

No	Skema Pemarkahan	Sub Markah	Markah
1	$x = 7 + y$ @ $y = x - 7$ @ $x = \frac{120}{y}$ @ $y = \frac{120}{x}$ Hapus satu anu Selesaikan *persamaan kuadratik - Pemfaktoran - Rumus Kuadratik - Penyempurnaan Kuasa Dua $x = 15$ DAN $x = -8$ @ $y = 8$ DAN $y = -15$ $y = 8$ DAN $y = -15$ @ $x = 15$ DAN $x = -8$	1M 1M 1M 1M 1M	5
2(a)(i) (ii) (b)	$\overrightarrow{AC} = \overrightarrow{AB} + \overrightarrow{BC}$ $\overrightarrow{AC} = \overrightarrow{AD} - \overrightarrow{AF}$ $\overrightarrow{PQ} = -2\overrightarrow{RS}$ @ $\overrightarrow{RS} = -\frac{1}{2}\overrightarrow{PQ}$ $\overrightarrow{PQ}$ dan $\overrightarrow{RS}$	1M 1M 1M 1M	4
3(a) (b)	$y = \frac{120 - x - \frac{1}{2}\pi x}{12}$ $6x \left(\frac{120 - x - \frac{1}{2}\pi x}{12} \right) - \frac{1}{2}\pi \left(\frac{x^2}{4} \right)$ $A = 60x - \frac{(4 + 3\pi)x^2}{8}$ $\frac{dA}{dx} = 0$ $60(*17.88) - \frac{(4 + 3(3.142))(*17.88)^2}{8}$ $*536.27 \times 10$ $5362.7 > 5000$ & Ya.	1M 1M 1M 1M 1M 1M 1M	7

No	Skema Pemarkahan	Sub Markah	Markah
4(a)(i)	Guna $\sin^2 \theta + \cos^2 \theta = 1$ @ $\sin 2\theta = 2 \sin \theta \cos \theta$ Kiri = Kanan	1M 1M	
(ii)	$\sin 2\theta = \frac{3}{4}$ Sudut rujukan = $48.59^\circ // 48.35'$ $24.30^\circ, 65.71^\circ, 204.30^\circ, 245.71^\circ$ $24^\circ 18', 65^\circ 43', 204^\circ 18', 245^\circ 43'$	1M 1M 1M	
(b)(i)	(a) $-4 \leq y \leq 6$ (b) $\sin x$ Dilihat $y = 5 \sin \frac{3}{2}x + 1$	1M 1M 1M	
(ii)	0, 1, 2, 4	1M	9
5(a)	$-8 \left[t^2 - 4t + \left(-\frac{4}{2} \right)^2 - \left(-\frac{4}{2} \right)^2 - 12 \right] @$ $-8 \left[t^2 - 4t + \left(-\frac{4}{2} \right)^2 - \left(-\frac{4}{2} \right)^2 \right] + 96$ $h(t) = -8(t-2)^2 + 128$ 	1M 1M	

	Bentuk $\cap$ & paksi-paksi guna alat tepi lurus	1M	
	Titik maksimum $^*(2, 128)$ & pintasan- x & pintasan- y & label paksi-paksi dan asalan	1M	
(b)	$(^*128 - 96) + ^*128$	1M	
	160	1M	
(c)	Tiada perubahan	1M	7
6(a)	$1(3^{n-1})$	1M	
	$T_n = \frac{3^n}{3}$	1M	
(b)	$a = 3$ & $r = 3$ Boleh tersirat	1M	
	$\frac{^*3(^*3^8 - 1)}{^*3 - 1}$	1M	
	9840	1M	
(c)	$r = \frac{3}{4}$	1M	
	$\frac{12}{1 - \left(\frac{3}{4}\right)^*}$	1M	
	48	1M	8
7(a)(i)	$S_{PRT} = 13(^*2.352)$	1M	
	$13(^*2.352) + ^*8 + ^*8 + 24$	1M	
	70.58	1M	

