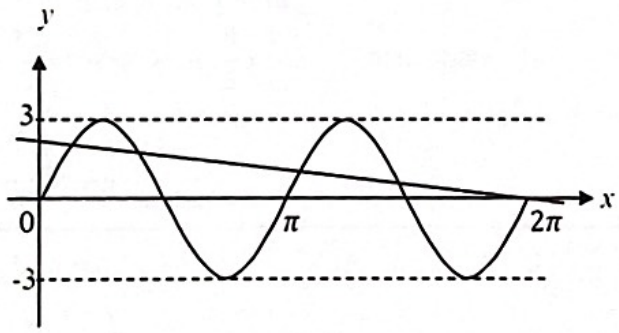
SULIT
3472/2
Matematik Tambahan
2022

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI SEMBILAN DARUL KHUSUS

PROGRAM PENINGKATAN AKADEMIK TINGKATAN 5
SEKOLAH-SEKOLAH MENENGAH NEGERI SEMBILAN 2022

PERATURAN PERMARKAHAN
MATEMATIK TAMBAHAN KERTAS 2

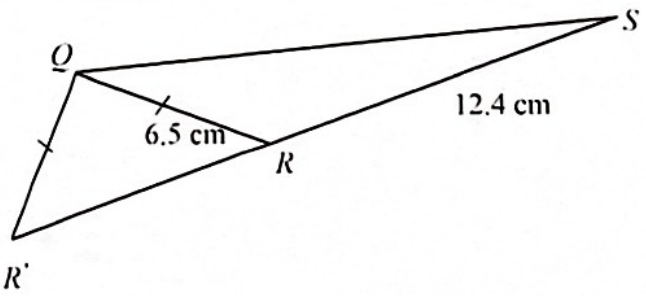
NO	PERATURAN PEMARKAHAN	MARKAH
1	$y = \frac{1-2x}{3}$ ATAU $x = \frac{1-3y}{2}$	PI
	$x^2 + 9x\left(\frac{1-2x}{3}\right) = -8$ $\left(\frac{1-3y}{2}\right)^2 + 9\left(\frac{1-3y}{2}\right)y = -8$	KI
	$(5x-8)(x+1) = 0$ $(15y+11)(y-1) = 0$	KI
	$x = \frac{8}{5}$ $dan\ x = -1$ $y = -\frac{11}{15}$ $dan\ y = 1$	NI
	$y = -\frac{11}{15}$ $dan\ y = 1$ $x = \frac{8}{5}$ $dan\ x = -1$	NI
		5 markah
2	(a) $k(x) = \sqrt{x-3}$	NI
	(b) $\left(\sqrt{x-3}\right)^2 + 3$ atau $\sqrt{(x^2+3)-3}$	KI
	$hk(x) = x$ atau $kh(x) = x$	KI
	$hk(x) = kh(x)$	NI
	(c) $B\left(\frac{13}{4}, \frac{1}{2}\right)$	PI
	$\sqrt{\left(\frac{13}{4} - \frac{1}{2}\right)^2 + \left(\frac{1}{2} - \frac{13}{4}\right)^2}$	KI
	$\frac{11\sqrt{2}}{4}$ atau 3.889	NI
		7 markah
3	(a) $\frac{1}{2}(4\sqrt{5x})(5\sqrt{5y}) - (2\sqrt{x})(3\sqrt{y})$	KI
	$\frac{1}{2}(100)\sqrt{xy} - 6\sqrt{xy}$ atau $44\sqrt{xy}$	KI
	$k = 44$	NI
	(b) $(2^t)^2(2)$	KI
	$(2^t - 8)(2(2^t) + 15) = 0$ atau setara	KI
	$2^t = 8$ or $2^t = 2^3$	KI
	$t = 3$	NI
		7 markah

4	(a)	$-\frac{1}{150}x^2 + \frac{2}{5}x = 0$	K1
		$x\left(-\frac{1}{150}x + \frac{2}{5}\right) = 0$	K1
		60 atau (60, 0)	N1
	(b)	Gantikan koordinat : $-\frac{1}{92}p^2 + q = 0$ atau $-\frac{1}{92}(46+p)^2 + q = 3$	K1
		Tukar perkara rumus : $q = \frac{1}{92}p^2$ atau setara	K1
		Gantikan dalam persamaan kedua : $-\frac{1}{92}(46+p)^2 + \frac{1}{92}p^2 = 3$ atau setara	K1
		Selesaikan p atau q : ($p = -26$)	K1
		Tinggi maksimum = 7.348 atau $\frac{169}{23}$	N1
			8 markah
5	(a)	$\frac{\sin x}{\cos x}(1 + 2\cos^2 x - 1)$	K1
		$\sin 2x$	N1
	(b) (i)	 Bentuk sin	P1
		Amplitud (maksimum = 3 dan minimum = −3)	P1
		2 kitaran	P1
	(ii)	$y = 2 - \frac{x}{\pi}$	K1
		Graf garis lurus $y = 2 - \frac{x}{\pi}$	K1
		5 bilangan penyelesaian	N1
			8 markah

