PROGRAM GEMPUR KECEMERLANGAN
SIJIL PELAJARAN MALAYSIA 2026
NEGERI PERLIS

SIJIL PELAJARAN MALAYSIA 2026 3472/1(PP)

MATEMATIK TAMBAHAN

Kertas 1
Peraturan Pemarkahan
Ogos

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 16 halaman bercetak

No.	Peraturan Pemarkahan		Markah	Jumlah markah
1				
(a)	$Sudut\ POR = 120°$	1m	**3**	
	$120° \times \frac{\pi}{180}$	1m		
	$= 2.095\ rad$	1m		
(b)	$s = (8)(2.095)$			
	$s = 16.76$ cm	1m		
	Perimeter Kawasan Berlorek			
	$8 + 8 + 16.76$	1m		
	$= 32.76$ cm	1m	**3**	**6**

No.	Peraturan Pemarkahan		Markah	Jumlah markah
	fitri			
2				
(a)	$(3 + 3^2 + 3^2 - 1)3^x$	1m		
	$20(3^x)$	1m	**2**	
(b)	$\left(2 + \sqrt{3}\right)(4)(x) = 20$	1m		
	$\frac{5}{(2+\sqrt{3})} \times \frac{2-\sqrt{3}}{2-\sqrt{3}}$	1m		
	$10 - 5\sqrt{3}$	1m	**3**	
				5

[*Lihat halaman sebelah*

No.	Peraturan Pemarkahan		Markah	Jumlah markah
3	$x + y + z = 49\,000$	1m	**8**	**8**
	$0.04x + 0.055y + 0.06z = 2600$	1m		
	$x = 4y$	1m		
	Hapus 1 pembolehubah	1m		
	Hapus 2 pembolehubah	1m		
	$x = 16\,000$	1m		
	$y = 4000$	1m		
	$z = 29000$	1m		

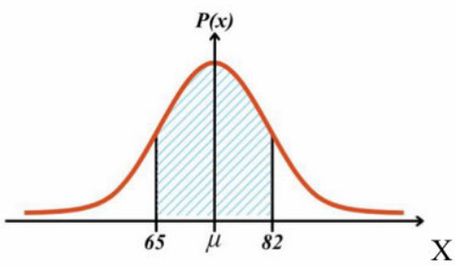
No.	Peraturan Pemarkahan		Markah	Jumlah markah
4				
(a)	$\frac{y}{x} = -2 + \frac{8}{x}$	1m		
	$Y = \frac{y}{x}$, $X = \frac{1}{x}$	1m , 1m	3	
b)	$p = 8$	1m	1	4

[*Lihat halaman sebelah*

No.	Peraturan Pemarkahan	Markah	Jumlah markah
5			
(a)	Beza $x^3 - 3x + 5$ dan samakan dengan 0		
	$3x^2 - 3 = 0$ 1m		
	$x = -1,\ x = 1$ 1m		
	Bezakan $3x^2 - 3$		
	$\frac{d^2y}{dx^2} = 6x$ 1m		
(b)	Gantikan $x = 1 \quad atau \quad x = -1$ ke dalam $\frac{d^2y}{dx^2}$		
	$6(1) \quad atau \quad 6(-1)$ 1m		
	$y = 7$ 1m		
	(-1, 7) dan titik maksimum 1m	**6**	**6**

No.	Peraturan Pemarkahan		Markah	Jumlah markah
6				
(a)	$4\int_0^3 f(x)dx - 3\int_0^3 g(x)dx$	1m		
	-18	1m	**2**	
(b)	$3\int_0^3 g(x)dx - \int_0^3 f(x)dx = \int_0^k 3x^2\,dx$	1m		
	Kamirkan $3x^2$ dan gantikan $x = k$			
	$k^3 - 0^3 = 27$	1m		
	$k = 3$	1m	**3**	
				5

[*Lihat halaman sebelah*

No.	Peraturan Pemarkahan	Markah	Jumlah markah
7	$P(65 \leq X \leq 82)$ 1m Melakar graf X  1m Cari nilai skor-Z $Z = \frac{65-70}{8} = -0.625$ atau $z = \frac{82-70}{8} = 1.5$ 1m Guna $1 - P(z > 1.5)$ & z = 0.9332 @ $1 - P(z > 0.625)$ & z = 0.2660 1m 0.6672 1m	5	5

