

SKEMA JAWAPAN
MODUL PENINGKATAN MURID TINGKATAN 5
TAHUN 2022/2023

MATEMATIK TAMBAHAN
KERTAS 2

2 JAM DAN 30 MINIT

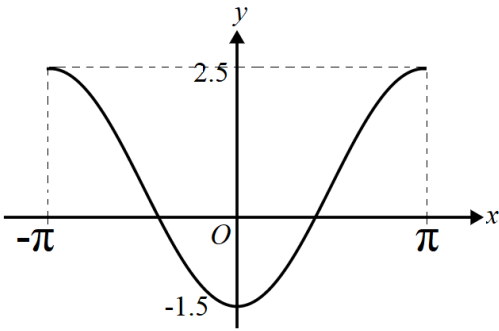
JANGAN BUKA SKEMA PEMARKAHAN INI SEHINGGA DIBERITAHU

1	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)	$2x + 2y + 16 = 36$ atau $\sqrt{x^2 + y^2} = 2\sqrt{13}$ P1 $x = 10 - y$ setara P1 $\sqrt{(10 - y)^2 + y^2} = 2\sqrt{13}$ setara K1 $y^2 - 10y + 24 = 0$ $(y - 6)(y - 4) = 0$ setara K1 $y = 6, y = 4$ N1 $x = 4, x = 6$ N1 $(4 + 8) + 6$ 18 cm N1	7	7