6	(a)	$\int_0^2 6x - x^2 - 2x^2 dx$ atau $\left[\frac{6x^2}{2} - \frac{3x^3}{3}\right]_0^2$		K1
		$\left[\frac{6(2)^2}{2} - \frac{3(2)^3}{3}\right] - 0$		K1
		4		N1
	(b)	$\int_0^2 \pi(2x^2)^2 dx$ atau $\pi\left[\frac{4x^5}{5}\right]_0^2$		K1
		$\pi\left(\frac{4(2)^5}{5} - \frac{4(0)^5}{5}\right)$		K1
		$\frac{128}{5}\pi$		N1
				6 markah
7	(a)	$\overrightarrow{PB} = \overrightarrow{PO} + \overrightarrow{OB}$ atau $\overrightarrow{PB} = \overrightarrow{PA} + \overrightarrow{AB}$ atau $\overrightarrow{OQ} = \overrightarrow{OA} + \overrightarrow{AQ}$ atau setara		K1
		(i) $\overrightarrow{PB} = -6\underline{x} + 4\underline{y}$		N1
		(ii) $\overrightarrow{OQ} = \frac{9}{2}\underline{x} + 2\underline{y}$		N1
	(b)	$\overrightarrow{PR} = -\frac{12}{5}\underline{x} + \frac{8}{5}\underline{y}$ atau setara		K1
		Bandingkan pekali $\underline{x}$ atau $\underline{y}$:		
		$-\frac{12}{5} = -6\lambda$ atau $\frac{8}{5} = 4\lambda$ atau setara		K1
		$\lambda = \frac{2}{5}$ atau setara		K1
		$\overrightarrow{PR} = \frac{2}{5}\overrightarrow{PB}$ atau setara		N1
	(c)	$\frac{1}{2}\lvert 3\underline{x}\rvert h = 12$ ATAU	$\frac{1}{2}(3PA)h$ ATAU	$\frac{OAB}{PAB} = \frac{3}{1}$	
		$\frac{1}{2}\lvert 9\underline{x}\rvert\left(\frac{8}{\lvert\underline{x}\rvert}\right)$	3×12	$OAB = 3(12)$	K1
		36	36	36	N1
					9 markah
8	(a)	$r^2 + (h-10)^2 = 10^2$ atau $r = \sqrt{10^2 - (h-10)^2}$		K1
		$A = \pi(10^2 - (h-10)^2)$ atau $A = \pi\left(\sqrt{10^2 - (h-10)^2}\right)^2$		K1
		$A = \pi(20h - h^2)$		N1
	(b)	$\frac{dA}{dh} = 20\pi - 2\pi h$		K1
		$20\pi - 2\pi(12)$		K1
		$\frac{dA}{dt} = (20\pi - 2\pi(12)) \times 0.5$		K1
		-2π		N1