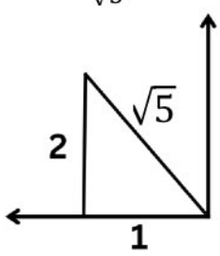
No.	Peraturan Pemarkahan		Markah	Jumlah markah
8				
(a)	(i) $6!$	1m		
	720	1m		
	(ii) ${}^{3}P_{1} \times {}^{2}P_{1} \times {}^{4}P_{4}$	1m		
	144	1m	**4**	
(b)	${}^{6}C_{3}$	1m		
	20	1m	**2**	
				6

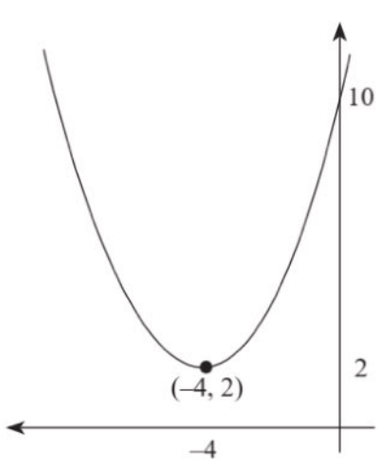
No.	Peraturan Pemarkahan	Markah	Jumlah markah
9	Cari magnitude untuk setiap pergerakan bola $\|b_1\| = \sqrt{(100)^2 + (10)^2}$ @ $\|b_2\| = \sqrt{(90)^2 + (-20)^2}$ 1m $= 100.50 - 92.20$ 1m $8.30\ m$ 1m	**3**	**3**

No.	Peraturan Pemarkahan		Markah	Jumlah markah
10				
(a)	$y = \frac{2x-3}{x+3}$	1m		
	$f(x) = \frac{3x+3}{2-x}$	1m	2	
(b)	$x = 2$	1m	1	3

[*Lihat halaman sebelah*

No.	Peraturan Pemarkahan		Markah	Jumlah markah
11				
(a)	$m_{BC} \times -\frac{4}{3} = -1$	1m		
	$\frac{y-0}{x-3} = \frac{3}{4}$	1m		
	$4y = 3x - 9$ atau setara	1m	**3**	
(b)	$\left(0, -\frac{9}{4}\right)$	1m		
	$\frac{2(0)+1(x)}{2+1} = 3$ atau $\frac{2\left(-\frac{9}{4}\right)+1(y)}{2+1} = 0$	1m		
	$C\ (9, \frac{9}{2})$	1m	**3**	
				6

No.	Peraturan Pemarkahan	Markah	Jumlah markah
12			
(a)	$\sin\theta = \frac{2}{\sqrt{5}}$ atau  1m		
	$\tan\theta = 2$ 1m		
	Guna $\tan 2\theta = \frac{2+\tan\theta}{1+\tan^2\theta}$ 1m		
	$\frac{4}{5}$ 1m	4	
(b)	$\sin x\left(2kosx + \sqrt{3}\right) = 0$ 1m $\sin\theta = 0$, $x = 180°$ @ kos $\theta = -\frac{\sqrt{3}}{2}$, $x = 150°,\ 210°$ 1m		
	$x = 150°, 180°, 210°$ 1m	3	
			7

No.	Peraturan Pemarkahan		Markah	Jumlah markah
13				
(a)	$p[x^2+\frac{4}{p}x+\left(\frac{\frac{4}{p}}{2}\right)^2-\left(\frac{\frac{4}{p}}{2}\right)^2+\frac{q}{p}]$	1m		
	$p(x+\frac{2}{p})^2-\frac{4p}{p^2}+\frac{pq}{p}$	1m		
	$p(x+\frac{2}{p})^2+\frac{pq-4}{p}$	1m	**3**	
(b)	$-\frac{2}{p}=-4$ dan $\frac{pq-4}{p}=2$	1m		
	$p=\frac{1}{2}$ dan $q=10$	1m	**2**	
(c)				
	- Bentuk graf kuadratik minimum - Titik minimum (-4, 2) - Pintasan-y =10	1m 1m 1m	**3**	
				8

No.	Peraturan Pemarkahan	Markah	Jumlah markah
14			
(a)	$\frac{dy}{dx} = 5 + 2x$ 1m Ganti $x = 4$ ke dalam $\frac{dy}{dx}$ 1m 13 1m	**3**	
(b)	$\delta x = 0.01$ 1m Guna $\delta y = \frac{dy}{dx} \times \delta x$ 1m 13×0.01 0.13 1m	**3**	
(c)	Guna $\frac{dy}{dt} = \frac{dy}{dx} \times \frac{dx}{dt}$ 1m 13×0.4 5.2 1m	**2**	
			8

