

**MODUL PENINGKATAN PRESTASI TINGKATAN 5
TAHUN 2026**

MATEMATIK TAMBAHAN

KERTAS 1

PERATURAN PEMARKAHAN

Peraturan Jawapan ini mengandungi **17** halaman bercetak

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
1. (a) (i)	Koordinat D (10, 0) N1 ✓	1	7
1. (a) (ii)	$m_{AC}(-1) = -1$ K1 $m_1 \times m_2 = -1$ $m_{AC} = 1$ N1	2	
1. (b)	$q = \frac{2(p) + 1(7p)}{1+2}$ atau $2p = \frac{2(0) + 1(2q)}{1+2}$ K1 ✓ $p = \frac{1}{3}q$ ✓ N1 $\frac{0-2p}{10-q} = -1$ K1 $p = 2$ ✓ $q = 6$ ✓ N1 ✓	4	



SERTAI TELEGRAM @exercise_students

$$\frac{dy}{dx} = 2x + 9 \xleftarrow{K1^T} y = x^2 + 9x \rightarrow \frac{dy}{dx} = x^2 + 9 \xrightarrow{K1^T}$$

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
2. (a)	$\frac{dy}{dx} = 2x + 9$ K1 Bila $x = -7$, ✓ $\frac{dy}{dx} = 2(-7) + 9$ $\frac{dy}{dx} = -5$ ✓ Persamaan tangen $y - y_1 = m(x - x_1)$ $y - (-14) = -5(x - (-7))$ K1 ✓ $y = -5x - 49$ N1	$y = mx + C$ $C = \text{--- betul}$	6
2. (b)	$\frac{dA}{dx} = \frac{3}{2}x^2 + 9x$ K1' Bila $x = -5$, $\frac{dA}{dx} = \frac{3}{2}(-5)^2 + 9(-5)$ $\frac{dA}{dx} = -\frac{15}{2}$ $\frac{dA}{dt} = \frac{dA}{dx} \times \frac{dx}{dt}$ $\frac{dA}{dt} = -\frac{15}{2} \times 3$ K1' $\frac{dA}{dt} = -\frac{45}{2}$ ✓ N1' $A = \frac{1}{2}(x^3 + 9x^2)$ $A = \frac{x^3}{2} + \frac{9}{2}x^2$	3	

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
3. (a)	$3^n + 3^{n-1} = k(3^{n-1})$ ← $3^n + \frac{3^n}{3} = k(\frac{3^n}{3})$ ✓ K1 $\frac{4}{3}(3^n) = k(\frac{3^n}{3})$ $4(\frac{3^n}{3}) = k(\frac{3^n}{3})$ $k = 4$ ✓ N1	2	4
3. (b)	$m(\sqrt{p} - \sqrt{q}) = p - q$ $m = \frac{p-q}{\sqrt{p}-\sqrt{q}}$ $m = \frac{p-q}{\sqrt{p}-\sqrt{q}} \times \frac{\sqrt{p}+\sqrt{q}}{\sqrt{p}+\sqrt{q}}$ K1 $m = \frac{(p-q)(\sqrt{p}+\sqrt{q})}{(\sqrt{p})^2 - (\sqrt{q})^2}$ K1 $m = \frac{(p-q)(\sqrt{p}+\sqrt{q})}{p-q}$ $m = \sqrt{p} + \sqrt{q}$ N1 $(a-b)(a+b) = a^2 - b^2$	2	

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
4.	$y = pq^x$ $\ln y = \ln(pq^x)$ $\ln y = \ln p + \ln q^x$ ✓ $\ln y = (\ln q)x + \ln p$ K1 $\ln q = -\frac{2}{5}$ or $\ln p = 2$ (dilihat) $p = e^2$ / 7.389 N1 $q = \frac{1}{e^{\frac{2}{5}}}$ / 0.6703 N1	3	3



