



**MAJLIS PENGETUA SEKOLAH MALAYSIA
NEGERI SELANGOR**

**PENILAIAN INTERVENSI TERBILANG AKADEMIK SELANGOR (PINTAS) 2025
MATEMATIK TAMBAHAN TINGKATAN 5**

Kertas 2

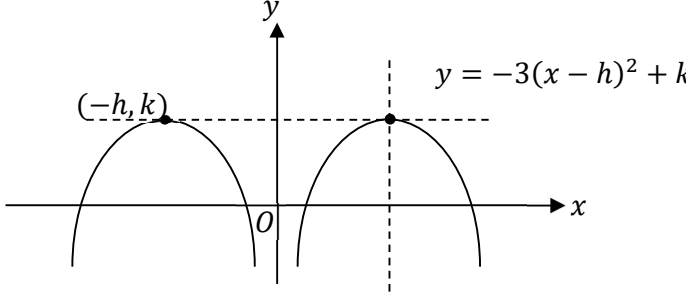
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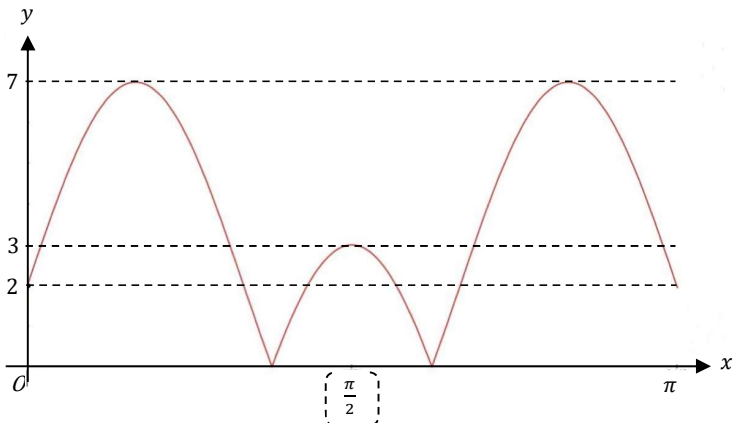
Peraturan Pemarkahan

UNTUK KEGUNAAN PEMERIKSA SAHAJA

PEPERIKSAAN PERCUBAAN SPM 2025
MATEMATIK TAMBAHAN KERTAS 2
PERATURAN PERMARKAHAN

NO SOALAN		JAWAPAN	MARKAH
BAHAGIAN A			
1		Hasil darab sebutan untuk menghapuskan satu anu OR Ungkapkan x dalam sebutan y dan z @ Ungkapkan y dalam sebutan x dan z @ Ungkapkan z dalam sebutan x dan y @ Hapus anu pertama dengan penggantian @ penghapusan (Mesti tunjuk operasi +/- semasa penghapusan) Hapus anu kedua dengan penggantian @ penghapusan (Mesti tunjuk operasi +/- semasa penghapusan) $x = -1$ @ $y = 3$ @ $z = 2$ $x = -1$ & $y = 3$ @ $y = 3$ & $z = 2$ @ $x = -1$ & $z = 2$	P1 K1 K1 N1 N1
			5
2	(a)	Surd & nombor tak nisbah @ perpuluhan tidak berulang @ mempunyai bilangan perpuluhan yang tidak terhingga <i>irrational number @ not recurring decimal @ infinite decimal places</i>	N1
	(b)	(i) $\log_a b = x$, $a^x = b$ & $\log_c a^x = \log_c b$ $\log_a b = \frac{\log_c b}{\log_c a}$ (ii) <u>Tukar asas logaritma</u> $\frac{\log_2(4x-1)^2}{\log_2 4}$ @ $\frac{\log_4 2x}{\log_4 2}$ Guna hukum $\log_a \frac{m}{n} = \log_a m - \log_a n$ @ $\log_a m^n = n \log_a m$ $\log_2 \frac{2x}{4x-1} = 1$ atau $\log_2 \frac{(2x)^2}{(4x-1)^2} = 1$ @ $2 \log_2(4x-1)$ @ $2 \log_4 2x$ @ $2 \log_4(4x-1)^2$ <u>Tukar bentuk logaritma ke bentuk indeks</u> $2 = \frac{2x}{4x-1}$ @ $4 = \left(\frac{2x}{4x-1}\right)^2$ $x = \frac{1}{3}$	P1 N1 K1 K1 K1 N1
			7