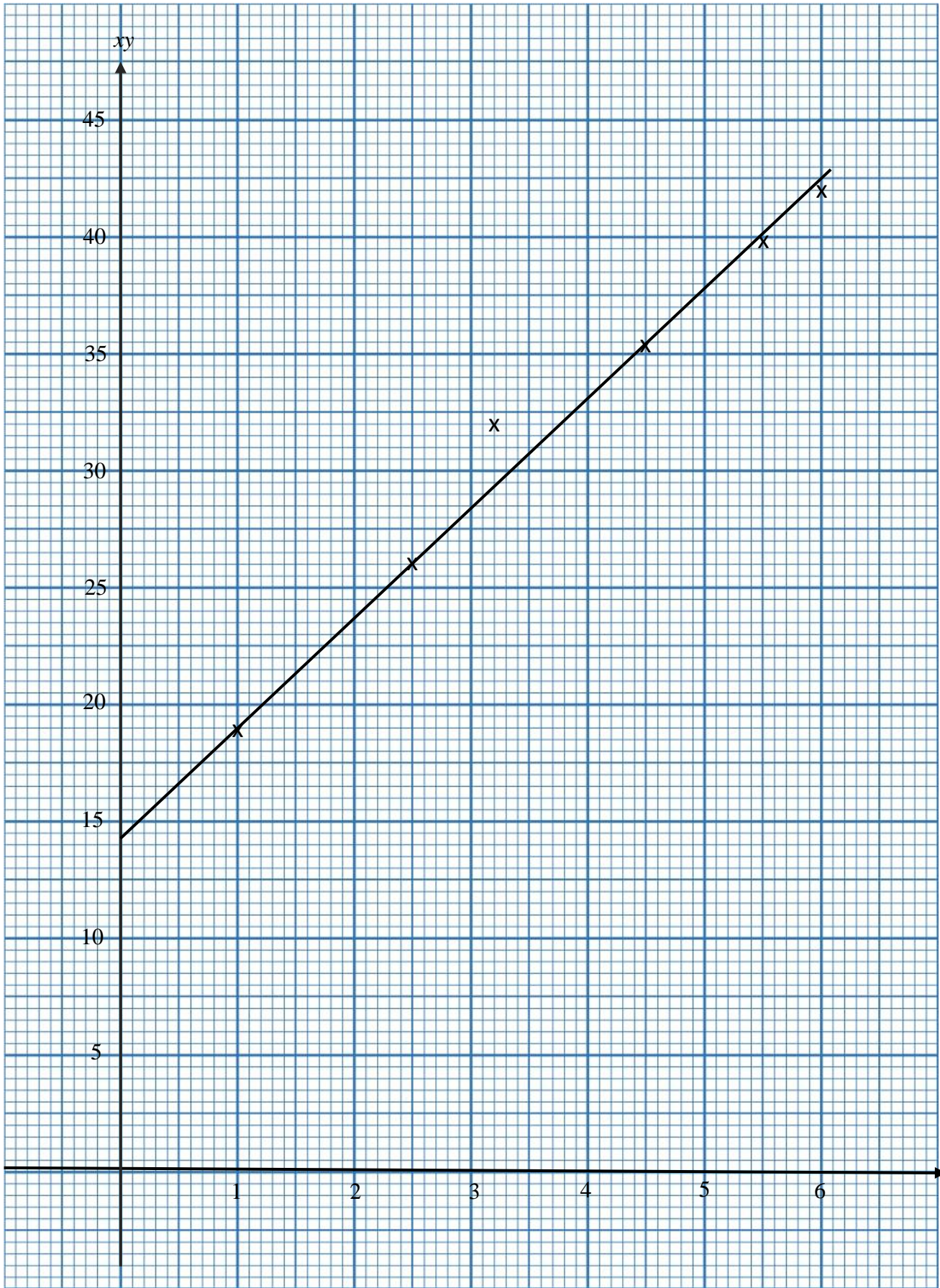
2	Skema Permarkahan	Sub Markah	Jumlah Markah	
(a)	$\frac{dy}{dx} = 8(2x - 3)^3$ $\frac{dy}{dx} = 8(2(1) - 3)^3 \quad \text{K1 ganti nilai } x \text{ dalam fungsi kecerunan}$ $\frac{dy}{dx} = -8$ $m_1 = -8$ $-8 \times m_2 = -1 \quad \text{K1}$ $m_2 = \frac{1}{8}$ $y = \frac{1}{8}x - \frac{25}{8} \quad \text{N1}$	3	7	
(b)	$3 - \frac{3}{x^2} = 0 \quad \text{K1}$ $3x^3 - 3 = 0$ $x^3 = 1$ $x = 1$ $m = 1 \quad \text{N1}$	2		
(c)	$\frac{d^2y}{dx^2} = 3 + \frac{6}{x^3}$ $\frac{d^2y}{dx^2} = 3 + \frac{6}{(1)^3} \quad \text{K1}$ $\frac{d^2y}{dx^2} > 0 \quad \text{minimum N1}$	2		

3	Skema Permarkahan	Sub Markah	Jumlah Markah	
(a)	$m = \tan \theta$ $m = \tan 135^\circ$ atau setara K1 $m = -1$ N1 $y - 4 = -1(x + 2)$ atau setara K1 $y = -x + 2$ N1	4	8	
(b)	$m_{CD} = 1$ $y - 0 = 1(x - 4) / 0 = 4 + c$ $y = x - 4$ N1 $x - 4 = -x + 2$ K1 $x = 3$ $y = 3 - 4$ $y = -1$ $C(3, -1)$ N1	3		
(c)	$x = 3$ N1	1		

4	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)	$hk(x) = 2\left(\frac{x}{p}\right) + 3$ K1 $h^{-1}(x) = \frac{px-3p}{2}$ K1 banding $h^{-1}(x) = x-3$ $p = 2$ N1	3	7
(b)(i)	$k^2(x) = p(px)$ K1 ganti $p = 2$ $k^2(x) = 4x$ N1	2	
(b)(ii)	$k(x) = 2x$ $k^2(x) = 4x$ $k^3(x) = 9x$ $k^4(x) = 16x$ tulis $k^3(x)$ atau $k^4(x)$ K1 $k^n(x) = n^2x$ N1	2	

