MODUL PINTAS 2024

TINGKATAN 5

3472/2

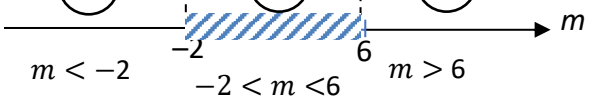
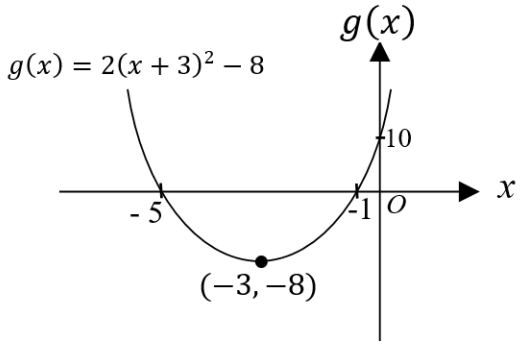
MATEMATIK TAMBAHAN
Kertas 2

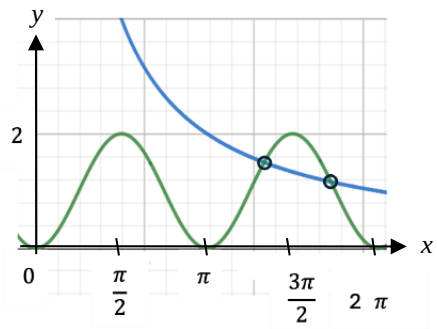
2 jam 30 minit

Dua jam tiga puluh minit

PERATURAN PEMARKAHAN MATEMATIK TAMBAHAN K2 3472/2

NO	JAWAPAN	MARKAH
	BAHAGIAN A	
1	$x^2 + y^2 = 500$ @ $4x + 2y = 100$ $y = 50 - 2x$ $x^2 + *(50 - 2x)^2 = 500$ Selesaikan * persamaan kuadratik, $x^2 - 40x + 400 = 0$ $(x - 20)^2 = 0$ @ guna formula @ penyempurnaan kuasa dua $x = 20$ $y = 10$	P1 P1 K1 K1 N1 N1
		6
2	$\log_{10} x + 2\log_{10} y = 2$ @ $3\log_{10} x - \log_{10} y = 4$ Selesaikan persamaan serentak $7\log_{10} y = 2$ @ $7\log_{10} x = 10$ $\log_{10} y = \frac{2}{7}$ @ $\log_{10} x = \frac{10}{7}$ $\log_{10}\sqrt{x} + \log_{10}\sqrt{y}$ @ $\frac{1}{2}\log_{10} xy$ $\frac{1}{2}\left(\frac{10}{7} + \frac{2}{7}\right)$ $\frac{6}{7}$	K1 K1 N1 K1 K1 N1
		6
3 a i	$f^{-1}(x)$ wujud kerana $f(x)$ ialah fungsi satu kepada satu. $f^{-1}(x)$ exists because $f(x)$ *is a one-to-one function*.	P1
3 a ii	$y^2 = 3x - 5$ $f^{-1}(x) = \frac{x^2+5}{3}, x \geq 0$	K1 N1
3 b i	$g(y) = 2\left(\frac{1}{y}\right)$ $g(x) = \frac{2}{x}, x \neq 0$	K1 N1

NO			JAWAPAN	MARKAH
		ii	$g^2(x) = \frac{2}{\frac{2}{x}}$ dan $g^3(x) = g(x) = \frac{2}{x}$ dan $g^4(x) = gg(x) = \frac{2}{\frac{2}{x}}$ 2*n* adalah sentiasa genap,n $= 1,2,3,\ldots$ $g^{2n}(x) = x$. 2*n is always even*,n $= 1,2,3,\ldots$ $g^{2n}(x) = x$.	K1 N1
				7
4	a		$(m-2)^2 - 4(1)(4) < 0$ $(m+2)(m-6) < 0$ Titik Ujian: $m = -3$, $(-3+2)(-3-6) > 0$; $m = 0$, $(0+2)(0-6) < 0$; $m = 8$, $(8+2)(8-6) > 0$  Nota: Terima semua titik ujian yang betul dalam julat yang sepadan $-2 < m < 6$	K1 K1 N1
	b	i	 Bentuk ∪ Titik minimum $(-3,-5)$, pintasan-*x* = -5, -1 dan pintasan-y = 10 dilabel pada graf. Nota: Kedua-dua paksi-*x* dan paksi-*y* mesti dilukis dengan pembaris.	P1 N1
		ii	$p < 3$ $q > -8$	P1 P1
				7