NO SOALAN			JAWAPAN	MARKAH
BAHAGIAN A				
3.	(a)	(i)	4	N1
		(ii)	$2(2x) = 1$	K1
			$x = \frac{1}{4}$	N1
	(b)	$h[\sqrt{x-4}] = x+3$ $x = u^2 + 4$ $h(x) = x^2 + 7$ 16	P1 K1 N1 N1	
				7
4.	(a)	(i)	 Nota: Parabola yang melalui $(-h, k)$	P1
		(ii)	$y_1 = -3(x+h)^2 + k$	P1
	(b)	(i)	$-2\left[x^2 - 13x + \left(\frac{-13}{2}\right)^2 - \left(\frac{-13}{2}\right)^2 + \frac{17}{2}\right]$ OR $x = -\frac{26}{2(-2)}$	K1
			$\frac{13}{2}$	N1
		(ii)	$\frac{135}{2}$	N1
	(iii)	$x = \frac{-26 \pm \sqrt{(26)^2 - 4(-2)(-17)}}{2(-2)}$ 12.31	K1 N1	
				7

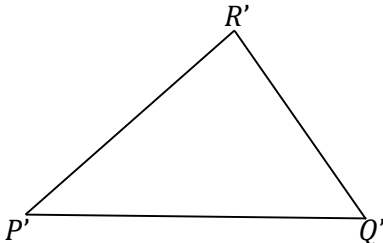
NO SOALAN		JAWAPAN	MARKAH
BAHAGIAN A			
5	(a)	Guna $\sin 2A = 2 \sin A \cos A$	K1
		$\frac{1}{2 \sin A \cos A}$ & Kiri = Kanan	N1
	(b) (i)	$-\frac{\sqrt{6}}{3}$	N1
	(ii)	$\left(-\frac{3}{5}\right)\left(-\frac{1}{\sqrt{3}}\right) - \left(-\frac{4}{5}\right) \cdot \left(-\frac{\sqrt{6}}{3}\right)$	K1
		$\frac{3\sqrt{3}-4\sqrt{6}}{15}$	N1
(c)	(i)	 Bentuk graf sinus $\frac{3}{2}$ kitaran dan anjakan 2 unit ke atas Mutlak	P1
	(ii)	$2 \leq m < 3$	N1
			9
6	(a)	Tulis hukum $\triangle OBX$, $\triangle AOB$, $\triangle OBP$, $\triangle OBY$	P1
		Guna hukum $\triangle AOB$, $\triangle OBY$ dalam sebutan $\underline{a}$ dan $\underline{b}$	K1
	(i)	$\overrightarrow{OP} = \frac{6}{5}m\underline{a} + \frac{6}{5}m\underline{b}$	N1
	(ii)	$\overrightarrow{OP} = \frac{10}{7}n\underline{a} + (3 - 3n)\underline{b}$	N1