[*Lihat halaman sebelah*

No.	Peraturan Pemarkahan	Markah	Jumlah markah
15	$S_n = a + ar + ar^2 + ar^3 + \cdots + ar^{n-1}$ - (1) 1m		
(a)	Persamaan $(1) \times r$		
	$rS_n = ar + ar^2 + ar^3 + ar^4 \cdots + ar^n$ -(2) 1m		
	Persamaan (1) – (2)		
	$S_n - rS_n = a - ar^n$ *atau* $S_n(1-r) = a(1-r^n)$ 1m		
	$S_n = \frac{a(1-r^n)}{1-r}$ 1m	**4**	
(b)	a =3 atau r = 6 1m		
	$\frac{3(1-6^n)}{1-6} = 167,961$ 1m		
	$n = \frac{\log_{10} 279\,936}{\log_{10} 6}$ 1m		
	n = 7 1m	**4**	**8**

PROGRAM GEMPUR KECEMERLANGAN
SIJIL PELAJARAN MALAYSIA 2026
NEGERI PERLIS

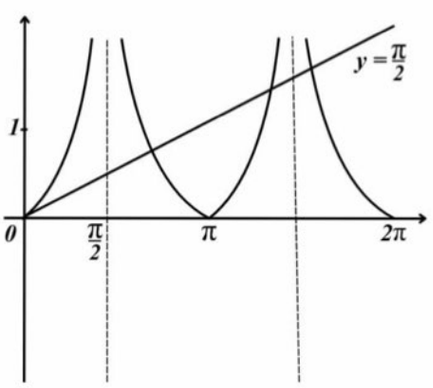
SIJIL PELAJARAN MALAYSIA 2026 3472/2(PP)

MATEMATIK TAMBAHAN
Kertas 2
Peraturan Pemarkahan
OGOS

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 18 halaman bercetak

No.	Peraturan Permarkahan	Markah	Jumlah Markah
1			
(a)	$5a + b = 21$ @ $3a + b = 3$ @ $\frac{36}{c-21} = -4$ 1m $2a = 18$ & $b = -24$ 1m $a = 9$ 1m $c = 12$ 1m	4	
(b)	$f(x) = 9x - 24$ atau $g(x) = \frac{36}{12-x}$ 1m $gf(x) = \frac{36}{12-(9x-24)}$ 1m $\frac{36}{36-9x}$ @ $\frac{4}{4-x}$ 1m $\frac{36}{36-9x} = x$ @ $\frac{4}{4-x} = x$ 1m $x = 2$ 1m	5	9

No.	Peraturan Permarkahan	Markah	Jumlah Markah
2	$\frac{(Sekx+\tan x)-(sekx-tanx)}{sek^2x-tan^2x}$ 1m		
(a)	dan guna $sek^2x = 1 + tan^2x$		
	$2tanx$ 1m	2	
(b)			
(c)	Bentuk graf tangen 1m		
	1 kalaan $0 \leq x \leq 2\pi$ 1m		
	Modulus 1m	3	
	$y = \frac{x}{\pi}$ dan lukis garis lurus 1m		
	Bilangan penyelesaian =4 1m	2	
			7

No.	Peraturan Permarkahan	Markah	Jumlah Markah
3			
(a)	$B40° \times \frac{\pi}{180}$ 1m $= 0.6981\ rad$ $s = (11)(0.6981)$ 1m $s = 42.24\ cm$ 1m	3	
(b)	$\frac{1}{2} \times 11^2 \times 0.6981$ 1m $42.24\ cm^2$ 1m	2	
(c)	*Isipadu tembikai* 1m 42.42×8 $339.36\ cm^3$ 1m	2	7

No.	Peraturan Permarkahan	Markah	Jumlah Markah
4	$y = x - 2$ .....(1) $y = x^2 - 8x + 12$ .....(2) Gantikan (1) ke dalam (2) : *Substitute (1) into (2) :* $x - 2 = x^2 - 8x + 12$ $x^2 - 9x + 14 = 0$ $(x - 7)(x - 2) = 0$ $x = 7$ atau / or $x = 2$ Gantikan nilai – nilai x ke dalam (1): *Substitute the values of x into (1):* Apabila / *When* $x = 7$ atau / *or* Apabila / *When* $x = 2$ $y = 7 - 2$ $y = 2 - 2$ $y = 5$ $y = 0$ Maka, R(2,0) dan S(7,5). *Hence*, R(2,0) *and* S(7,5).	**6**	**6**