NO		JAWAPAN	MARKAH
5	a	 Bentuk graf $y = -kos\ x$ yang betul	P1
		2 kitaran dan amplitud yang betul	P1
		$y = \frac{2\pi}{x}$	P1
		Garis $y = \frac{2\pi}{x}$ dilakar dengan betul	K1
		Bilangan penyelesaian= 2	N1
	b	$\frac{1}{\tan x} + 2kos\ x = 0$ @ $\frac{\cos x}{\sin x} + 2\cos x = 0$	K1
		$\cos x\ (1 + 2\sin x) = 0$	K1
		Sudut rujukan = 90° , 30°	N1
		90°, 210°, 270°, 330°	N1
			9
6	a	$y = \frac{x^3}{3} + 2x + \frac{x^{-1}}{-1} + c$	K1
		$2 = \frac{1^3}{3} + 2(1) - \frac{1}{1} + c$	K1
		$y = \frac{x^3}{3} + 2x - \frac{1}{x} + \frac{2}{3}$	N1
	b	$\left[\frac{2x^2}{2} + 3x\right]_0^2$ @ $\frac{1}{2}(3+7)(2)$ @ $\left[\frac{x^4}{4} - \frac{x^3}{3} + 3x\right]_0^2$	K1

NO		JAWAPAN	MARKAH
		$[2^2+3(2)]-0$ @ $\left[\frac{(2)^4}{4}-\frac{(2)^3}{3}+3(2)\right]-0$	K1
		$10-\frac{22}{3}$	K1
		$\frac{8}{3}$	N1
			7
7	a	$\frac{4\underset{\sim}{i}+4\underset{\sim}{j}}{\sqrt{4^2+4^2}}$	K1
		$\frac{1}{\sqrt{2}}\underset{\sim}{i}+\frac{1}{\sqrt{2}}\underset{\sim}{j}$	N1
	b	$\overrightarrow{QS}=\overrightarrow{QP}+\overrightarrow{PS}$ @ $\overrightarrow{JR}=\overrightarrow{JS}+\overrightarrow{SR}$ @ $\overrightarrow{QK}=\overrightarrow{QP}+\overrightarrow{PS}$ @ $\overrightarrow{KS}=\overrightarrow{KJ}+\overrightarrow{JS}$	P1
		i. $-20\underset{\sim}{x}+32\underset{\sim}{y}$	N1
		ii. $25\underset{\sim}{x}$	N1
		iii. $\overrightarrow{QS}=\lambda\overrightarrow{QK}$	P1
		$-20=-5\lambda$ dan $32=8\lambda$ @ $\overrightarrow{QS}=4(-5\underset{\sim}{x}+8\underset{\sim}{y})$	K1
		$\overrightarrow{QS}=4\overrightarrow{QK}$ @ setara dan *K*, *Q* dan *S* adalah segaris.	N1
			8
BAHAGIAN B			
8	a	$\frac{(2x+x^3)(0)-11(2+3x^2)}{(2x+x^3)^2}$ @ $-11(2x+x^3)^{-2}(2+3x^2)$	K1
		$-\frac{11(2+3x^2)}{(2x+x^3)^2}$	N1
	b	$\delta y=4(x+\delta x)^2-4x^2$	K1
		$\frac{dy}{dx}=\lim_{\delta x\to 0}(8x+4(\delta x))$ dan $8x+4(0)$	K1
		$8x$	N1
	c	i $2(x-2)(x)+1(x-2)^2$	K1
		$y-1=-1(x-1)$	K1
		$y=-x+2$	N1

