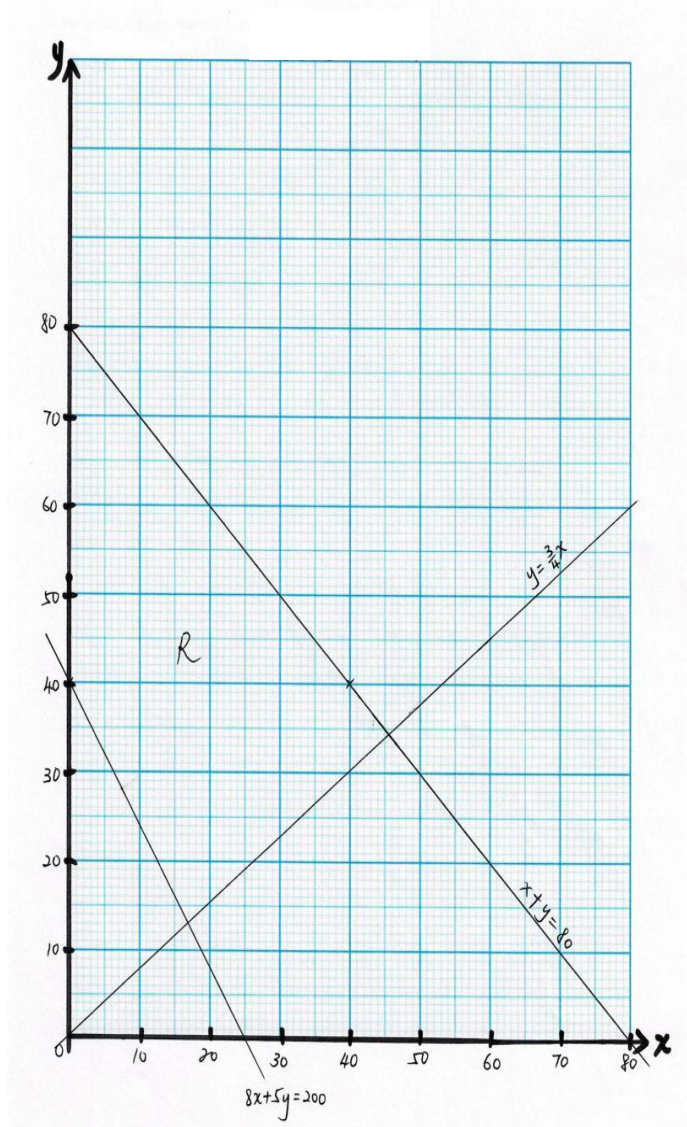
NO.	PENYELESAIAN	MARKAH		
3	(a)(i) $8\underline{x} + 2\underline{y}$	N1	2	8
	(ii) $8\underline{x} - 6\underline{y}$	N1		
	(b)(i) $\overrightarrow{PT} = h\overrightarrow{PS}$ $= h(8\underline{x} + 2\underline{y})$ $= 8h\underline{x} + 2h\underline{y}$	N1	3	
	(ii) $\overrightarrow{PT} = \overrightarrow{PQ} + \overrightarrow{QT}$ $= 6\underline{y} + k\overrightarrow{QR}$ $= 6\underline{y} + k(8\underline{x} - 6\underline{y})$ $= 8k\underline{x} + (6 - 6k)\underline{y}$	K1 N1		
	(c) $8h\underline{x} = 8k\underline{x}$ $h = k$ $2h = 6 - 6k$ $2k = 6 - 6k$ $8k = 6$ $k = \frac{3}{4} \text{ dan } h = \frac{3}{4}$	K1 K1 N1	3	
4.	(a) $\frac{6}{2}[2(2400) + (6 - 1)600]$ $= 23400$ 23400×1.05 $= 24570$	K1 K1 N1	3	7
	(b) $\frac{10}{2}[2(2400) + (10 - 1)600]$ $= 51000$ $51000 \times (1.1)^{5-1}$ $= 74699.10$ $\frac{51000 \times (1.1)^{5-1} - 51000}{51000} \times 100\% \div 15$ $= 3.094\%$	K1 K1 N1 N1	4	