[*Lihat halaman sebelah*

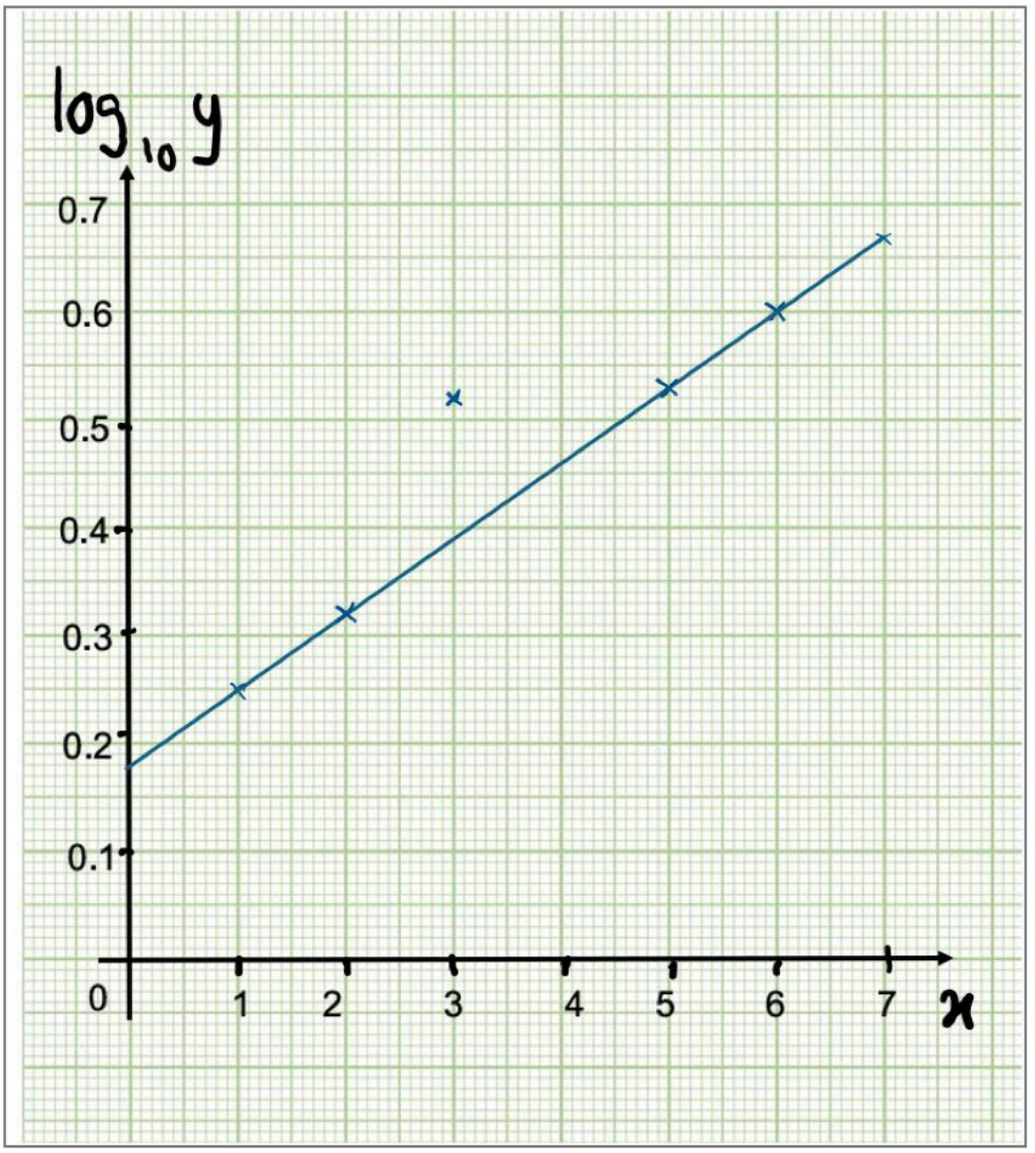
No.	Peraturan Permarkahan	Markah	Jumlah Markah
5			
(a)	$x + 17 - 50 = 25 + y - (x + 17)$ *atau setara* 1m $y = 2x - 41$ 1m	**2**	
(b)	$d = 7$ 1m $T_{21} = a + (21 - 1)(7) = 155$ 1m $a = 15$ 1m	**3**	
			5