5	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)	$\frac{1 + \cos x}{\sin x} = \cot \frac{x}{2}$ $\frac{1 + 2\cos^2 \frac{x}{2} - 1}{2\sin \frac{x}{2} \cos \frac{x}{2}} \quad \text{K1}$ $\frac{\cos \frac{x}{2}}{\sin \frac{x}{2}} \quad \text{K1}$ $\cot \frac{x}{2} \quad \text{N1}$	4	
(b)	 <p>Bentuk graf sinus P1</p> <p>$\frac{1}{2}$ kitaran P1</p> <p>Amplitud P1</p> <p>anjakan keatas P1</p>	4	8

6	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)	<p>Rujuk graf</p> <p>Graf garis lurus xy melawan x dilukis K1</p> <ul style="list-style-type: none"> ▪ Paksi-paksi betul dan skala seragam <p>Sekurang-kurangnya 5 titik diplot dengan betul N1</p> <p>Garis penyuaian terbaik N1</p>	3	7
(b)(i)	<p>$xy = \sqrt{r}x + \frac{r}{t}$ P1</p> <p>$r = 21.16$ N1 (ikut jawapan daripada nilai kecerunan calon)</p> <p>$t = 1.459$ N1 (ikut jawapan daripada nilai r calon)</p> <p>$y = 9.06$ N1 (ikut jawapan daripada nilai r calon)</p>	4	



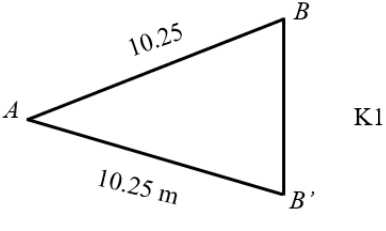
7	Skema Permarkahan	Sub Markah	Jumlah Markah	
(a)(i)	$\overrightarrow{AP} = \frac{3}{4}(\overrightarrow{AO} + \overrightarrow{OB}) \text{ tulis Hukum K1}$ $\overrightarrow{AP} = -\frac{3}{4}\underline{u} + \frac{3}{4}\underline{v}$ $\overrightarrow{OP} = \underline{u} + \frac{3}{4}\underline{v} - \frac{3}{4}\underline{u} \text{ N1}$ $\overrightarrow{OP} = \frac{1}{4}(\underline{u} + 3\underline{v}) \text{ Terbukti N1}$	3	7	
(a)(ii)	$\overrightarrow{PQ} = -\frac{1}{4}\underline{u} - \frac{3}{4}\underline{v} + \frac{2}{3}\underline{w} \text{ N1}$	1		
(b)	$\overrightarrow{BC} = \overrightarrow{BA} + \overrightarrow{AO} + \overrightarrow{OC} \text{ Tulis hukum K1}$ $-\frac{1}{4}\underline{u} - \frac{3}{4}\underline{v} + \frac{2}{3}\underline{w} = \frac{6}{5}(-\underline{v} + \underline{w}) \text{ K1}$ $\underline{w} = \frac{27\underline{v} - 15\underline{u}}{32} \text{ N1}$	3		

8	Skema Permarkahan	Sub Markah	Jumlah Markah	
(a)(i)	$\frac{dy}{dx} = 3x^2 \quad \text{atau} \quad \frac{dy}{dx} = -2x \quad \text{K1}$ $-2 \quad \text{N1}$ <p>Lengkung $y = -x^2 + 2$ N1</p>	3	10	
(a)(ii)	$\int_0^1 -x^2 + 2 \, dx - \int_0^1 x^3 \, dx \quad \text{K1}$ $\left[-\frac{x^3}{3} + 2x \right]_0^1 - \left[\frac{x^4}{4} \right]_0^1 \quad \text{K1}$ $\left(\left[-\frac{(1)^3}{3} + 2(1) \right] - \left[-\frac{(0)^3}{3} + 2(0) \right] \right) - \left(\left[\frac{(1)^4}{4} \right] - \left[\frac{0^4}{4} \right] \right) \quad \text{K1}$ $\frac{17}{12} \text{ unit}^2 \quad \text{N1}$	4		
(b)	$\pi \int_0^k 2x \, dx = 9\pi$ $\left[\frac{2x^2}{2} \right]_0^k = 9 \quad \text{K1}$ $(k^2) - (0) = 9 \quad \text{K1}$ $k = 3 \quad \text{N1}$	3		