NO.	PENYELESAIAN	MARKAH		
5.	(a) $\cos 30^\circ = \frac{8}{OA}$ $OA = \frac{16\sqrt{3}}{3}$	K1	1	7
	(b) (i) $\frac{16\sqrt{3}}{3} \times 1.047$ ATAU 8×1.047 $\frac{16\sqrt{3}}{3} \times 1.047 - 8 \times 1.047$ $= 1.296 \text{ cm}$ (ii) $\frac{1}{2} \times \left(\frac{16\sqrt{3}}{3}\right)^2 \times \sin 60^\circ$ ATAU $\frac{1}{2} \times (8)^2 \times 1.047$ $\left[\frac{1}{2} \times \left(\frac{16\sqrt{3}}{3}\right)^2 \times \sin 60^\circ - \frac{1}{2} \times (8)^2 \times 1.047\right] \times 6$ $= 20.68 \text{ cm}^2$	K1 K1 N1 K1 K1 N1	6	
6.	(a) $(x^2)^2 = 8x$ $x = 2$	K1 N1	2	8
	(b) $\int_0^2 (8x)^{\frac{1}{2}} dx - \int_0^2 x^2 dx$ $= \left[\frac{\sqrt{8}(x)^{\frac{3}{2}}}{\frac{3}{2}}\right]_0^2 - \left[\frac{x^3}{3}\right]_0^2$ $= \left[\frac{\sqrt{8}(2)^{\frac{3}{2}}}{\frac{3}{2}} - 0\right] - \left[\frac{2^3}{3} - 0\right]$ $= \frac{8}{3} \text{ unit}^2$	K1 K1 N1	3	
	(c) $\pi \int_0^2 (x^2)^2 dx$ $= \pi \left[\frac{x^5}{5}\right]_0^2$ $= \pi \left[\frac{2^5}{5} - 0\right]$ $= \frac{32}{5} \pi \text{ unit}^3$	K1 K1 N1	3	

NO	PENYELESAIAN						MARKAH												
9.	(a)	<table><tr><td>x</td><td>1.0</td><td>1.5</td><td>2.5</td><td>3.5</td><td>4.5</td><td>5.0</td></tr><tr><td>xy</td><td>4.00</td><td>7.50</td><td>12.75</td><td>22.05</td><td>29.25</td><td>33.00</td></tr></table>	x	1.0	1.5	2.5	3.5	4.5	5.0	xy	4.00	7.50	12.75	22.05	29.25	33.00	N1		
		x	1.0	1.5	2.5	3.5	4.5	5.0											
		xy	4.00	7.50	12.75	22.05	29.25	33.00											
				4															
		Plot paksi- xy melawan paksi- x dengan skala seragam yang betul dan satu titik diplot dengan betul.	K1																
Keenam-enam titik diplot dengan betul.	N1																		
		Garis penyuaian terbaik.	N1																

NO.	PENYELESAIAN	MARKAH		
9	(b)(i) $y - \sqrt{r} = \frac{rs}{x}$ $xy = \sqrt{r}(x) = rs$ $xy = \sqrt{r}(x) + rs$ $\sqrt{r} = \frac{33 - 4}{5.0 - 1.0}$ $r = 52.56$ $rs = -3$ $52.56s = -3$ $s = -0.057$	P1 N1	6	10
	(ii) $xy = 15$ $2.5y = 15$ $y = 6$	N1		
10.	(a) $(a) \frac{1}{2} 5(5) + 11(1) + 2(9) - 9(11) - 5(2) - 1(5) $ 30 km^2	K1 N1	2	10
	(b) $\frac{1}{2} 5(k) + 5(h) + 11(9) - 9(h) - 11(k) - 5(5) $ atau $\frac{1}{2} 5(1) + 2(k) + 9(h) - 9(2) - 1(h) - 5(k) $ atau $\frac{1}{2} 2(5) + 11(k) + 1(h) - 1(11) - 5(h) - 2(k) $ $-6k - 4h + 74 = -1 + 9k - 4h$ atau $-13 - 3k + 8h = -1 + 9k - 4h$ $15k = 75$ $k = 5$ $12h - 12k = 12$ $h - 5 = 1$ $h = 6$ Hospital R (6,5)	K1 K1 N1 N1 N1	5	

NO	PENYELESAIAN	MARKAH		
	(c) $PR = \sqrt{(6 - 5)^2 + (5 - 9)^2} = 4.123$ $QR = \sqrt{(6 - 2)^2 + (5 - 1)^2} = 5.657$ $SR = \sqrt{(11 - 6)^2 + (5 - 5)^2} = 5$ Rumah P paling dekat dengan Hospital R	K1 N1 N1	3	
11	(a)(i) $a = 400, r = 0.96$ $T_n < 300$ $400(0.96)^{n-1} < 300$ $n = 9$	P1 K1 N1	5	10
	(ii) $S_{\infty} = \frac{400}{1 - 0.96}$ $= 10\,000\text{ cm}$	K1 N1		
	(b)(i) $d = 2\pi$ $\frac{5}{2}[2a + 4(2\pi)] = 30\pi$ $a = 2\pi$	K1 K1 N1	5	
	(ii) $2\pi + (n - 1)(2\pi) = 18\pi$ $n = 9$ Bilangan topi tambahan yang dibeli adalah 4.	K1 N1		
12.	(a) $v = 6t - \frac{t^2}{2} + c$ $t = 0, v = 6(0) - \frac{(0)^2}{2} + 14$ $v = 6t - \frac{t^2}{2} + 14$ $0 = 6t - \frac{t^2}{2} + 14$ $t^2 - 12t - 28 = 0$ $(t - 14)(t + 2) = 0$ 14 s	K1 K1 K1 N1	4	10
	(b) $s = \int_0^{14} 6t - \frac{t^2}{2} + 14\,dt$ $= \left[\frac{6t^2}{2} - \frac{t^3}{2 \times 3} + 14t \right]_0^{14}$ $= \left[\frac{6(14)^2}{2} - \frac{(14)^3}{2 \times 3} + 14(14) \right] - \left[\frac{6(0)^2}{2} - \frac{(0)^3}{2 \times 3} + 14(0) \right]$ $= 326\frac{2}{3}\text{ m}$	K1 K1 N1	3	
	(c) $6 - t = 0$ $t = 6$ $v = 6(6) - \frac{(6)^2}{2} + 14$ $= 32\text{ m s}^{-1}$	K1 K1 N1	3	