SL N	SKEMA PEMARKAHAN	MK H	JU M
5. (a)	$a + (n-1)d \leq 245$ $50 + (n-1)15 \leq 245$ K1 ✓ $n \leq 14$ $n = 14$ N1 ✓	2	
5. (b)	$S_{13} = \frac{13}{2} [2(50) + (13-1)(15)]$ K1' $= 1820$ Jumlah ayam dijual = $1820 + (245 \times 17) = 5985$ Bilangan ayam terjual = $5985 - 87 = 5898$ Harga ayam terjual = $5898 \times (25 - 18) = \text{RM}41286$ @ Sewa tapak = $\text{RM}15 \times 30 = \text{RM}450$ (ii) @ Kos ayam tidak terjual = $\text{RM}18 \times 87 = \text{RM}1566$ K1' Keuntungan jualan ayam = $41286 - 1566 - 450 = \text{RM}39270$ K1' Ya, mencapai sasaran kerana keuntungan $\text{RM}39270 > \text{RM}30000$ N1	4	6

Jika H. $A_2 \dots H_{14}$ | $H_{15} \dots H_{30}$
 $50 \ 75 \dots 245$ | $245 \ 245$
 S_{14} | $16 \text{ hari} \times 245$

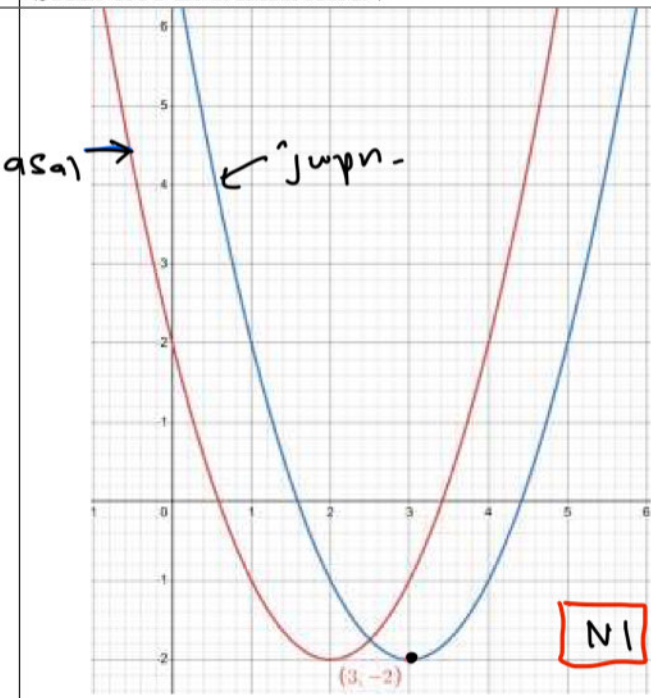
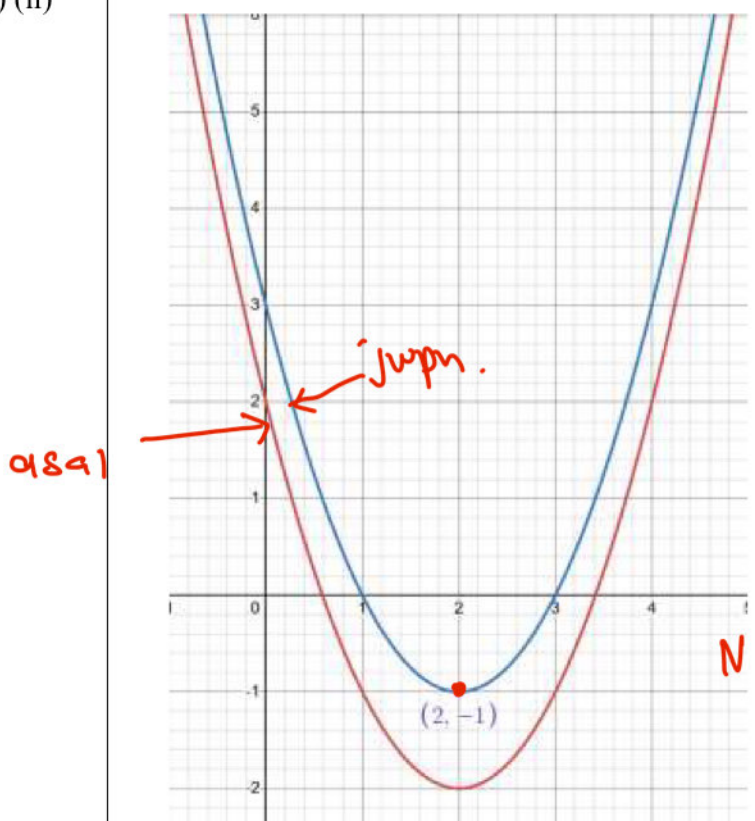
$$S_{14} = \frac{14}{2} [2(50) + (14-1)(15)]$$

