PRAKTIS BESTARI

PROJEK JAWAB UNTUK JAYA (JUJ) 2016

SIJIL PELAJARAN MALAYSIA 3472/2

ADDITIONAL MATHEMATICS

Kertas 2

SET 1

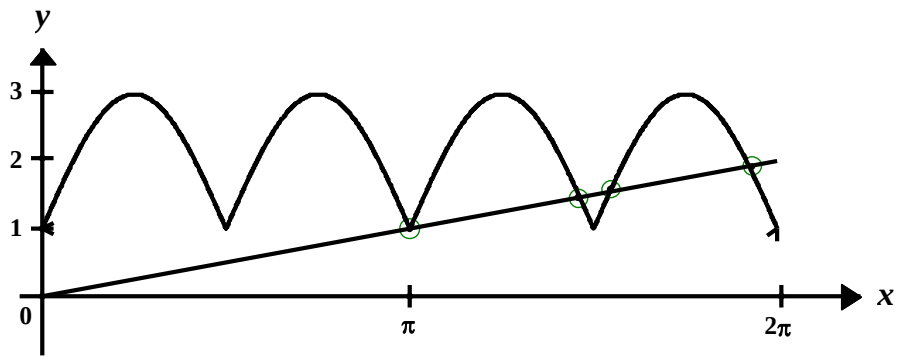
PERATURAN PEMARKAHAN

Peraturan Pemarkahan ini mengandungi 13 halaman bercetak

YAYASAN PAHANG
PAHANG STATE FOUNDATION

NO	SOLUTION	SUB MARK	TOTAL MARK
1.	$2y+x=28$ $4y^2+x^2-10x-264=0$ $x=28-2y$ OR $y=\frac{28-x}{2}$ $4y^2+(28-2y)^2-10(28-2y)-264=0$ $\quad 4\left(\frac{28-x}{2}\right)^2+x^2-10x-264=0$ $2y^2-23y+60=0$ $\quad x^2-33x+260=0$ $(2y-15)(y-4)=0$ $\quad (x-20)(x-13)=0$ $y=\frac{15}{2}, y=4$ $\quad x=20, x=13$ Length $=15$ m	1m 1m 1m 1m 1m 1m 1m	7
2.(a)	Use $y=0$ and $(1+k)^2-4(k)(k)=0$ $(3k+1)(k-1)=0$ $k=1, k=-\frac{1}{3}$	1m 1m 1m	
(b)	$y=1x^2+2x+1$ $(x+1)^2=0$ $P(-1,0)$	1m 1m	5
3.(a)	Use $\sin 2\theta=2\sin\theta\cos\theta$ or $\cos^2\theta=1-\sin^2\theta$ $\frac{1}{\cos^2\theta}-\frac{2\sin\theta\cos\theta}{\cos^2\theta}=\sec^2\theta-2\tan\theta$	1m 1m	
(b)(i)	Shape: Sinus Graph Cycle: 2 period Amplitude and modulus	1m 1m 1m	

YAYASAN PAHANG
PAHANG STATE FOUNDATION

			
(ii)	$y = \frac{x}{\pi}$ Draw straight line No of solution = 4	1m 1m 1m	8
4.(a)	$a = 1, d = 3$ and use $Sn = 376$ $\frac{n}{2}\left[2(1)+(n-1)(3)\right] = 376$ $3n^2 - n - 752 = 0$ $(n-16)(3n+47) = 0$ $n = 16$	1m 1m 1m	
(b)(i)	$a = 2, r = 2$ and use T_{25-16} $T_9 = 2(2)^8$ 512	1m 1m	
(ii)	$S_9 = \frac{2(2^9-1)}{2-1}$ $S_9 + 376$ 1398	1m 1m 1m	8