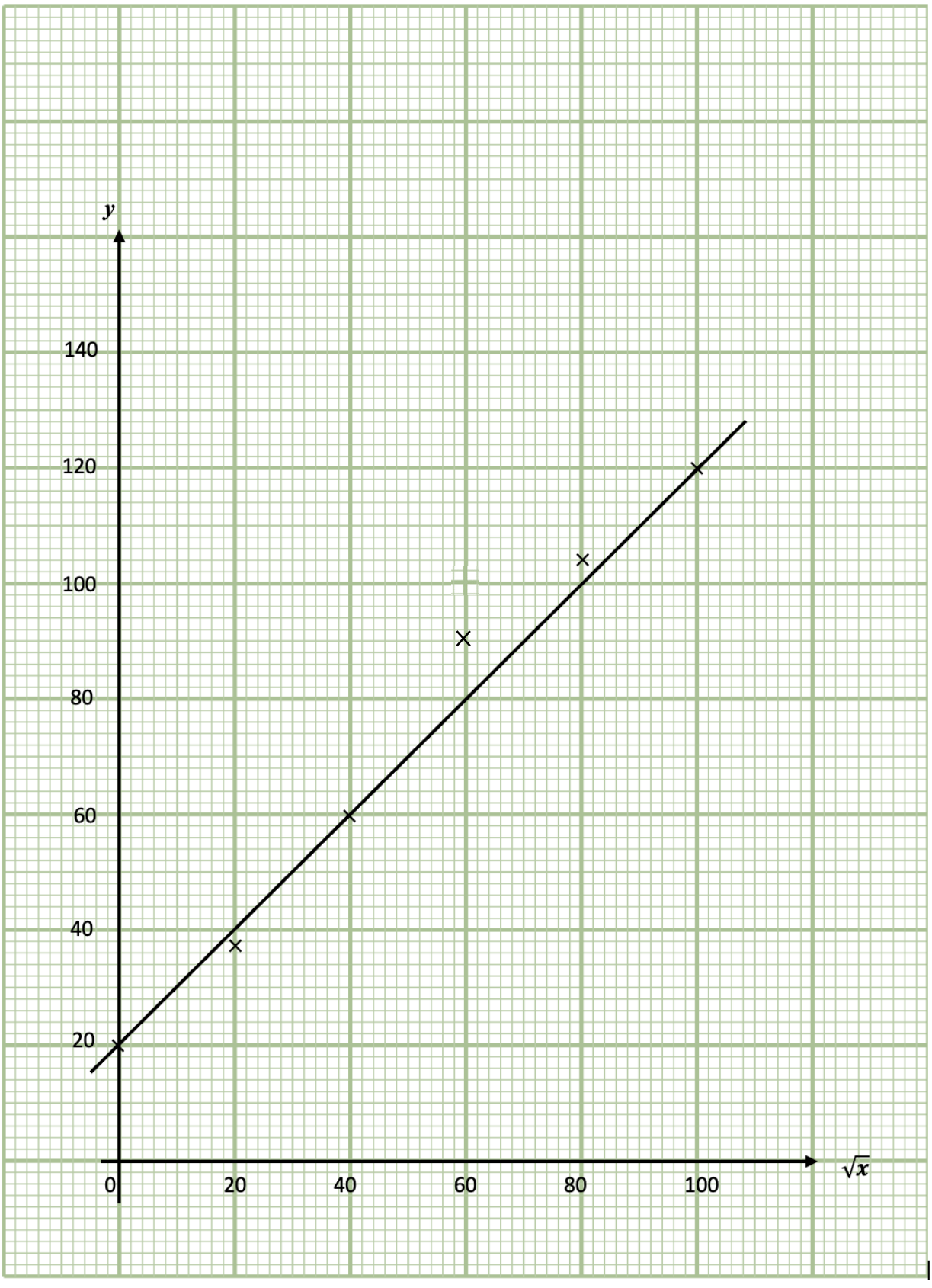
		ii	-1 x 1 = -1 , normal	K1 N1
				10
9	a		$\sqrt{(x-(-2))^2+(y-5)^2} = 4\sqrt{(x-1)^2+(y-(-1))^2}$ $5x^2+5y^2-12x+14y+1=0$	P1 N1
	b		$h = \frac{1(-2)+3(10)}{1+3}$ @ $-1 = \frac{1(5)+3k}{1+3}$ $h = 7$ @ $k = -3$ $h = 7$ dan $k = -3$	K1 N1 N1
	c		$\frac{1}{2}\|[(3)(-1)+(1)(t)+(6)(9)]-[(9)(1)+(-1)(6)+(3)(t)]\| = 28$ $-4,52$	K1 N1
	d		$m_1 = \frac{9-(-1)}{3-1}$ dan $5 \times m_2 = -1$ $y-2 = -\frac{1}{5}(x-5)$ $y = -\frac{1}{5}x+3$	K1 K1 N1
				10
10	a		$\sqrt{x}$ | 0 | 20 | 40 | 60 | 80 | 100	N1
	b		Rujuk pada graf Skala seragam yang betul dan melalui satu titik yang betul Semua titik diplot dengan betul Garis penyuaian terbaik	 K1 N1 N1
	c	i	$y = 2p\sqrt{x}+q$ $2p = * m$ @ $q = * c$ $p = 0.5 \leftrightarrow 0.52$ $q = 20 \leftrightarrow 20.1$	P1 K1 N1 N1
		ii	$y = 50$	N1
		iii	$y = 80$	N1
				10
11	a	i	$P(X=6) = {}^8C_6 \times (0.1)^6 \times (0.9)^2$ $= 0.00002268$	K1 N1
		ii	$0.15 > {}^nC_0 \times (0.1)^0 \times (0.9)^{n-0}$ $\log_{10} 0.15 > \log_{10} 0.9^n$ $n=19$	K1 K1 N1