	(c)	$\delta h = \frac{p}{100} \times 12$ atau $p = \frac{\delta h}{12} \times 100$ atau setara	K1
		$\delta A = (20\pi - 2\pi(12)) \times \frac{3}{25}p$	K1
		$-\frac{12p}{25}\pi$	N1
			10 markah
9	(a)	Lihat lampiran m/s 9	5 m
	(b) (i)	$\log_{10} y = \log_{10} h + (k-2)\log_{10} x$	P1
		$k - 2 = \frac{1.65-0.63}{1.20-0.32} = 1.159$ (terima $1.147 \le m \le 1.20$) atau $\log_{10} h = 0.26$	K1
		$k = 3.159$	N1
	(ii)	$h = 1.820$	N1
	(iii)	$x = 2.951$	N1
			10 markah
10	(a) (i)	${}^{10}C_2\left(\frac{3}{5}\right)^2\left(\frac{2}{5}\right)^8$ atau ${}^{10}C_1\left(\frac{3}{5}\right)^1\left(\frac{2}{5}\right)^9$ atau ${}^{10}C_0\left(\frac{3}{5}\right)^0\left(\frac{2}{5}\right)^{10}$	K1
		$1 - \left[{}^{10}C_2\left(\frac{3}{5}\right)^2\left(\frac{2}{5}\right)^8 + {}^{10}C_1\left(\frac{3}{5}\right)^1\left(\frac{2}{5}\right)^9 + {}^{10}C_0\left(\frac{3}{5}\right)^0\left(\frac{2}{5}\right)^{10}\right]$	K1
		0.9877	N1
	(ii)	$0.6 \times 0.4 \times n = 300$	K1
		1250	N1
	(b) (i)	$\frac{30-48}{6.5}$ atau $\frac{50-48}{6.5}$	K1
		0.6181 // 0.6180	N1
	(ii)	$P(X > h) = 0.08$ atau $z = 1.406$ // 1.405	K1
		$\frac{h-48}{6.5} = 1.406$ // 1.405	K1
		57.14 // 57.13	N1
			10 markah

11	(a) (i)	$\sqrt{(-10-2h)^2+(10+3h)^2}=\sqrt{113}$	K1
		$(h+1)(13h+87)=0$	K1
		$h=-1$	N1
		$m_{SD}=\dfrac{3-(-2)}{-2-(-8)}$	K1
		$k=8$	N1
	(ii)	$m_{CS}=\dfrac{10-3}{-10-(-2)}$	K1
		$-\dfrac{7}{8}\times-\dfrac{6}{5}\neq-1$	K1
		CS bukan laluan terpendek.	N1
	(b)	$\dfrac{1(-8)+2\left(\frac{1}{2}\right)}{3}$ atau $\dfrac{1(-2)+2(-4)}{3}$	K1
		$E\left(-\dfrac{7}{3},-\dfrac{10}{3}\right)$	N1
			10 markah
12	(a)	$a_Q=-2$ atau $a_P=4t-11$	K1
		Zarah Q kerana $a_Q=-2$	N1
	(b)	$(2t-3)(t-4)<0$ dan $-2t+6<0$	K1
		$3<t<4$	N1
	(c)	$s_P=\dfrac{2}{3}t^3-\dfrac{11}{2}t^2+12t+c$	P1
		apabila $t=0$, $s_P=-6$	K1
		$s_P=\dfrac{2}{3}(3)^3-\dfrac{11}{2}(3)^2+12(3)-6$	K1
		$-\dfrac{3}{2}$	N1
	(d)	$2\left\lvert\frac{1}{2}(3)(6)\right\rvert$ atau setara	K1
		18	N1
			10 markah

13	(a)	$x = 13$	N1
		$y = 150$	N1
		$z = 4.80$ (tidak terima 4.8)	N1
	(b) (i)	$\frac{x}{62.50} \times 100 = 134$	K1
		$x = 83.75$	N1
	(ii)	$\frac{104(2) + 150(5) + 150(1) + 125w}{2 + 5 + 1 + w}$	K1
		$\frac{104(2) + 150(5) + 150(1) + 125w}{2 + 5 + 1 + w} = 134$ **dan** selesaikan w	K1
		$w = 4$	N1
	(iii)	$\frac{x}{62.50} \times 100 = 124$	K1
		$x = 77.50$ (tidak terima 77.5)	N1
			10 markah
14	(a) (i)	$QPS = 65^\circ$	P1
		$\frac{QS}{sin65^0} = \frac{9.2}{sin35^0}$	K1
		$QS = 14.54\,cm$ or $14.537cm$	N1
	(ii)	$14.54^2 = 6.5^2 + 12.4^2 - 2(6.5)(12.4)kosQRS$	K1
		$\angle QRS = 95.48^\circ$	N1
	(iii)	$\frac{1}{2}(6.5)(12.4)\sin 95.48^\circ$ atau $\frac{1}{2}(9.2)(14.54)\sin 80^\circ$	K1
		$\frac{1}{2}(6.5)(12.4)\sin 95.48^\circ + \frac{1}{2}(9.2)(14.54)\sin 80^\circ$	K1
		105.98	N1
	(b) (i)		P1
	(ii)	$QR'S = 84.52^\circ$	N1
			10 markah