$$= 2065$$

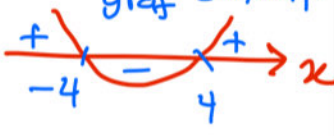
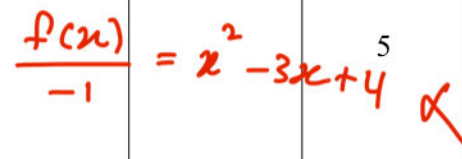
$$\text{bil. ayam terjual.} = 2065 + (245 \times 16) - 87$$

$$= 5898$$

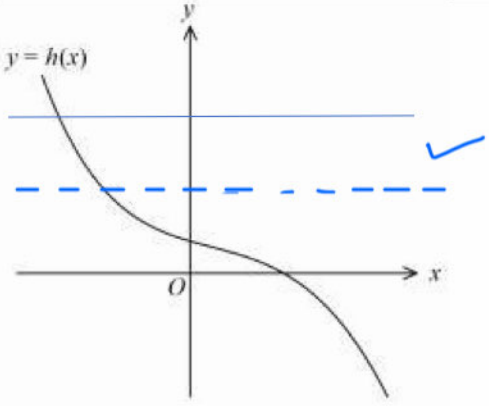
	SKEMA PEMARKAHAN	MARKAH	JUMLAH
6	$f'(x) = 5x^2 - 8x + k$ $f(x) = \int 5x^2 - 8x + k \, dx$ $f(x) = \frac{5}{3}x^3 - \frac{8}{2}x^2 + kx + c$ K1' $f(2) = \frac{5}{3}(2)^3 - \frac{8}{2}(2)^2 + k(2) + c$ (2,16) $18 = \frac{5}{3}(2)^3 - \frac{8}{2}(2)^2 + k(2) + c$ $18 = -\frac{8}{3} + 2k + c$ $2k + c = \frac{62}{3} \rightarrow (1)$ Hapuskan k atau c $k = 7$	$k \neq 1^T$ (mesti .. + c) + 2 sebutan betul kamir $(-1, -6)$ $f(-1) = \frac{5}{3}(-1)^3 - \frac{8}{2}(-1)^2 + k(-1) + c$ $-6 = \frac{5}{3}(-1)^3 - \frac{8}{2}(-1)^2 + k(-1) + c$ $-6 = -\frac{17}{3} - k + c$ $k - c = \frac{1}{3} \rightarrow (2)$ K1 ² N1 ³ (ganti $\frac{1}{3}$ hapus p & $k @ c$)	3

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
7 (a) (i)		1	
7 (a) (ii)		1	2

$$b^2 - 4ac < 0$$

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
7. (b) (i)	$m^2 - 4(-1)(-4) < 0$ K1 P1 $m^2 - 16 < 0$ $(m-4)(m+4) < 0$ (+) maka julat nilai m $-4 < m < 4$ N1 	2	
7. (b) (ii)	nilai integer <u>m</u> yang terbesar ialah 3. $f(x) = -x^2 + 3x - 4$ P1' $f'(x) = -[x^2 - 3x + 4]$ $f'(x) = -\left[x^2 - 3x + \left(\frac{-3}{2}\right)^2 - \left(\frac{-3}{2}\right)^2 + 4\right]$ $f'(x) = -\left[\left(x - \frac{3}{2}\right)^2 + \frac{7}{4}\right]$ $f'(x) = -\left(x - \frac{3}{2}\right)^2 - \frac{7}{4}$ K1' titik minimum maksimum $\left(\frac{3}{2}, -\frac{7}{4}\right)$ N1 	3	



SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
8. (a)	 Fungsi $h(x)$ mempunyai fungsi songsang kerana garis mengufuk <u>menyilang</u> graf $y = h(x)$ pada satu titik sahaja. Nota: Garis Mengufuk <u>mesti dilihat</u> pada satah Cartes (<u>mesti lums</u>)	1	1
8. (b) (i)	$y = \frac{2x+9}{3}$ $x = \frac{3y-9}{2}$ $f^{-1}(x) = \frac{3x-9}{2} \quad \checkmark$ $f^{-1}(4) = \frac{3(4)-9}{2}$ $= \frac{3}{2} \quad \checkmark$ $f(x) = \frac{2x+9}{3}$ K1' inverse. N1² $f^{-1}g(x) = \frac{3g(x)-9}{2}$	(2)	
8. (b) (ii)	$\frac{3g(x)-9}{2} = \frac{15x+3\sqrt{2}+9}{2}$ $3g(x) = 15x+3\sqrt{2}+18$ $g(x) = 5x+\sqrt{2}+6$ $g(3) = 5(3)+\sqrt{2}+6$ $\frac{7}{3}n+\sqrt{2} = 21+\sqrt{2}$ $n = 9 \quad \checkmark$ K1⁴ * K1 K1⁵ ganti $x=3$ N1⁶	$\left(\frac{3g(x)-9}{2} \right)$ P1³ (4)	

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
9. (a)	$\frac{L}{\alpha} = \frac{2\pi p}{2\pi}$ K1 ¹ ✓ $L = p\alpha$ N1 ²	2	5
9. (b) <i>s = rθ</i>	$18 = 30\theta$ & $\theta = \frac{3}{5}$ rad ✓ K1 ³ <u>Luas ACBD</u> $= \frac{1}{2} \left(\frac{3}{5} \right) (30^2 - 10^2)$ K1 ⁴ $= 240 \text{ cm}^2$ N1 ⁵	3	

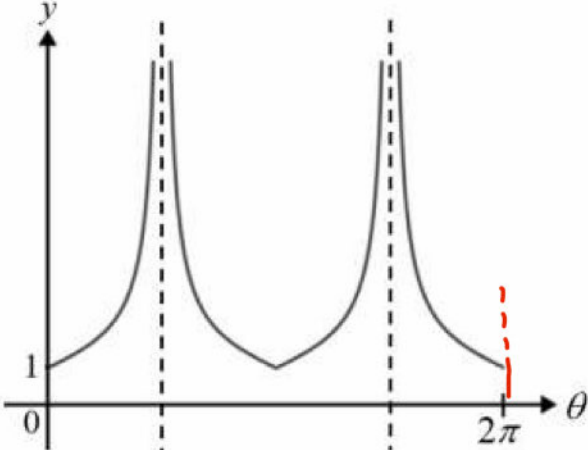
$$\frac{1}{2} \left(\frac{3}{5} \right) (30)^2 @ \frac{1}{2} \left(\frac{3}{5} \right) (10)^2 - K1^4$$

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
10. (a)	$m = 5$ N1 $P(X=0) = \frac{3}{32}$ N1 * tak terima 0.09375	2	6
10. (b)	$\frac{3}{32} + k + \frac{3}{16} + \frac{1}{4} + \frac{7}{32} + k = 1$ K1 $k = \frac{1}{8}$ N1	2	
10. (c)	$\left(\frac{1}{4} + \frac{7}{32} + \frac{1}{8} \right) = \frac{19}{32}$ N1 $\frac{19}{32} \times 100 = 59.38$ N1	2	

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
11. (a)	$= \frac{10!}{4!3!3!} @ \frac{8!}{2!3!3!}$ $= 4200 - 560$ $= 3640 \text{ cara}$	2	6
11. (b)	$= (14-1)! @ \frac{14!}{14}$ $= 6227020800$	1	
11. (c) (i)	${}^8C_3 = 56$	1	
11. (c) (ii)	${}^{10}C_6 \times {}^8C_0$ $@$ ${}^{10}C_4 \times {}^8C_1$ $\text{Bilangan cara} = {}^{10}C_6 \times {}^8C_0 + {}^{10}C_4 \times {}^8C_1$ $\text{Bilangan cara} = 210 + 1680$ $= 1890 \text{ cara}$	2	