YAYASAN PAHANG
PAHANG STATE FOUNDATION

5.	Use $\overrightarrow{QT}=\overrightarrow{QP}+\overrightarrow{QT}$ and $\overrightarrow{QT}=-6\underset{\sim}{a}+3\underset{\sim}{b}$	1m	
	$\overrightarrow{QA}=-\frac{6}{p}\underset{\sim}{a}+\frac{3}{p}\underset{\sim}{b}$	1m	
	Use $\overrightarrow{QR}=\overrightarrow{QA}+\overrightarrow{AR}$: $4\underset{\sim}{b}=-\frac{6}{p}\underset{\sim}{a}+\frac{3}{p}\underset{\sim}{b}+4\underset{\sim}{a}+q\underset{\sim}{b}$	1m	
	Compare and solve: $4=\frac{3}{p}+q \quad 0=-\frac{6}{p}+4$	1m	
	$p=\frac{3}{2}$	1m	
	$q=2$	1m	6
6.(a)	$L_O=44.5$ or $F=13$	1M	
	$44.5-\left(\frac{\frac{1}{4}(80)-13}{m}\right)(5)=48$	1M	
	$m=10$	1M	
	$n=22$	1M	
	Min = $\frac{37(4)+42(9)+47(10)+52(21)+57(22)+62(11)+67(3)}{80}$	1M	
(b)	52.81	1M	6
7.(a) (i)	$M_{SR}=M_{PQ}=\frac{1}{2}$	1m	
	$\frac{0-(-1)}{k-4}=\frac{1}{2}$	1m	
	$k=6$	1m	
(ii)	$M_{PS}=-2$	1m	
	$y=-2x+7$	1m	
(iii)	Solve simultaneous equation: $y=-2x+7$ and $2y=x+1$	1m	
	$S\left(\frac{13}{5},\frac{9}{5}\right)$	1m	
(b)	$\sqrt{(x-4)^2+(y+1)^2}$ OR $\sqrt{(x-7)^2+(y-4)^2}$	1m	
	$x^2-8x+16+y^2+2y+1=x^2-14x+49+y^2-8y+16$	1m	
	$6x+10y-48=0 // 3x+5y-24=0$	1m	10

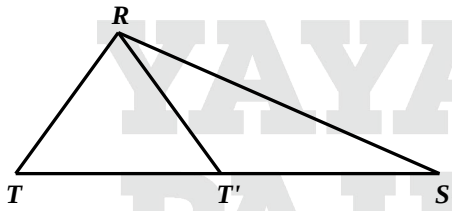
YAYASAN PAHANG
PAHANG STATE FOUNDATION

8.(a)			
	$\frac{x}{y}$ | 0.40 | 0.47 | 0.52 | 0.61 | 0.69 | 0.75	1m	
	Plot one point with scale giving	1m	
	Plot all point correctly	1m	
	Line of best fit	1m	
(b)(i)	$y = 3.78 \pm 0.1$	1m	
(ii)	$\frac{x}{y} = \frac{1}{k}(x) + h$	1m	
	Use $h = c$	1m	
	$h = 0.29 \pm 0.02$	1m	
(iii)	Use $\frac{1}{k} = m$	1m	
	$k = 17.40 \pm 2$	1m	10
9.(a)	Use $\sin\frac{\theta}{2} = \frac{4}{6}$ or $8^2 = 6^2 + 6^2 - 2(6)(6)\cos\theta$	1m	
	$\theta = 1.460$ rad	1m	
(b)	Major sector $\angle AOC = 2\pi - 1.460$	1m	
	$\cap ABC = 4(1.571)$ OR $\cap AEC = 6(2\pi - 1.460)$	1m	
	$4(1.571) + 6(2\pi - 1.460)$	1m	
	41.51 cm	1m	
(c)	Area of sector ABCD $= \frac{1}{2}(4)^2(1.571)$ or sector AOC $= \frac{1}{2}(6)^2(1.460)$	1m	
	Area of triangle AOC $= 2 \times \frac{1}{2}(4)\left(\sqrt{6^2 - 4^2}\right)$ OR $\frac{1}{2}(6)(6)\sin(83.62°)$	1m	
	$\frac{1}{2}(4)^2(1.571) - \left[\frac{1}{2}(6)^2(1.460) - 2 \times \frac{1}{2}(4)\left(\sqrt{6^2 - 4^2}\right)\right]$	1m	
	16.74 cm^2	1m	10