No.	Peraturan Permarkahan	Markah	Jumlah Markah
6 (a)	$2^n 3^n (2 \times 2 \times 3)^m = 2^{3n-m} 3^{3n-2m}$ 1m $2^{2m+n} 3^{n+m} = 2^{3n-m} 3^{3n-2m}$ $2m + n = 3n - m$ atau $n + m = 3n - 2m$ 1m $3m = 2n$ 1m $\frac{m}{n} = \frac{2}{3}$ $m : n = 2 : 3$ 1m	4	
(b)	$y = mx + 3$ $7 = m\left(1 + \sqrt{5}\right) + 3$ $m = \frac{4}{1+\sqrt{5}} \times \frac{1-\sqrt{5}}{1-\sqrt{5}}$ 1m $-1 + \sqrt{5}$ 1m	2	
(c)	$\log_3 h - 3 \log_{27} k = 1$ $\log_3 h - 3 \frac{\log_3 k}{\log_3 27} = 1$ 1m $\log_3 h - \frac{3 \log_3 k}{3} = 1$ $\log_3 h - \log_3 k = 1$ $\log_3 \frac{h}{k} = 1$ 1m $h = 3k$ 1m	3	9

No.	Peraturan Permarkahan	Markah	Jumlah Markah
7 **(a)**	Guna Hukum Segitiga untuk *OS* atau *QP* *(i)* $\overrightarrow{OS} = 6\underline{x} + 2\underline{y}$ *(ii)* $\overrightarrow{QP} = -\overrightarrow{OQ} + \overrightarrow{OP}$ atau $\overrightarrow{QP} = \overrightarrow{QO} + \overrightarrow{OP}$ $\overrightarrow{QP} = 6\underline{x} - 8\underline{y}$	**3**	
(b)	*(i)* $\overrightarrow{OR} = m(6\underline{x} + 2\underline{y})$ $= 6m\underline{x} + 2m\underline{y}$	**2**	
	(ii) $\overrightarrow{OR} = \overrightarrow{OQ} + \overrightarrow{QR}$ $= 8y + n(6\underline{x} - 8y)$ $= 8y + 6n\underline{x} - 8ny$ $6n\underline{x} + (8 - 8n)\underline{y}$	**2**	**7**

No.	Peraturan Permarkahan	Markah	Jumlah Markah
8			
(a)			
	$\log_{10} y$ | 0.25 | 0.32 | 0.52 | 0.53 | 0.60 | 0.67 1m	1	
(b)	1 titik di plot betul 1m 6 titik di plot betul 1m **Tiada 0.7 pada paksi $\log_{10} y$ 0 markah** Line best fit 1m	3	
(c)	$\log_{10} y = 3x \log_{10} q + \log_{10} p$ 1m $0.17 \leq \log_{10} p \leq 0.18$ atau $3\log_{10} q = \frac{0.6-0.18}{6-0}$ $(atau\ setara)$ 1m $1.479 \leq p \leq 1.549$ 1m $1.057 \leq q \leq 1.054$ 1m $0.38 \leq \log_{10} y \leq 0.40$ $1m$ $2.399 \leq y \leq 2.512$ 1m	6	10

Graf soalan **8**(*b*)



No.	Peraturan Permarkahan	Markah	Jumlah Markah
9 (a)	$2PA = PB$ 1m $2\sqrt{(x-0)^2+(y-1)^2} = \sqrt{(x-0)^2+(y-(-2))^2}$ 1m $x^2+y^2-4y=0$ (Tertunjuk) 1m Ganti (-2,2) ke dalam $x^2+y^2-4y=0$ $(-2)^2+2^2-4(2)$ dan Ya 1m	4	
(b)	$\frac{y-1}{x-0}=\frac{1-2}{0-(-2)}$ atau setara 1m $2y+x=2$ atau setara 1m	2	
(c)	$(2-2y)^2+y^2-4y=0$ atau setara 1m $D\left(\frac{6}{5},\frac{2}{5}\right)$ 1m	2	
(d)	Guna $\frac{1}{2}\|(\quad)-(\quad)\|$ 1m $\frac{8}{5}\ unit^2$ 1m	2	10