	b	i	$P\left(Z > \frac{300-210}{35}\right)$ 0.00506	K1 N1
		ii	$P\left(Z > \frac{m-210}{35}\right) = 0.98$ $\frac{m-210}{35} = -2.054$ $m = 138.11$	K1 K1 N1
				10
BAHAGIAN C				
12	a	i	$t^2 - 6t - 7 < 0$ $0 < t < 7$	K1 N1
		ii	$2t - 6 = 0$ $3^2 - 6(3) - 7$ -16	K1 K1 N1
	b		$(t + 1)(t - 7) = 0$ $t = 7$ $s = \frac{t^3}{3} - \frac{6t^2}{2} - 7t$ $\frac{7^3}{3} - \frac{6(7)^2}{2} - 7(7)$ $81\frac{2}{3}$	K1 N1 K1 K1 N1
				10
13	a		$\frac{y}{180} \times 100 = 105$ @ $\frac{100}{x} \times 258 = 120$ @ $\frac{100}{200} \times 216 = z$ $x = 215$ @ $y = 189$ @ $z = 108$ $x = 215$ dan $y = 189$ dan $z = 108$	K1 N1 N1
	b	i	$\frac{105(5)+120(7)+108(3)}{5+7+3}$ 112.6	K1 N1
		ii	$112.6 = \frac{P}{55} \times 100$ 61.93	K1 N1
	c		$\frac{150 \times 100}{112.6}$ $133.21 = \frac{P}{60.50} \times 100$ 80.59	K1 K1 N1
				10
14	a	i	$5^2 + 9^2 - 2(5)(9)\cos 40^\circ$ 6.087	K1 N1