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
12. (a)	$\vec{AB} = \vec{AO} + \vec{OB}$ $= (-2\hat{i} - \hat{j}) + (6\hat{i} + 5\hat{j})$ $= 4\hat{i} + 4\hat{j} \quad \checkmark$		
12. (b)	$\vec{AC} = \frac{1}{3}\vec{AB}$ $= \frac{1}{3}(4\hat{i} + 4\hat{j})$ $= \frac{4}{3}\hat{i} + \frac{4}{3}\hat{j} \quad \checkmark$ $\vec{OC} = \vec{OA} + \vec{AC}$ $= (2\hat{i} + \hat{j}) + (\frac{4}{3}\hat{i} + \frac{4}{3}\hat{j})$ $= (2 + \frac{4}{3})\hat{i} + (1 + \frac{4}{3})\hat{j}$ $= \frac{10}{3}\hat{i} + \frac{7}{3}\hat{j}$ $= (\frac{10}{3}, \frac{7}{3}) \quad \checkmark$	N1¹ P1² ✓ K1³ N1	

Nota: terima guna rumus temberang

SOALAN	SKEMA PEMARKAHAN	MARKA H	JUMLA H
13. (a) (i)	$\frac{1 - \cos \theta + \cos 2\theta}{\sin 2\theta - \sin \theta}$ $= \frac{1 - \cos \theta + 2\cos^2 \theta - 1}{2\sin \theta \cos \theta - \sin \theta} \quad \text{K1}^1$ $= \frac{\cos \theta (2\cos \theta - 1)}{\sin \theta (2\cos \theta - 1)}$ $= \frac{\cos \theta}{\sin \theta}$ $= \cot \theta \quad \text{N1}^2$	2	8
13. (a) (ii)	$\cot \theta = \frac{1}{\sqrt{3}}$ $\frac{1}{\tan \theta} = \frac{1}{\sqrt{3}} \quad \text{K1}^3 \checkmark$ $\tan \theta = \sqrt{3}$ jika tidak jawab (a)(i), K1 N1 N0 $\text{sudut rujukan} = \frac{1}{3}\pi \quad \text{N1}^4 \checkmark$ $\theta = \frac{1}{3}\pi, \frac{4}{3}\pi \quad \text{N1}^5 \times$	3	
13. (b)	 P1 = Bentuk graf tan sekurang 1 kitaran P1 = Modulus dan julat betul $0 \leq \theta \leq 2\pi$ P1 = Anjakan 1 unit keatas	3	

SOALAN	SKEMA PEMARKAHAN	MARKA H	JUMLA H
14. (a)	$px^2 - 20x + 25 = 0$ P1 $SOR = -\frac{b}{a}$ $POR = \frac{c}{a}$ $\alpha + \beta = -\frac{(-20)}{p}$ or $\alpha\beta = \frac{25}{p}$ K1 $\alpha + \beta = \frac{20}{p}$ and $\alpha\beta = \frac{25}{p}$ N1	3	8
14. (b) (i)	$SOR = \alpha + \beta - 4$ or $POR = \alpha\beta - 2(\alpha + \beta) + 4$ $= \frac{20}{p} - 4$ $= \frac{25}{p} - 2\left(\frac{20}{p}\right) + 4$ $= \frac{20}{p} - 4$ $= 4 - \frac{15}{p}$ $x^2 - \left(\frac{20}{p} - 4\right)x + 4 - \frac{15}{p} = 0$ N1 $px^2 + (4p - 20)x + 4p - 15 = 0$ N1 <u>$b^2 - 4ac = 0$</u>	K1 3	
14. (b) (ii)	$(4p - 20)^2 - 4(p)(4p - 15) = 0$ K1 $16p^2 - 160p + 400 - 16p^2 + 60p = 0$ $400 - 100p = 0$ $p = \cancel{25}$ N1 ✓ $p = 4$	2	