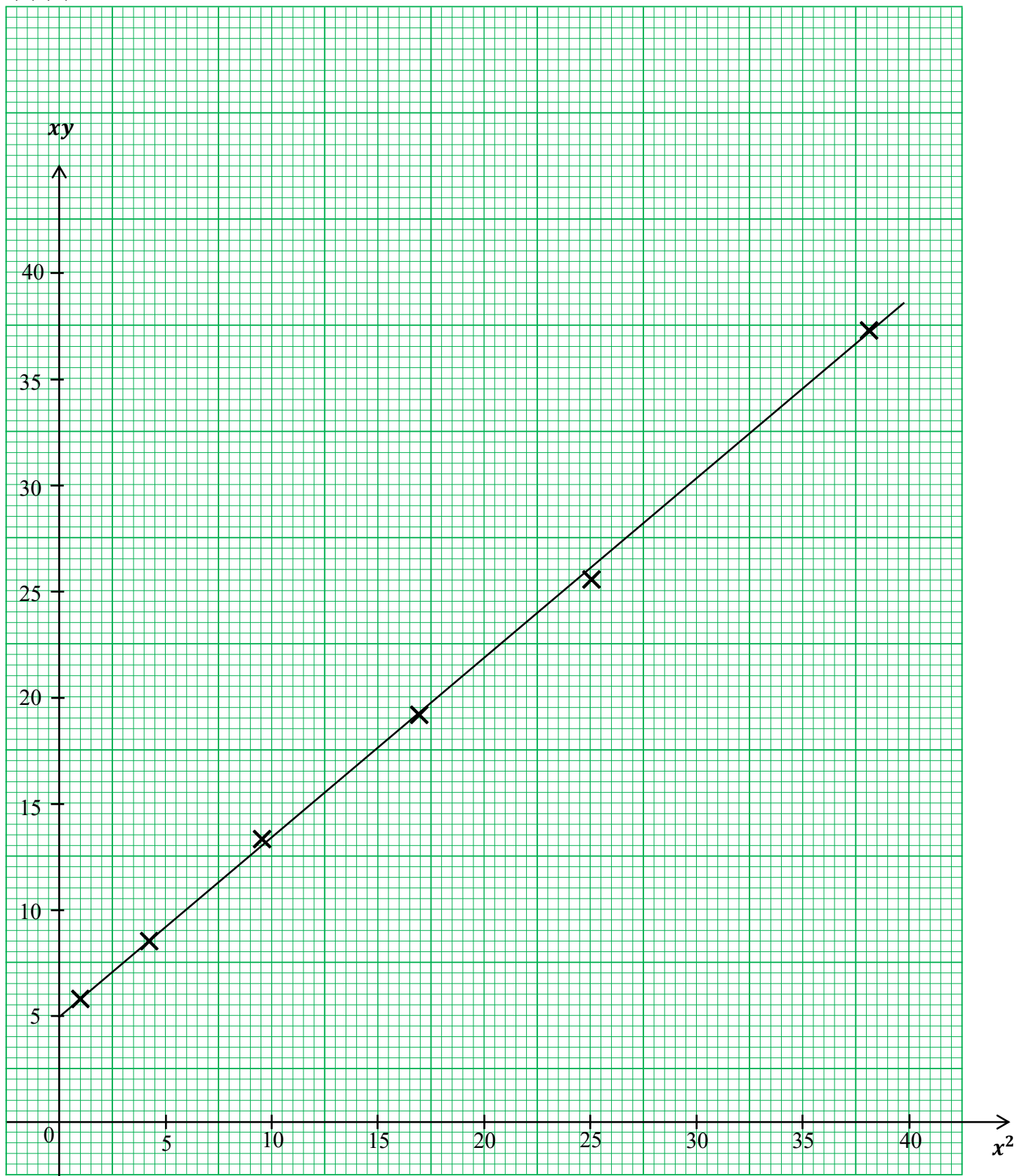
No	Skema Pemarkahan	Sub Markah	Markah
(a)(ii)	$76.66^\circ @ 26.68^\circ @$ $1.338 @ 0.4657$ $A_1 = \frac{1}{2}(6)^2 (*1.338) @$ $A_2 = \frac{1}{2}(13)^2 (*0.4657)$ $A_3 = \frac{1}{2}(6)(12.65)$ $@ \frac{1}{2}(13)^2 (\sin *26.68^\circ)$ $@ \frac{1}{2}(6)(13)(\sin *76.66^\circ)$ $*A_1 + (*A_2 - *A_3)$ $25.47 \leftrightarrow 25.50$	1M 1M 1M 1M 1M	
(b)	$\frac{L}{\theta} = \frac{\pi j^2}{2\pi}$ $L = \frac{1}{2} j^2 \theta$ Ditunjukkan	1M 1M	10
8(a)	$\frac{x-a}{c-x} = \frac{m}{n}$ $\frac{mc+na}{n+m}$	1M 1M	
(b)(i)	Guna $(x, y) = \left(\frac{nx_1 + mx_2}{m+n}, \frac{ny_1 + my_2}{m+n} \right)$ Selesaikan persamaan serentak $\frac{2a+(-6d)}{1+2} = 6 \ \& \ \frac{2(a+1)+d}{1+2} = 2 @$ $\frac{2a+c}{1+2} = 6 \ \& \ \frac{2(a+1)+\left(-\frac{c}{6}\right)}{1+2} = 2 @$ $\frac{2(b-1)+(-6d)}{1+2} = 6 \ \& \ \frac{2b+d}{1+2} = 2 @$	1M 1M 1M	