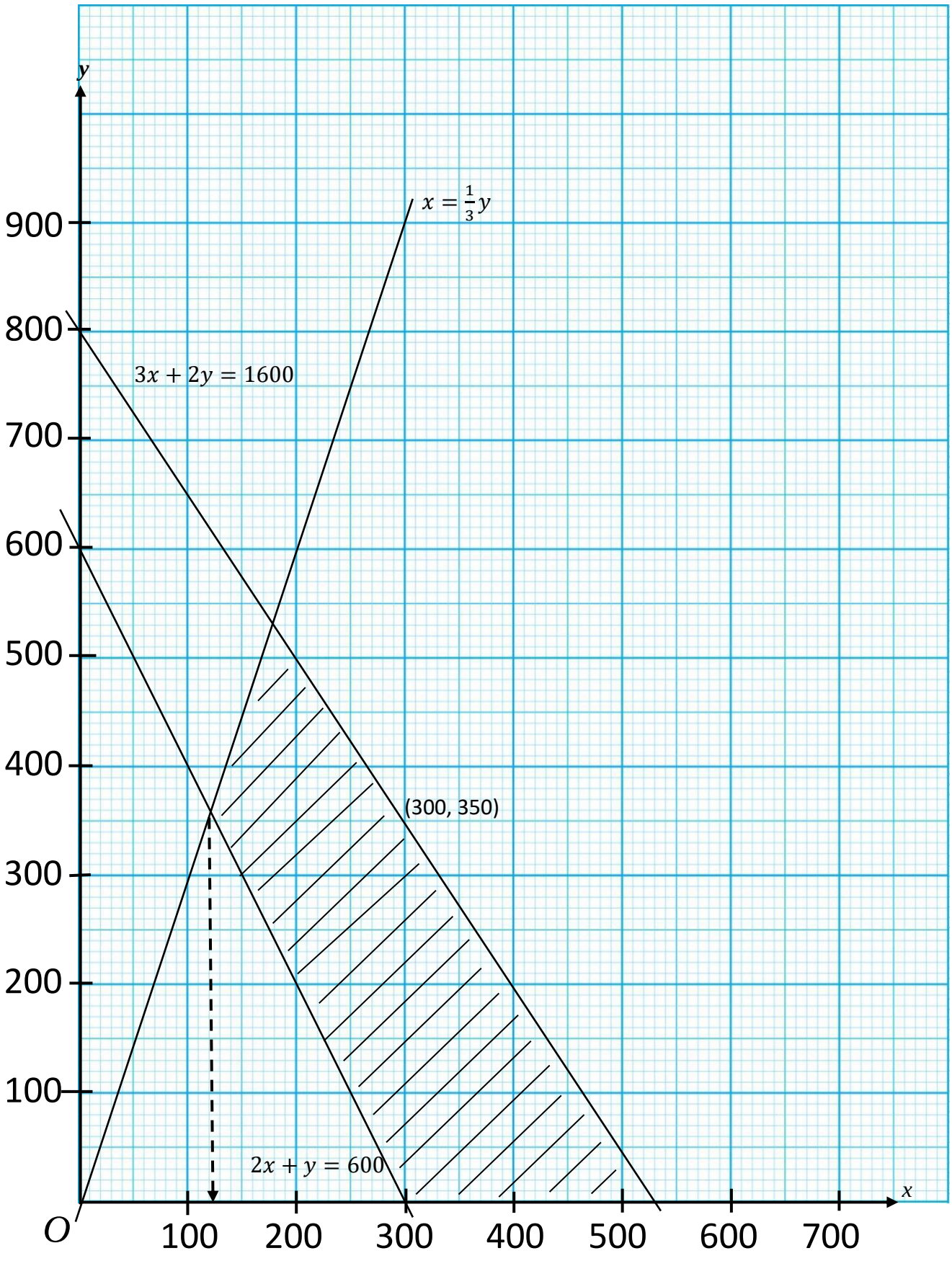
		ii	$\frac{\sin P}{9} = \frac{\sin 40^\circ}{7.8}$ 47.88°	K1 N1
		iii	$\angle PSR = 92.12^\circ$ (dilihat) $\frac{1}{2} \times 7.8 \times 9 \times \sin 92.12^\circ$ 35.08	P1 K1 N1
	b	Titik *P* kerana sisi *PR* bertentang dengan sudut terbesar. *Point P because side PR opposite to the largest angle.*		N1
	c	$\sin 92.12^\circ = \frac{x}{7.8}$ @ $\frac{1}{2}(9)(x) = 35.08$ 7.795 // 7.796		K1 N1
				10
15	a	i. $x \geq \frac{1}{3}y$ @ $y \leq 3x$ ii. $3x + 2y \leq 1600$ iii. $2x + y \geq 600$		N1 N1 N1
	b	• Lukis dengan betul sekurang-kurangnya satu garis lurus dari *ketaksamaan yang melibatkan $\boldsymbol{x}$ **dan** $\boldsymbol{y}$ pada paksi-paksi yang bermula dengan asalan. • Lukis **semua** *garis lurus dengan betul dari semua *ketaksamaan yang melibatkan x dan y (terima garisan putus- putus dan garis padu). • Rantau dilorek dengan betul.		K1 N1 N1
	c	i	120	N1
		ii	(300 , 350) **@** Dilihat 350 Max Profit = 10(300) + 5(350) = RM4750	N1 K1 N1
				10

TAMAT

Soalan 10



Soalan 15


y
x
O
$x = \frac{1}{3}y$
$3x + 2y = 1600$
$2x + y = 600$
(300, 350)
900
800
700
600
500
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300
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100
100
200
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