NO	PENYELESAIAN	MARKAH			
13.	(a) $x + y \leq 80$ $y \geq \frac{3}{4}x$ $80x + 50y \geq 2000$	N1	3	10	
		N1			
		N1			
(b)	 Satu garis lurus dan kedua-dua paksi dilukis dengan skala yang betul. Semua garis dilukis dengan betul. Rantau R dilorek dengan tepat.	K1	3		
		N1			
		N1			
(c)	(i) 8 (ii) Titik (45, 35) daripada graf, $80(45) + 50(35)$ $= 5\,350$	N1	4		
		N1			
		K1			
		N1			

NO	PENYELESAIAN	MARKAH		
14.	(a) $\frac{1}{2}(2.6)(2.6)\sin A = 3$ $A = 62.57^\circ$ $BC^2 = 2.6^2 + 2.6^2 - 2(2.6)(2.6)\cos 62.57^\circ$ $BC = 2.7 \text{ m}$	K1 N1	2	10
	(b) $VM = \sqrt{(2.2)^2 - (1.35)^2}$ Nota: M ialah titik tengah BC $VM = 1.737 \text{ m}$ $\frac{VA}{\sin 50^\circ} = \frac{1.737}{\sin 25^\circ}$ $VA = 3.149 \text{ m}$	K1 K1 N1	3	
	(c) $2.2^2 = 3.149^2 + 2.6^2 - 2(3.149)(2.6) \cos A$ $\text{ATAU } s = \frac{2.2+3.149+2.6}{2}$ $A = 43.71^\circ$ $s = 3.975$ Luas VAB atau Luas VAC $= \frac{1}{2} \times (3.149) \times (2.6) \times \sin 43.71^\circ$ ATAU Luas VAB atau Luas VAC $= \sqrt{(3.975)(3.975 - 2.6)(3.975 - 2.2)(3.975 - 3.149)}$ Luas VAB = 2.829 m ² atau 2.831 m ² $\frac{1}{2}(h_1)(3.149) = 2.829$ atau $\frac{1}{2}(h_2)(3.149) = 2.831$ Nota: h_1 dan h_2 masing-masing ialah tinggi pada satah VAB dan VAC $h = 1.797 \text{ m}$ atau 1.798 m $\cos^{-1} \theta = \frac{1.797^2 + 1.797^2 - 2.7^2}{2(1.797)(1.797)}$ atau $\frac{1.798^2 + 1.798^2 - 2.7^2}{2(1.798)(1.798)}$ 97.38° atau 97.33°	K1 K1 K1 N1	5	

NO	PENYELESAIAN		MARKAH		
15	(a)(i)	$\frac{\text{RM}7.50}{P_{2015}} \times 100 = 118$ RM 6.36	K1 N1	5	10
	(ii)	$(145 \times 30) + (20 \times p) + (136 \times 40) + (118 \times 10)$ $\frac{(145 \times 30) + (20 \times p) + (136 \times 40) + (118 \times 10)}{100} = 137$ $p = 136.5$	K1 K1 N1		
	(b)(i)	$I_A = 145 \times \frac{125}{100} = 181.25$ $I_B = 136.5$ $I_C = 136 \times \frac{90}{100} = 122.4$ $I_D = 118$ $\bar{I} = \frac{(181.25 \times 30) + (136.5 \times 20) + (122.4 \times 40) + (118 \times 10)}{100}$ $= 123.535$	Indeks harga I_A atau I_C betul. K1 K1 N1	5	
	(ii)	$\frac{P_{2020}}{\text{RM } 1.40} \times 100 = 123.535$ $P_{2020} = \text{RM } 1.73$	K1 N1		

TAMAT PERATURAN PEMARKAHAN