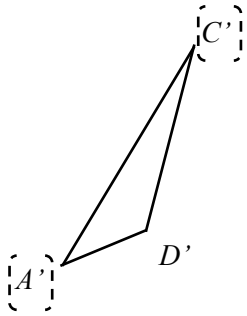
	$\frac{2(b-1)+c}{1+2}=6 \text{ \& } \frac{2b+\left(-\frac{c}{6}\right)}{1+2}=2$		
	$R(3,4) \text{ \& } T(12,-2)$	1M	
(b)(ii)	$\frac{1}{2} \left \begin{pmatrix} (*3)(*{-}2)+(*12)(0)+(*{-}2)(*4) \\ -((*4)(*12)+(*{-}2)(*{-}2)+(*3)(0)) \end{pmatrix} \right $	1M	
	33	1M	
(c)	$\left(\frac{y-4}{x-3}\right)\left(\frac{y-0}{x-(-2)}\right)=-1 \text{ @}$	1M	
	$\left(\sqrt{(x-3)^2+(y-4)^2}\right)^2+\left(\sqrt{(x-(-2))^2+(y-0)^2}\right)^2$ $=\left(\sqrt{(3-(-2))^2+(4-0)^2}\right)^2$		
	$\text{@} \sqrt{\left(x-\frac{1}{2}\right)^2+(y-2)^2}=\sqrt{\left(3-\frac{1}{2}\right)^2+(4-2)^2}$		
	$\text{@} \sqrt{\left(x-\frac{1}{2}\right)^2+(y-2)^2}=\sqrt{\left(-2-\frac{1}{2}\right)^2+(0-2)^2}$		
	$x^2+y^2-x-4y-6=0$	1M	
	$0=0 \text{ \& } \text{Ya}$	1M	10
9(a)(i)	${}^9C_r(0.4)^r(0.6)^{9-r} \text{ @ } {}^9C_r(0.6)^r(0.4)^{9-r}$	1M	
	0.01008	1M	
(ii)	$1-P(X=0)-P(X=1) \text{ @}$	1M	
	$P(X=2)+P(X=3)+\dots+P(X=9) \text{ @}$		
	$1-P(X=9)-P(X=8) \text{ @}$		
	$P(X=0)+P(X=1)+\dots+P(X=7)$		
	0.9962	1M	

No	Skema Pemarkahan	Sub Markah	Markah
(b) (i)	35 Dilihat	1M	10
	$P\left(z \geq \frac{35-40}{8}\right) @ P\left(z < \frac{50-40}{8}\right)$	1M	
	0.734	1M	
(ii)	$1 - P\left(z > \frac{50-40}{8}\right) \& 1 - ^* 0.1056$	1M	
	@ label dan lorek pada lakaran graf normal & $1 - ^* 0.1056$		
	$^*(1 - 0.1056) \times 300$	1M	
	268	1M	
10(a)(i)	$9y - \frac{y^3}{3}$	1M	
	$\left[A_1 = \right] \left[9(3) - \frac{(3)^3}{3} \right] - \left[9(0) - \frac{(0)^3}{3} \right]$	1M	
	$\left[A_2 = \right] 5 \times 2$	1M	
	$^* A_1 - ^* A_2$	1M	
	$18 - 10$		
	Nota: $A_1 > A_2$		
	8	1M	
(ii)	Kamirkan $\pi \int (9 - y^2)^2 dy$	1M	
	& Guna had $\int_1^3$ dalam $\left[81y - \frac{18y^3}{3} + \frac{y^5}{5} \right]$		
	$^* r \times \frac{1}{6}$	1M	
	$\frac{136\pi}{15}$	1M	