NO SOALAN			JAWAPAN	MARKAH
	(b)		$\frac{10}{7}n = \frac{6}{5}m \quad @ \quad \frac{6}{5}m = (3 - 3n)$ Selesaikan *persamaan serentak melibatkan m dan n $m = \frac{25}{31}$ $n = \frac{21}{31}$	K1 K1 N1 N1
				8
7.	(a)		$f(x) = 5\left(\frac{x^{-1}}{-1}\right) - 2x + c$ $-1 = \frac{-5}{15} - 2(15) + c \quad \& \quad \text{cari nilai } c$ $f(x) = \frac{-5}{x} - 2x + \frac{88}{3}$	K1 K1 N1
	(b)		$\frac{1}{2} \text{ dilihat}$ $\pi \int_{-1}^{\frac{1}{2}} [(1 - 2y)^2]^2 dy$ $\pi \left[\frac{\left(1 - 2\left(\frac{1}{2}\right)\right)^5}{5(-2)} - \frac{(1 - 2(-1))^5}{5(-2)} \right]$ $24\frac{3}{10}\pi // 24.3\pi // \frac{243}{10}\pi$	P1 K1 K1 N1
				7
BAHAGIAN B				
8	(a)	(i)	$8 - x^3 = 0 \quad \& \quad p = 2$	N1
		(ii)	$\frac{d^2y}{dx^2} = -3x^2$ $-3(2)^2$ $-12 < 0 \quad \& \quad \text{Titik maksimum / Maximum point}$	K1 K1 N1
	(b)	(i)	$\frac{dV}{dr} = 4\pi r^2$ $4\pi(6)^2$ $189 = 144\pi \times \frac{dr}{dt}$ $\frac{21}{16\pi} // 0.4178$	K1 K1 K1 N1
		(ii)	$4\pi(20)^2 \times (-0.1)$ -160π	K1 N1
				10

NO SOALAN			JAWAPAN	MARKAH
9.	(a)		$\theta_1 = \theta_2$	P1
			$\tan \theta_1 = \tan \theta_2 \quad \& \quad m_1 = m_2$	N1
	(b)	(i)	$\frac{1}{2} [((-2)h + (-5)(0) + (2)(7) + k(6)) - ((6)(-5) + h(2) + 0(k) + 7(-2))] = 36$ $6k - 4h + 58 = 72 \quad @ \quad 6k - 4h + 58 = -72$ $6k - 4(3k) = 14 \quad \& \quad 6k - 4(3k) = -130$ $-\frac{7}{3} \quad \& \quad \frac{65}{3}$	K1
		(ii) (a)	Alternatif A	
			$\left(\frac{-2+2}{2}, \frac{6+0}{2}\right)$	K1
			$\sqrt{(x - *0)^2 + (y - *3)^2} = \frac{1}{2}\sqrt{(-2 - 2)^2 + (6 - 0)^2}$	K1
			$x^2 + y^2 - 6y - 4 = 0$	N1
			Alternatif B	
			$\frac{6-y}{-2-x} \quad @ \quad \frac{0-y}{2-x}$	P1
			$\frac{6-y}{-2-x} \times \frac{0-y}{2-x} = -1$	K1
			$x^2 + y^2 - 6y - 4 = 0$	N1
		(b)	$(-3)^2 + 2^2 - 6(2) - 4 = -3 \neq 0 \quad \& \quad \text{Tidak / No}$	N1
				10