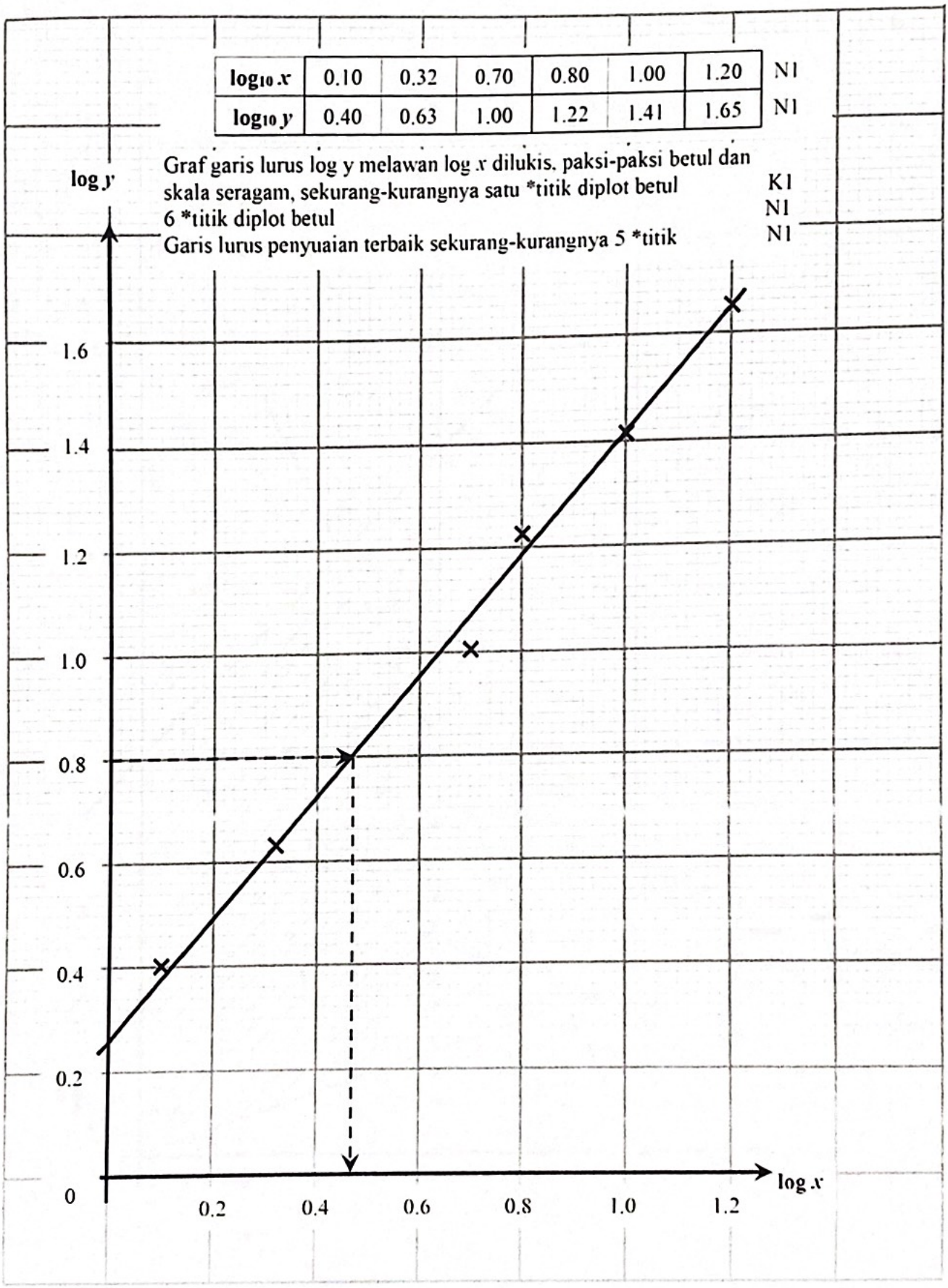
15	(a)	$y - x \leq 40$	N1
		$1000x + 500y \leq 50\,000$ atau setara	N1
	(b)	Bilangan mesin cetak P adalah tidak lebih daripada 3 kali bilangan mesin cetak Q. ATAU setara. *The number of printer P is not more than 3 times the number of printer Q. OR equivalent.*	N1
	(c)	Lihat lampiran m/s 10. Dua garis lurus dilukis betul. Rantau *R* betul.	N1N1 N1
	(d)(i)	$10 \leq y \leq 40$	N1
	(ii)	Titik maksimum (20, 60)	N1
		Keuntungan maksimum = 200(20) + 150(60)	K1
		13 000	N1
			10 markah