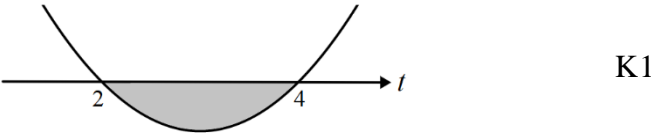
9	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)	<p>Luas Poligon Sekata</p> $= \frac{1}{2} \times r^2 \times \sin 30^\circ \times 12$ $= 3r^2 \quad \text{P1}$ <p>Luas Kawasan Tidak Berlorek</p> $= (2 \times \text{Luas tembereng}) + \text{Luas Segitiga}$ $= 0.1810r^2 + \frac{1}{4}r^2 \quad \text{K1}$ $= 0.431r^2 \quad \text{N1}$ <p>Luas Kawasan Berlorek</p> $= \text{Luas Poligon} - \text{Luas kawasan tidak berlorek}$ $= 3r^2 - 0.431r^2 \quad \text{K1}$ $= 2.569r^2 \text{cm}^2 \quad \text{N1}$	5	
(b)(i)	<p>Panjang sisi x 8</p> $\frac{BS}{\sin 30} = \frac{10}{\sin 75} \quad \text{K1}$ $BS = 5.176$ $\therefore = 5.176 \times 8$ $= 41.408 \text{cm} \quad \text{N1}$ <p>Panjang Lengkuk Berlorek</p> $= r\theta$ $= 10 \left(60 \times \frac{\pi}{180} \right)$ $= 10.47 \text{cm} \quad \text{N1}$ <p>Panjang Lengkuk Berlorek</p> $= 10.47 \times 8$ $= 83.76 \text{cm} \quad \text{N1}$ <p>Perimeter Kawasan Berlorek</p> $= 41.408 + 83.76$ $= 125.168 \text{cm} \quad \text{N1}$	5	10

10	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)(i)	$x - 10 = 90 - x$ K1 $x = 50$ $d = 40$ N1 $T_{20} = 10 + (20 - 1)(40)$ K1 770 N1	4	10
(a)(ii)	$S_8 = \frac{8}{2}[2(10) + (8 - 1)(40)]$ K1 $1200 - 770$ 430 N1	2	
(c)	$850 = 10 + (n - 1)40$ K1 $n = 22$ $RM10 \times 22$ K1 $RM220$ N1 Cukup , kerana tidak melebihi RM250 N1	4	