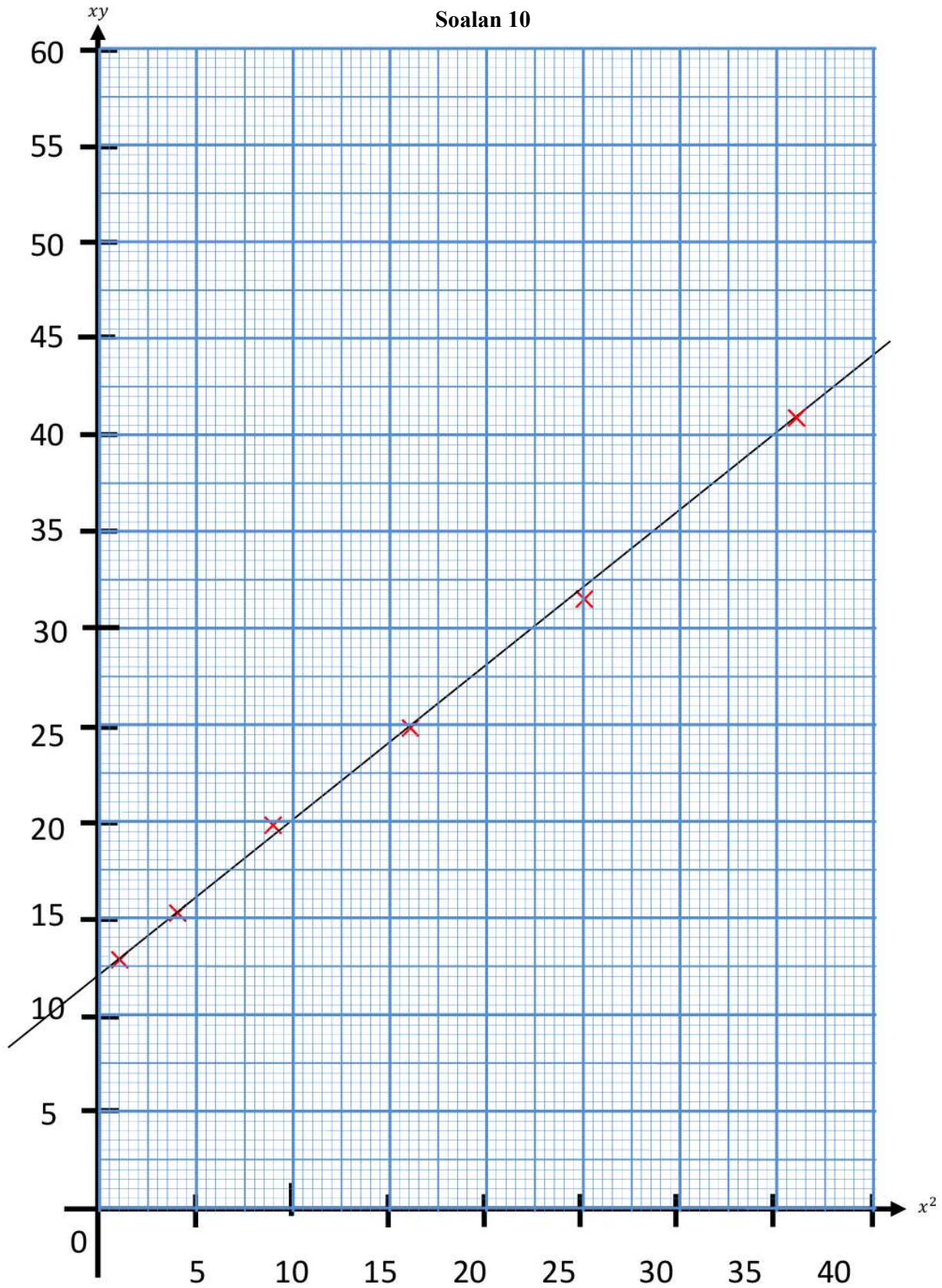
NO SOALAN			JAWAPAN							MARKAH
10	(a)		x^2	1	4	9	16	25	36	N1
		xy	12.8	15.2	19.8	24.8	31.5	40.8	N1	
	(b)		1. Graf garis lurus xy melawan x^2 dilukis - paksi-paksi betul dan skala seragam dari titik pertama hingga titik terakhir dan - sekurang-kurangnya 1 titik diplot dengan betul 2. 6 titik diplot dengan betul 3. Garis lurus penyuaian terbaik							K1 N1 N1
		(c)	(i)	$y = 6.261 \text{ // } \frac{3500}{559}$						
(ii)			Guna $m = \frac{y_2 - y_1}{x_2 - x_1}$ $m = 0.8$ $xy = \text{ *}0.8x^2 + \text{ *}12$ $y = \text{ *}0.8x + \frac{\text{ *}12}{x}$, (syarat: $11.75 \leq \text{ *}c \leq 12.25$)							K1 N1 K1 N1
								10		
	11	(a)	(i)	${}^5C_5 \times p^5 \times q^0 = 0.07776$ $p = 0.6$						
(ii)				$\text{ *}0.6 \times 5$ 3						
			(iii)	${}^5C_4 \times \text{ *}(0.6)^4 \times (0.4)^1 + 0.07776$ $0.3370 \text{ // } \frac{1053}{3125}$						
(b)					$P\left(Z < \frac{40 - 52}{30}\right)$ 0.3446 0.3446×150 51					
									10	