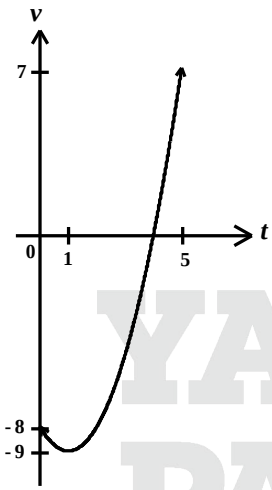
YAYASAN PAHANG
PAHANG STATE FOUNDATION

10.(a)(i)	$p=0.3 \quad q=0.7$ $n(0.3)(0.7)=105$	1m	
	$n=500$	1m	
(ii)	$q=0.3 \quad p=0.7$ Use ${}^{n}C_{r}(0.7)^{r}(0.3)^{r-1}$	1m	
	$P(X\geq 3)=P(X=3)+P(X=4)+P(X=5)P(X=6)+P(X=7)+P(X=8)$ OR $P(X\geq 3)=1-P(X=0)-P(X=1)-P(X=2)$	1m	
	0.9887	1m	
(b)(i)	$\mu=150 \quad \sigma=25$ $Z=\dfrac{180-150}{25}$	1m	
	11.51%	1m	
(ii)	$z=0.524$	1m	
	$\dfrac{t-150}{25}=0.524$ or $\dfrac{t-150}{25}=-0.524,$	1m	
	26 minit	1m	10
11.(a)	$\dfrac{dy}{dx}=4x$	1m	
	$m_T=4$, and $y-6=4(x-1)$	1m	
	$y=4x+2$	1m	
(b)	Integrate $\int_1^2(2x^2+4)\,dx=\left[\dfrac{2x^3}{3}+4x\right]_1^2$	1m	
	Use limit $\left[\left(\dfrac{2(2)^3}{3}+4(2)\right)-\left(\dfrac{2(1)^3}{3}+4(1)\right)\right]$ OR $\dfrac{1}{2}(6+10)(1)$	1m	
	$\left[\left(\dfrac{2(2)^3}{3}+4(2)\right)-\left(\dfrac{2(1)^3}{3}+4(1)\right)\right]-\dfrac{1}{2}(6+10)(1)$	1m	
	$\dfrac{2}{3}$	1m	

YAYASAN PAHANG PAHANG STATE FOUNDATION

(c)	Integrate $\pi\int_4^{10}\left(\frac{y}{2}-2\right)dy=\pi\left[\frac{y^2}{4}-2y\right]_4^{10}$	1m	
	Use limit $=\pi\left[\left(\frac{(10)^2}{4}-2(10)\right)-\left(\frac{(4)^2}{4}-2(4)\right)\right]$	1m	
	9π	1m	10
12.(a) (i)	$PQ^2=9^2+4^2-2(9)(4)\cos 40.5°$	1m	
	$PQ=6.5$ cm	1m	
(ii)	$\frac{\sin\angle PQR}{9}=\frac{\sin 40.5°}{6.5}$	1m	
	$\angle PQR=115.94°$ (obtuse)	1m	
(iii)	Area $\Delta TRS=\frac{1}{2}(4.5)(12)\sin 115.94°$	1m	
	24.28 cm^2	1m	
(b)(i)		1m	
(ii)	$TS^2=4.5^2+12^2-2(4.5)(12)\cos 115.94°$	1m	
	$TS=14.34$		
	$\frac{\sin\angle RTS}{12}=\frac{\sin\angle 115.94°}{14.34}$	1m	
	$\angle RTS=48.81°$		
	$\angle RT'S=131.19°$	1m	10