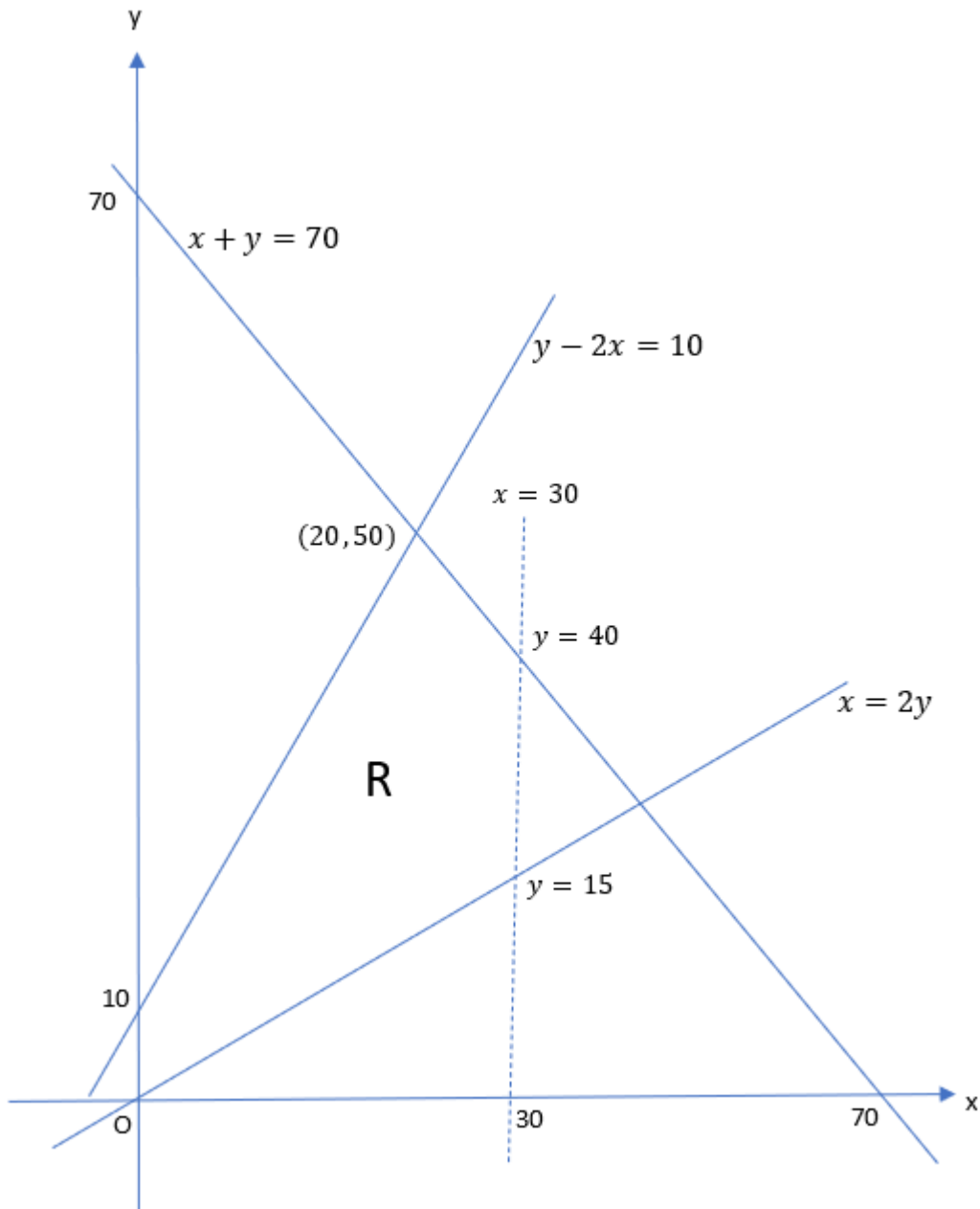
11	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)(i)	$5q = 4$ $q = \frac{4}{5}$ $p = \frac{1}{5}$ N1 $n \left(\frac{1}{5} \right) \left(\frac{4}{5} \right) = 4$ $n = 25$ N1	3	10
(a)(ii)	${}^{25}C_2 \left(\frac{1}{5} \right)^2 \left(\frac{4}{5} \right)^{23}$ K1 0.0708 N1	2	
(b)(i)	$P \left(\frac{3.5 - 4.5}{1.1} < Z \leq \frac{6.5 - 4.5}{1.1} \right)$ K1 0.7837 N1	2	
(b)(ii)	$P(Z < m) = 0.02$ or $P(Z > m) = 0.98$ $Z = 2.054$ N1 $-2.054 = \frac{m - 4.5}{1.1}$ K1 2.241 kg N1	3	