NO SOALAN		JAWAPAN		MARKAH
BAHAGIAN C				
12.	(a)		$0 = (3t + 4)(t - 2)$	K1
			$a = 6(2) - 2$	K1
			$a = 10$	N1
	(b)	(i)	$s = t^3 - t^2 - 8t$	K1
			$0 = 6t - 2$	K1
			$t = \frac{1}{3}$	N1
			$\left [2^3 - (2)^2 - 8(2)] - \left[\left(\frac{1}{3}\right)^3 - \left(\frac{1}{3}\right)^2 - 8\left(\frac{1}{3}\right) \right] \right $	K1
			$9\frac{7}{27} // \frac{250}{27} // 9.259$	N1
		(ii)	$ [(7)^3 - (7)^2 - 8(7)] - [2^3 - (2)^2 - 8(2)] + [2^3 - (2)^2 - 8(2)] $	K1
			262	N1
			10	
13	(a)	$\frac{110 \times 125}{100}$	K1	
		$137.5 = \frac{35}{Q_0} \times 100$	K1	
		25.45	N1	
	(b)	$\frac{110(m) + 120(30) + 125(15) + 150(15)}{m + 30 + 15 + 15}$	K1	
		$121.25 = \frac{110(m) + 120(30) + 125(15) + 150(15)}{m + 30 + 15 + 15}$	K1	
		$m = 40$	N1	
	(c)	135 dilihat	P1	
		$\frac{137.5(40) + 120(30) + 125(15) + 135(15)}{40 + 30 + 15 + 1}$	K1	
		$130 = \frac{Q_1}{80} \times 100$	K1	
		104.00	N1	
			10	