[*Lihat halaman sebelah*

No.	Peraturan Permarkahan	Markah	Jumlah Markah
10			
(a)	$4y + 2 = y^2 + 6$ 1m $y = 2$ $Maka, R = (10,2)$ 1m	**2**	
(b)	$\int_0^2 (y^2 + 6)dy - \frac{1}{2}(2 + 10) \times 2$ 1m 1m $= \left[\frac{y^3}{3} + 6y\right] - 12$ 1m $= \left[\frac{2^3}{3} - 6(2)\right] - \left[\frac{0^3}{3} - 6(0)\right] - 12$ 1m $\frac{8}{3} unit$ 1m	**5**	
(c)	$V = \pi\left[\frac{x^2}{2} - 6x\right]$ 1m $\pi\left[\left(\frac{8^2}{2} - 6(8)\right) - \left(\frac{6^2}{2} - 6(6)\right)\right]$ 1m 2π 1m	**3**	
			10

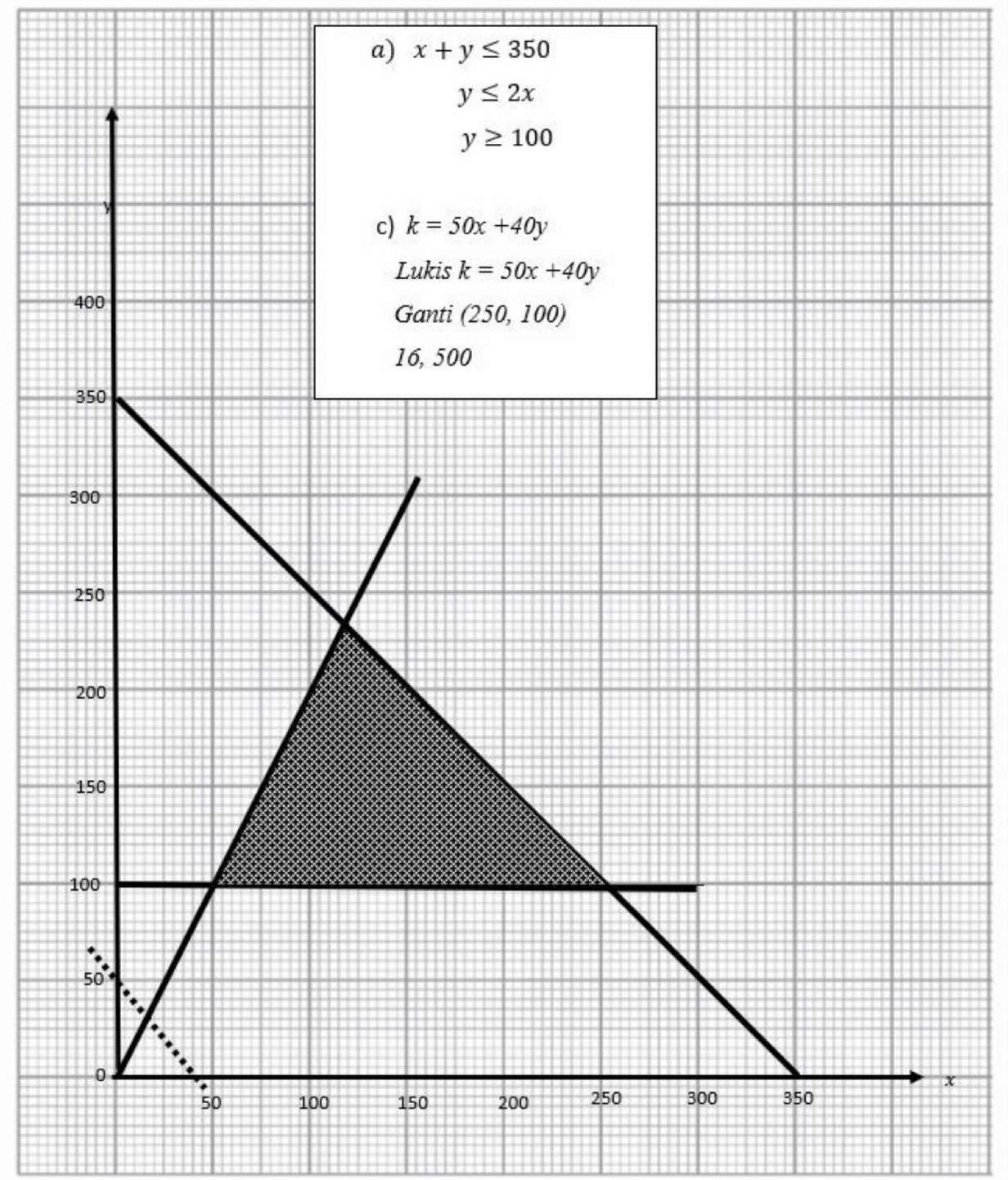
No.	Peraturan Permarkahan	Markah	Jumlah Markah
11			
(a)			
(i)	$x \times \frac{3}{10} = 180$ 1m 600 1m	**2**	
(ii)	${}^7C_0 \left(\frac{3}{10}\right)^0 \left(\frac{7}{10}\right)^7 + {}^7C_1 \left(\frac{3}{10}\right)^1 \left(\frac{7}{10}\right)^6 + {}^7C_2 \left(\frac{3}{10}\right)^2 \left(\frac{7}{10}\right)^5$ 2m 0.6472 1m	**3**	
(b)			
(i)	$2.25 = \frac{16.5-12}{\sigma}$ 1m $\sigma = 2$ 1m	**2**	
(ii)	0.566 @ 0.567 1m $\frac{k-12}{2} = -0.567$ @ -0.566 1m $k = 10.87$ 1m	**3**	
			10