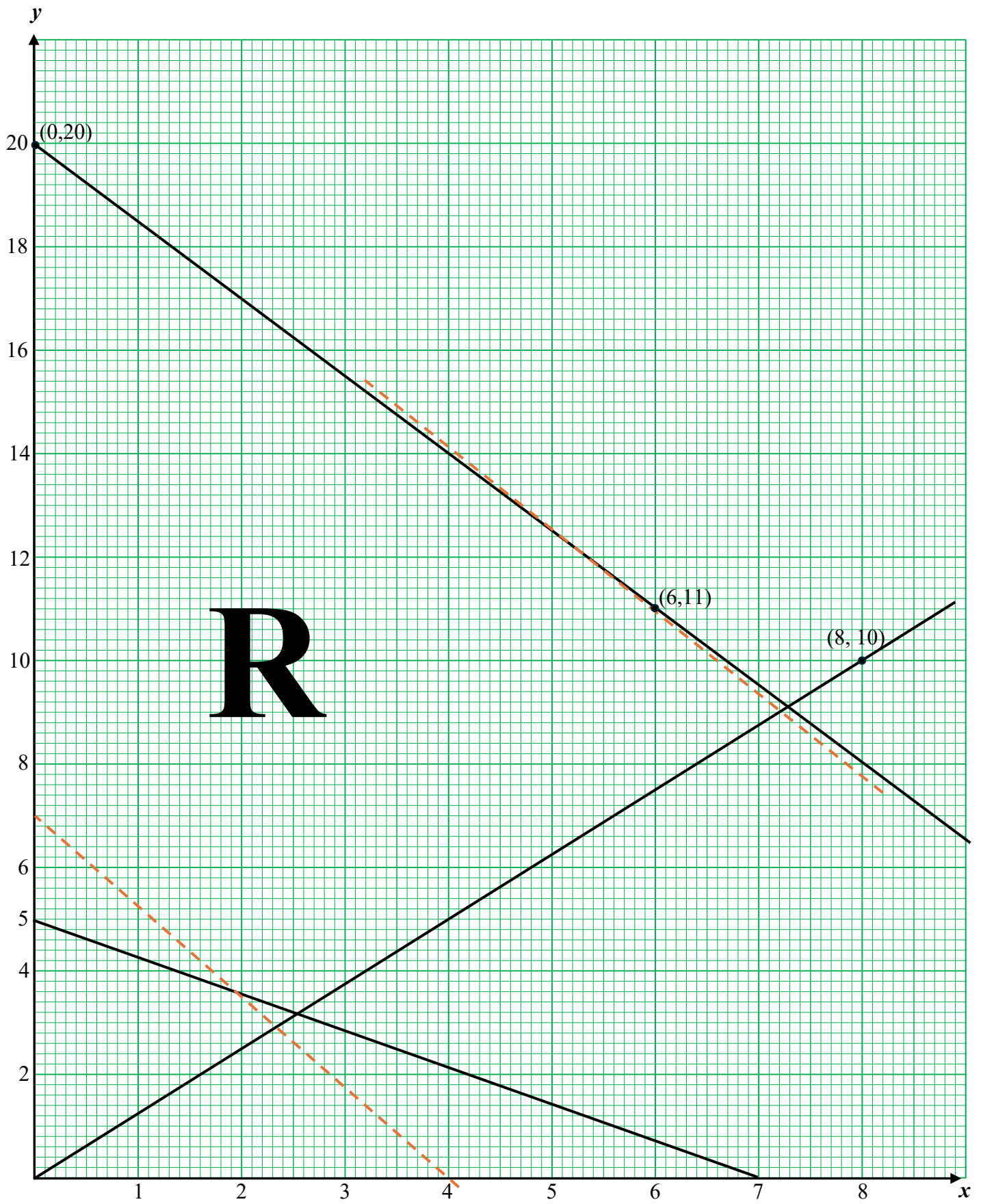
No	Skema Pemarkahan	Sub Markah	Markah							
(b)	$2b(b) @ 2 \times \pi$ $2b^2 - 2\pi$	1M 1M	10							
11(a)(i)	<table border="1"><tr><td>xy</td><td>5.9(0)</td><td>8.4(0)</td><td>12.9(0)</td><td>18.4(0)</td><td>25.5(0)</td><td>35.4(0)</td></tr></table>	xy	5.9(0)	8.4(0)	12.9(0)	18.4(0)	25.5(0)	35.4(0)	1M	
xy	5.9(0)	8.4(0)	12.9(0)	18.4(0)	25.5(0)	35.4(0)				
(ii)	Graf garis lurus xy melawan x^2 dilukis -Paksi-paksi betul dan skala seragam dari titik pertama sehingga titik terakhir -Sekurang-kurangnya satu *titik diplot betul 6 *titik diplot dengan betul Garis lurus penyuaian terbaik [Sekurang-kurangnya 5 *titik diplot]	1M 1M 1M								
(b)	$xy = px^2 + \frac{r}{p}$ Guna * $m = p$ or * $c = \frac{r}{p}$ (2 titik pada *garis) $p = 0.8429$ $r = 4.214$ Syarat: $c = 4.5 // 4.75 // 5 // 5.5$	1M 1M 1M 1M								
(c)	$\frac{y}{x} = p + \frac{r}{p} \left(\frac{1}{x^2} \right) @ \frac{y}{x} = \frac{5}{x^2} + 0.8429$ Kecerunan = 5 Pintasan-y = 0.8429	1M 1M	10							