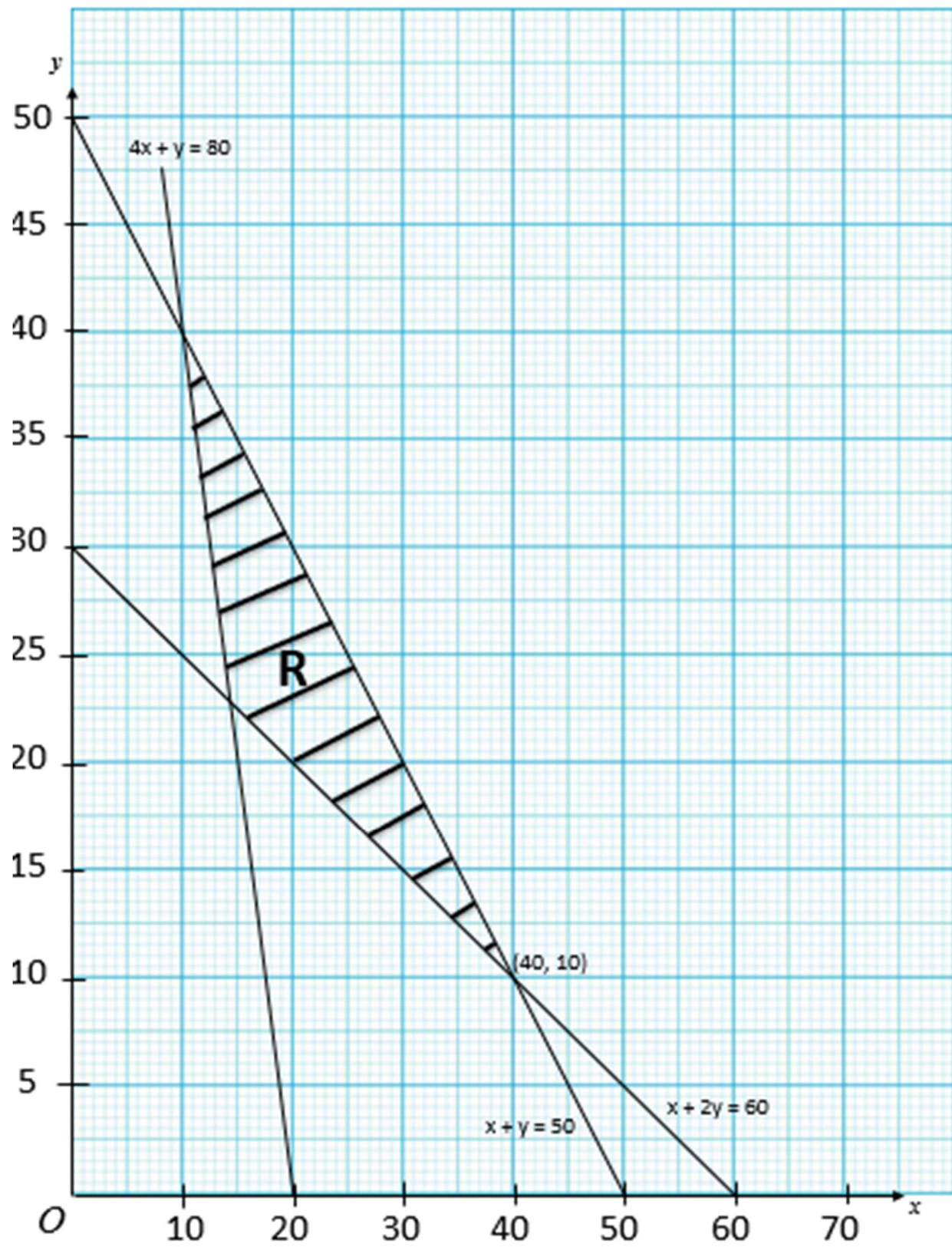
NO SOALAN			JAWAPAN	MARKAH	
14	(a)	(i)	$5^2 = 7^2 + 4^2 - 2(7)(4) \cos \angle QPR$ $44.41^\circ // 44.42^\circ$	K1 N1	
		(ii)	$\frac{PS}{\sin 44.41^\circ} = \frac{7}{\sin 110^\circ}$ $5.213 // 5.214$	K1 N1	
		(iii)	$\frac{1}{2} \times 7 \times 4 \times \sin 44.41^\circ @ \frac{1}{2} \times 5.213 \times 7 \times \sin 25.59^\circ$ $\frac{1}{2} \times 7 \times 4 \times \sin 44.41^\circ + \frac{1}{2} \times 5.213 \times 7 \times \sin 25.59^\circ$ 17.68	K1 K1 N1	
		(b)	(i)	 Nota: Label Q' mesti betul	N1
		(ii)	$\frac{\sin Q'}{7} = \frac{\sin 44.41^\circ}{5}$ $\angle P'Q'R' = 78.44^\circ // 78.49^\circ$	K1 N1	
					10
	15	(a)	$0.4x + 0.1y \geq 8$	N1	
			$0.1x + 0.2y \geq 6$	N1	
			$0.1x + 0.1y \leq 5$	N1	
		(b)	Lukis dengan betul sekurang-kurangnya satu garis lurus daripada *ketaksamaan yang melibatkan x dan y Lukis dengan betul semua *garis lurus <u>Nota:</u> Terima garis sempang dan garis padu	K1 N1	

NO SOALAN			JAWAPAN	MARKAH
			Kawasan di lorek dan label R dengan betul	N1
	(c)		(40 , 10)	N1
			Gantikan sebarang titik dalam *rantau berlorek R ke dalam $35x + 20y$	K1
			@ $*0.4x + 0.1y$	
			RM1600	N1
			17 kg	N1
				10

Soalan 10



Soalan 15



TAMAT