12	Skema Permarkahan	Sub Markah	Jumlah Markah	
(a) (i)	$AB = \sqrt{10^2 + 2.26^2} \quad \text{or} \quad AF = \sqrt{10^2 + 6.26^2}$ $AB = 10.25 \quad \quad \quad AF = 11.80 \quad \quad \quad \text{K1}$ $4^2 = 11.80^2 + 10.25^2 - 2(11.80)(10.25) \cos \angle BAF \quad \text{K1}$ $\angle BAF = 19.30^\circ \quad \quad \quad \text{N1}$	3	10	
(a)(ii)	$\frac{11.80}{\sin \angle DCG} = \frac{4}{\sin 19.30^\circ} \quad \text{K1}$ $\angle DCG = 77.17 \quad \quad \quad \text{N1}$	2		
(a)(iii)	$s = \frac{11.80 + 7.21 + 13.83}{2} \quad \text{K1}$ $s = 16.42$ $\text{Luas } DFG = \sqrt{16.42(16.42 - 11.80)(16.42 - 7.21)(16.42 - 13.83)} \quad \text{K1}$ $= 42.54 \quad \text{N1}$	3		
(b)	 $\angle BAB' = 25.66^\circ \quad \text{NI}$	2		

13	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)(i)	$\frac{720}{Q_0} \times 100 = 120 \quad \text{K1}$ $Q_0 = \text{RM}600.00 \quad \text{N1}$		
(a)(ii)	$126.3 = \frac{(120 \times 144) + (x \times 108) + (150 \times 72) + (108 \times 36)}{(144 + 108 + 72 + 36)} \quad \text{K1}$ $= 125 \quad \text{N1}$	4	
(b)	$I_{\frac{22}{20}} = \frac{(108 \times 144) + (125 \times 108) + (157.5 \times 72) + (108 \times 36)}{(144 + 108 + 72 + 36)} \quad \text{K1}$ <p>Semua Indeks harga $\frac{2022}{2020}$ betul K1</p> <p>123 N1</p> <p>Jumlah perbelanjaan pada tahun 2022 meningkat 23% berbanding tahun 2020 N1</p>	4	10
(c)	$\frac{Q_1}{4000} \times 100 = 123 \quad \text{K1}$ $Q_1 = \text{RM} 4920.00 \quad \text{N1}$	2	

14	Skema Permarkahan	Sub Markah	Jumlah Markah
(a)	ganti $t = 0$ $(0)^2 - 6(0) + 8$ K1 8 ms^{-1} N1	2	10
(b)	$a = 0$ $\frac{dV}{dt} = 2t - 6$ K1 $0 = 2t - 6$ $t = 3$ $v = (3)^2 - 6(3) + 8$ K1 -1 ms^{-1} N1	3	
(c)	$v < 0$ $t^2 - 6t + 8 < 0$ N1  $2 < t < 4$ N1	3	
(d)	$\int_0^2 t^2 - 6t + 8 \, dt + \left \int_2^4 t^2 - 6t + 8 \, dt \right $ $\left[\frac{t^3}{3} - \frac{6t^2}{2} + 8t \right]_0^2 + \left \left[\frac{t^3}{3} - \frac{6t^2}{2} + 8t \right]_2^4 \right $ K1 ganti had untuk mendapatkan nilai K1 $8.67 \text{ m} / \frac{26}{3} \text{ m}$ N1	3	

15	Skema Permarkahan	Sub Markah	Jumlah Markah	
(a)	I $x + y \leq 70$N1 II $x \leq 2y$N1 III $y - 2x \leq 10$N1 Atau Setara	3	10	
(b)	Rujuk graf: -Lukis dengan betul sekurang-kurangnya satu garis lurus daripada *ketaksamaan melibatkan x dan yK1 -Lukis dengan betul semua *garisan lurus daripada *ketaksamaan melibatkan x dan y ...N1 -Tanda R dengan betul N1 <u>Nota:</u> Terima garis putus-putus dan garis penuh.	3		
(c)	(i) $15 \leq y \leq 40$N1 (ii) Koordinat (20, 50)N1 Ganti mana-mana titik dalam *kawasan berlorek dalam $10x + 20y$K1 RM1200N1	4		



PERATURAN PEMARKAHAN TAMAT