11 (a) (ii)



No	Skema Pemarkahan	Sub Markah	Markah
12(a)(i)	$17.46^2 = 20^2 + 15^2 - 2(20)(15) \cos \angle ABD$ @ $\frac{20+15+17.46}{2} \quad \&$ $\frac{1}{2}(20)(15) \sin \angle ABD = \sqrt{26.63(*26.63-20)(*26.63-17.46)(*26.63-15)}$ 57.75°	1M 1M	
(a)(ii)	64.5° Dilihat $\frac{BC}{\sin 64.5} = \frac{15}{\sin 57.75}$ 16.01	1M 1M 1M	
(a)(iii)	$\frac{16.01+15+15}{2} \quad \&$ $\sqrt{23.005(*23.005-16.01)(*23.005-15)(*23.005-15)}$ $101.54 \leftrightarrow 101.66$	1M 1M	
(b)(i)	 NMA Nota: 1. $\angle A'D'C'$ adalah sudut cakah 2. Sisi-sisi dilakar dengan alat tepi lurus	1M	
(ii)	Guna Petua Kosinus @ Petua Sinus @ Nisbah Trigonometri untuk mencari $\angle CDA$ 133.40° Nota: $180 - \angle CDA$	1M 1M	10

No	Skema Pemarkahan	Sub Markah	Markah
13(a)	Ganti mana-mana titik integer atas garis ke dalam persamaan $45x + 30y = A$	1M	10
	10	1M	
	(b) $50x + 70y \geq 350$ atau setara NMA	1M	
	$\frac{x}{y} \leq \frac{4}{5}$ atau setara NMA	1M	
	(c) Lukis dengan betul sekurang-kurangnya satu garis lurus dari *ketaksamaan yang melibatkan x dan y	1M	
	Rantau R dilabel dengan betul	1M	
	(d) $350x + 200y = k$ Boleh tersirat. NMA	1M	
	Melukis * $350x + 200y = k$ & Ganti mana-mana titik integer dalam *rantau ke * $(350x + 200y)$	1M	
	Ganti titik (6, 11) dalam $[350x + 200y] \times 15$	1M	
	$64500 > 40000$ & Ya	1M	



No	Skema Pemarkahan	Sub Markah	Markah
14(a)	$\frac{84}{x} \times 100 = 105$ @		
	$\frac{y}{90} \times 100 = 90$ @	1M	
	$\frac{178}{160} \times 100 = z$		
	$x = 80, y = 81, z = 111.25$	2M	
(b)	$\frac{88 \times 100}{110}$ @ $\frac{242}{Q_{23}} \times 100 = 88$ & $\frac{220}{275} \times 100$	1M	
	80	1M	
(c)(i)	40 @ 20 dilihat	1M	
	$\frac{110(*40) + 105(25) + 90(15) + *111.25(*20)}{*40 + 25 + 15 + *20}$	1M	
	106	1M	
(c)(ii)	$\frac{*106 \times 115}{100}$	1M	
	21.9	1M	10

No	Skema Pemarkahan	Sub Markah	Markah
15(a)	$v = 4ht - \frac{ht^3}{3} \left[\begin{matrix} + c \\ + c \end{matrix} \right]$	1M	
	Ganti $t = 3$, $v = 12$, ke dalam v dan selesaikan untuk h	1M	
	$v = 16t - \frac{4}{3}t^3$	1M	
(b)	$s = 8t^2 - \frac{t^4}{3}$	1M	
	$16 - 4t^2 = 0$ &	1M	
	Ganti $t = 2$ ke dalam $s = 8t^2 - \frac{t^4}{3}$		
	$26\frac{2}{3} @ \frac{80}{3} @ 26.67$	1M	
(c)	$t = 3.464 // 2\sqrt{3}$	1M	
	Ganti $t = 3$ @ $t = 3.464 // 2\sqrt{3}$	1M	
	@ $t = 4$ ke dalam s		
	$2[S(3.464) - S(3)] + S(3) - S(4)$	1M	
	@ $\int_3^{2\sqrt{3}} v \, dt + \left \int_{2\sqrt{3}}^4 v \, dt \right $		
	8.333	1M	10

PERATURAN PEMARKAHAN TAMAT