YAYASAN PAHANG
PAHANG STATE FOUNDATION

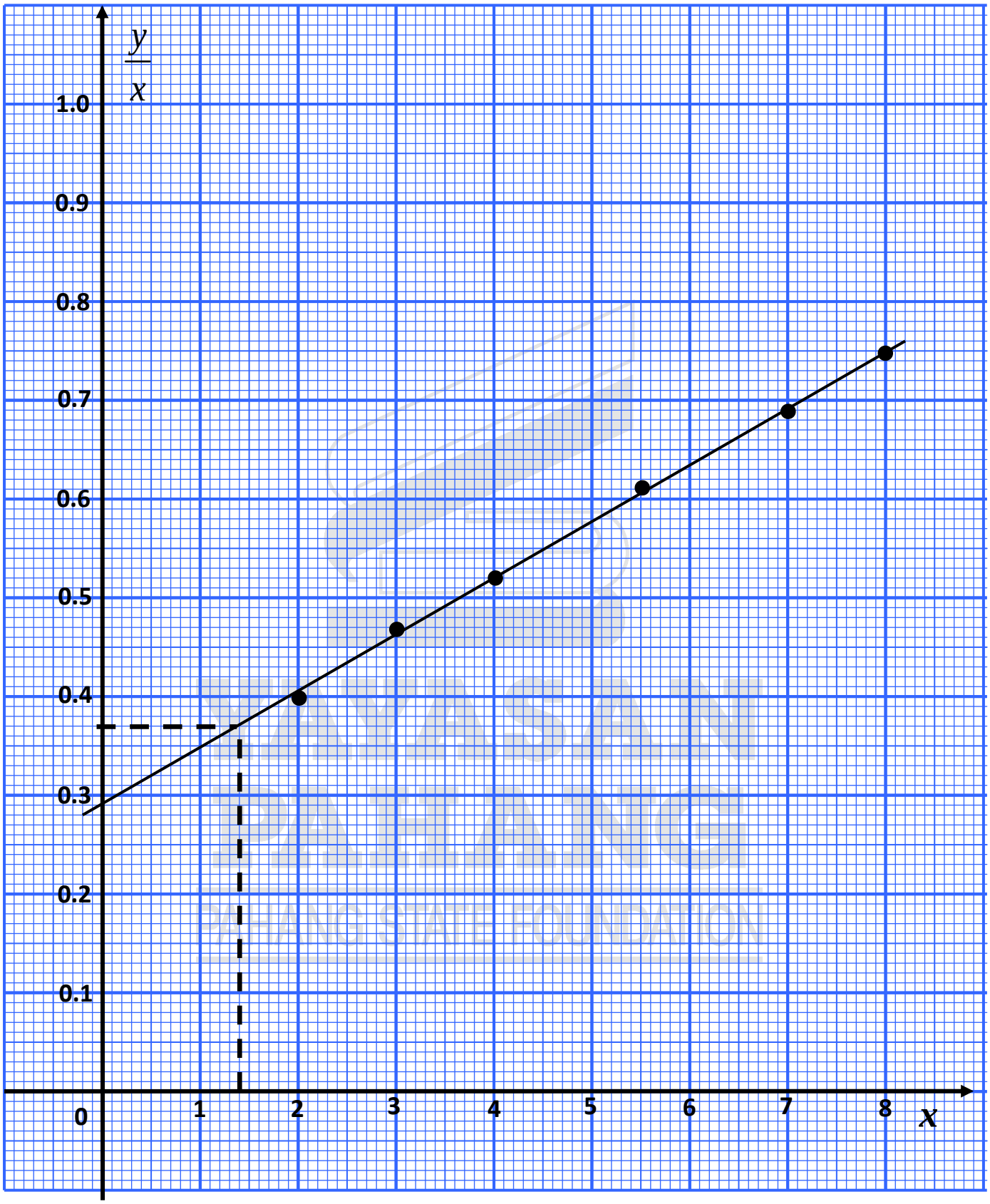
13.(a) (i)	$\frac{dv}{dt} = 2t - 2$ and use $\frac{dv}{dt} = 0$	1m	
	$v = -9 \text{ ms}^{-1}$	1m	
(ii)	Use $v < 0$ and $(t-4)(t+2) < 0$	1m	
	$0 < t < 4$	1m	
(b)	Shape from $t = 0$ until $t = 5$	1m	
	Find $v = (5)^2 - 2(5) - 8$	1m	
	Minimum point and point $(5, 7)$	1m	
			
(c)	$S = \frac{t^3}{3} - t^2 - 8t$	1m	
	$2\lvert S_4 \rvert - \lvert S_6 \rvert$	1m	
	$41\frac{1}{3}$	1m	10