No.	Peraturan Permarkahan	Markah	Jumlah Markah
12			
(a)	$CD^2 = 12^2 + 8^2 - 2(12)(8)cos36$ 1m $CD = 7.257$ 1m	2	
(b)	$\frac{\sin\theta}{8} = \frac{\sin 36}{7.257}$ 1m $\sin\theta = 0.6480$ $\theta = 40.39°$ 1m	2	
(c)	$ACD = 180 - 25 - 139.61$ 1m $\frac{AD}{\sin 15.39} = \frac{7.257}{\sin 25}$ 1m $AD = \frac{7.257 \sin 15.39}{\sin 25}$ 4.557 1m	3	
(d)	$AB = 4.577 + 12 = 16.557$ 1m $luas\ \Delta ABC = \frac{1}{2} \times 16.557 \times 8 \times sin36$ 1m 38.93 1m	3	
			10

No.	Peraturan Permarkahan	Markah	Jumlah Markah
13			
(a)	$s = 3t^3 - 6t^2 - 5t$ $v = \frac{ds}{dt} = 9t^2 - 12t - 5$ $= 9(0)^2 - 12(0) - 5$ $= -5$	**3**	
(b)	$a = \frac{dv}{dt} = 18t + 2$ $= 18(0) + 2$ $= 2$	**2**	
(c)	$v = \frac{ds}{dt} = 9t^2 - 12t - 5 = 0$ $(3t - 5)(3t + 1) = 0$ $t = \frac{5}{3},\ t = -\frac{1}{3},$ $\therefore \quad t = \frac{5}{3}$	**5**	**10**

No.	Peraturan Permarkahan	Markah	Jumlah Markah
14			
(a)	$x + y \leq 350$ 1m		
	$y \leq 2x$ 1m		
	$y \geq 100$ 1m	**3**	
(b)			
	Lukis dengan betul sekurang-kurangnya satu garis lurus dari ketaksamaan yang melibatkan x dan y 1m		
	Lukis dengan betul semua garis lurus 1m		
	Rantau dilorek dengan betul 1m	**3**	
(c)			
	$k = 50x + 40y$ 1m		
	Lukis $k = 50x + 40y$ 1m		
	Ganti (250, 100) 1m		
	16, 500 1m	**4**	
			10

Graf soalan **14**(*b*)



No.	Peraturan Permarkahan	Markah	Jumlah Markah
15			
(a)	$x = \frac{7.50}{6.00} \times 100$ atau $\frac{y}{4.00} \times 100 = 150$ Atau $\frac{7.70}{z} \times 100 = 140$ 1m $x = 125$ 1m y = RM6.00 z = RM 5.50 1m	**3**	
(b)	$I = \frac{125(48)+150(24)+125(16)+140(12)}{48+24+16+12}$ 2m 132.80 1m	**3**	
(c)			
(i)	$\frac{x}{55.50} \times 100 = 105$ 1m x = RM 79.68 1m	**2**	
(ii)	$\frac{132.80 \times 115}{100}$ 1m I = 152.72 1m	**2**	
			10

PERATURAN PERMARKAHAN TAMAT