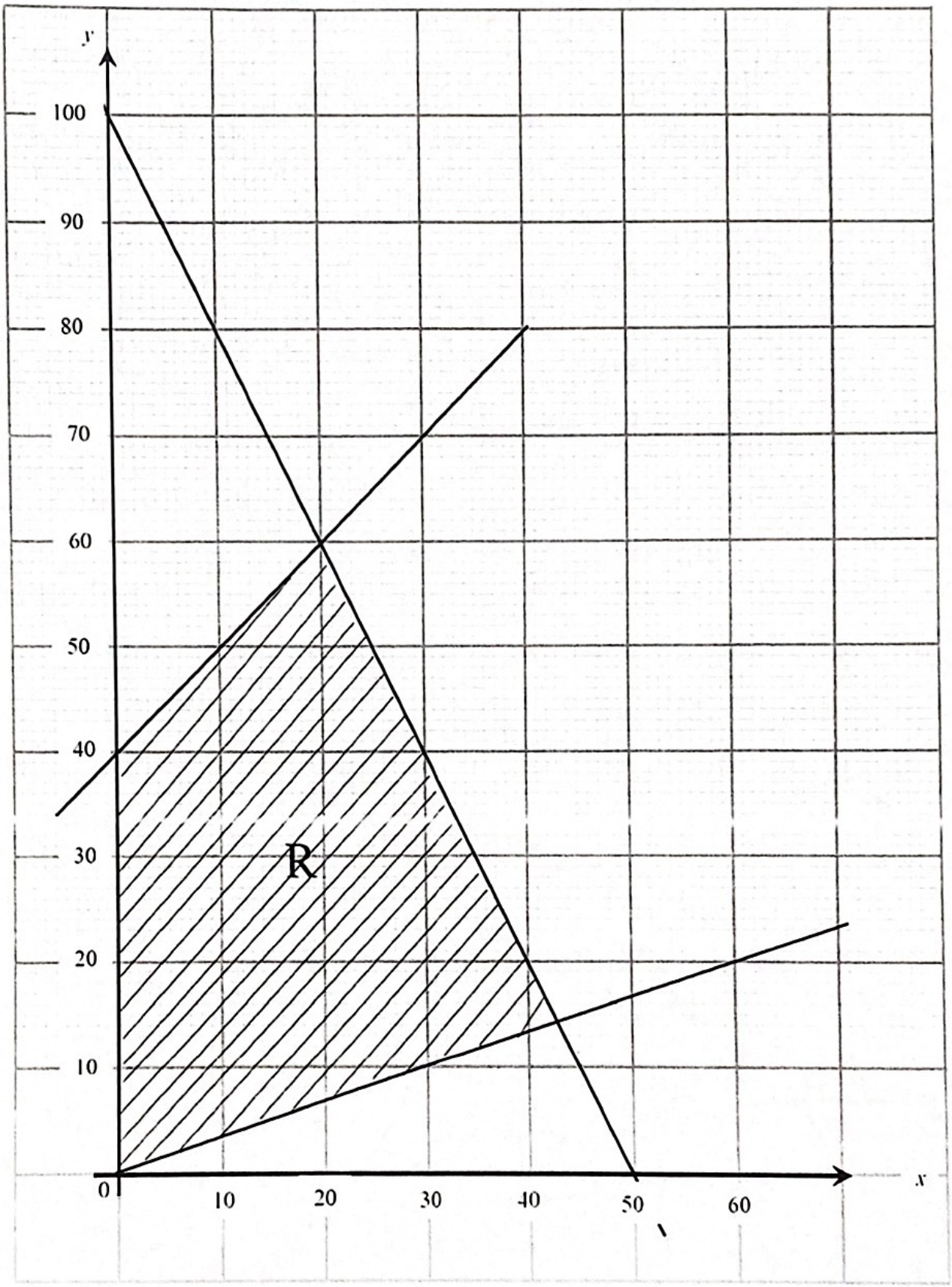
$\log_{10} x$	0.10	0.32	0.70	0.80	1.00	1.20	N1
$\log_{10} y$	0.40	0.63	1.00	1.22	1.41	1.65	N1

Graf garis lurus log y melawan log x dilukis, paksi-paksi betul dan skala seragam, sekurang-kurangnya satu *titik diplot betul K1

6 *titik diplot betul N1

Garis lurus penyuaian terbaik sekurang-kurangnya 5 *titik N1




y
100
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x
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