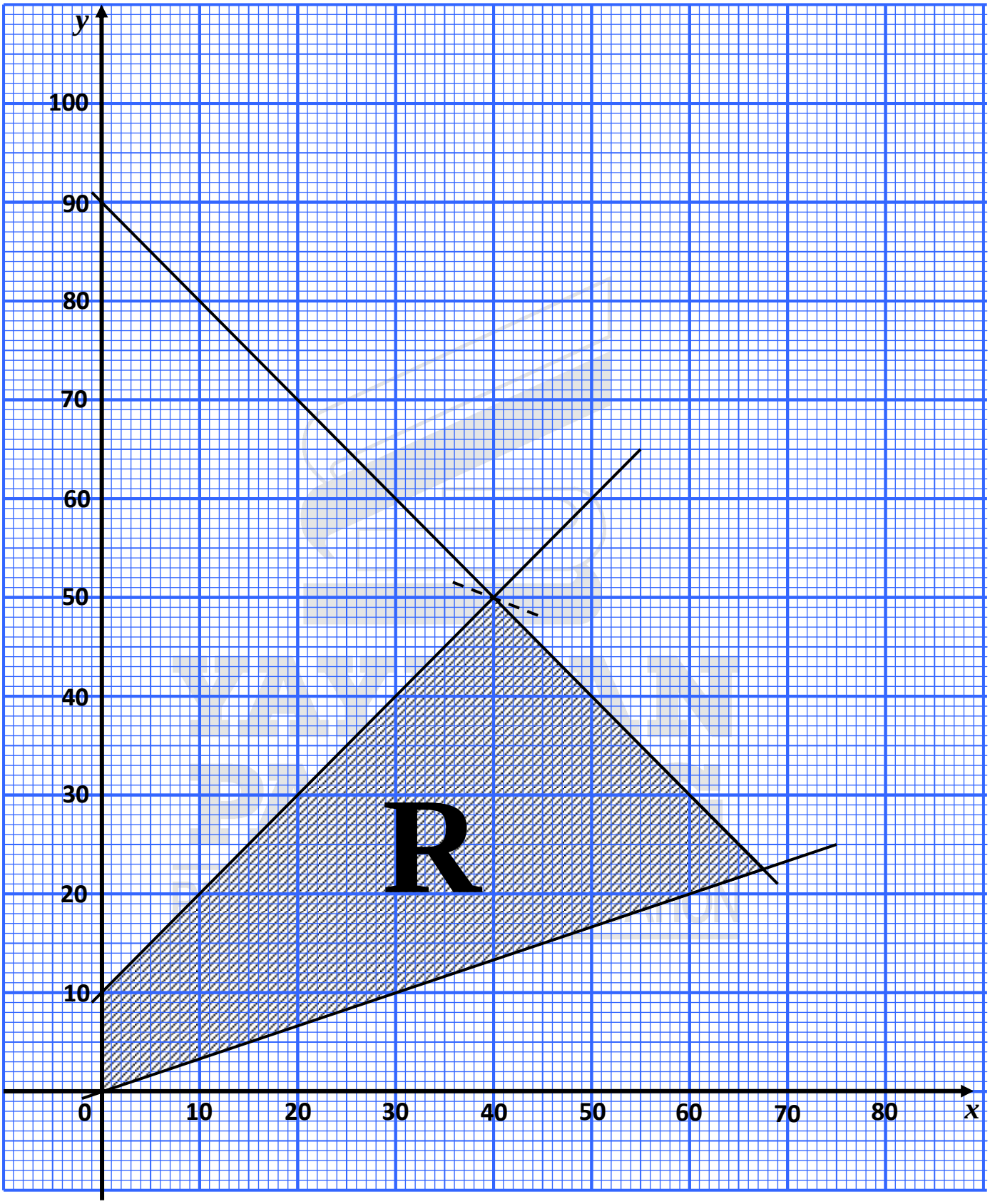
YAYASAN PAHANG
PAHANG STATE FOUNDATION

14.(a)			
	I $: x + y \le 90$	1m	
	II $: y - x \le 10$	1m	
	III $: x \le 2y$	1m	
(b)	Draw 1 line correctly	1m	
	Draw all line correctly	1m	
	Shaded and label R	1m	
(c)(i)	$5 \le x \le 45$	1m	
(ii)	Use point $(40, 50)$	1m	
	Rental $= 45(40) + 85(50)$	1m	
	RM 6050	1m	10
15.(a)	$\frac{1.20}{0.80} \times 100 = m$ OR $\frac{k}{2.50} \times 100 = 128$ OR $\frac{0.80}{h} \times 100 = 80$	1m	
	$m = 150$	1m	
	$h = 1.00$	1m	
	$k = 3.20$	1m	
(b)(i)	$\bar{I}_{14/10} = \frac{150(12) + 80(10) + 128(6) + 125(8)}{12 + 10 + 6 + 8}$	1m	
	121.33	1m	
(ii)	$\frac{P_{14}}{4325} \times 100 = 121.33$	1m	
	RM 5247.52	1m	
(c)	$\frac{121.33}{100} = \frac{\bar{I}_{15/10}}{110}$	1m	
	133.46	1m	10

YAYASAN PAHANG
PAHANG STATE FOUNDATION

Soalan 8



PAHANG STATE FOUNDATION

Soalan 14