SOALAN	SKEMA PEMARKAHAN	MARKAH	JUMLAH
15. (a) (i)	$\vec{AB} = \vec{AO} + \vec{OB}$ P1 ¹ ✓ $\vec{AB} = -(8\hat{i} + 6\hat{j}) + 14\hat{i} - 2\hat{j}$ $\vec{AB} = 6\hat{i} - 8\hat{j}$ N1 ² ✓	2	8
15. (a) (ii)	$AB = \sqrt{6^2 + (-8)^2}$ K1 ³ ✓ $AB = 10$ ✓ N1 ⁴	2	
15. (b) (i)	$\vec{AC} = 3\vec{CB}$ P1 ⁵ @ $\vec{AC} = \frac{3}{4}\vec{AB}$ $\vec{AO} + \vec{OC} = 3(\vec{CO} + \vec{OB})$ $-\vec{OA} + \vec{OC} = 3\vec{CO} + 3\vec{OB}$ P1 ⁶ <u>$4\vec{OC} = 3\vec{OB} + \vec{OA}$</u> <u>$4\vec{OC} = 3(14\hat{i} - 2\hat{j}) + 8\hat{i} + 6\hat{j}$</u> K1 ⁷ <u>$4\vec{OC} = 50\hat{i}$</u> <u>$\vec{OC} = \frac{25}{2}\hat{i}$</u> N1 ⁸	4	
JUMLAH			8

TAMAT

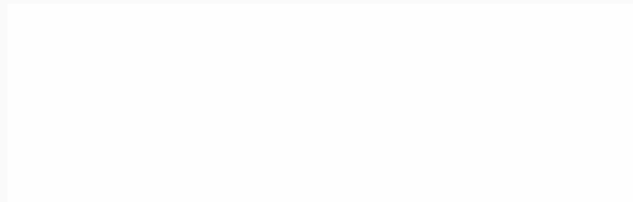
MODUL PENINGKATAN TINGKATAN 5

TAHUN 2026

MATEMATIK TAMBAHAN KERTAS 2

17/07/2026

PERATURAN PEMARKAHAN



Peraturan Jawapan ini mengandungi 17 halaman bercetak

No.	Penyelesaian	Markah
1(a)(i)	$m = 2$ N1	1
1(a)(ii)	$\frac{hx+k}{x-2} = y$ $y(x-2) = hx+k$ $xy-hx = k+2y$ $x(y-h) = k+2y$ $x = \frac{k+2y}{y-h}$ $f^{-1} = \frac{k+2x}{x-h} \quad \text{N1}$ $\frac{k+2x}{x-h} = \frac{2x-5}{x-3} \quad \text{Bandingkan K1}$ $k = -5 \quad \text{DAN} \quad h = 3 \quad \text{N1}$	3
1(b)	$\frac{3x-5}{x-2} = 2x \quad \text{K1}$ $3x-5 = 2x(x-2)$ $3x-5 = 2x^2-4x$ $2x^2-4x-3x+5 = 0$ $2x^2-7x+5 = 0$ $(2x-5)(x-1) = 0 \quad \text{K1}$ $x = \frac{5}{2}, x = 1 \quad \text{N1}$	3
JUMLAH		7

No.	Penyelesaian	Markah
2(a)(i)	$x^2 - 2x + 3 = -x^2 + 4x + 3$ $2x^2 - 6x = 0$ $2x(x - 3) = 0$ K1 $x = 0, x = 3$ $k = 3$ N1	2
2(a)(ii)	$\int_0^3 -x^2 + 4x + 3 \, dx - \int_0^3 x^2 - 2x + 3 \, dx$ $\int_0^3 -2x^2 + 6x \, dx$ $\left[\left(-\frac{2x^3}{3} + \frac{6x^2}{2} \right) \right]_0^3$ K1 (lihat kuasa bertambah 1 untuk 2 sebutan) $\left[\left(-\frac{2(3)^3}{3} + \frac{6(3)^2}{2} \right) - \left(-\frac{2(0)^3}{3} + \frac{6(0)^2}{2} \right) \right]$ K1 (ganti nilai had) $\int_0^3$ 9 N1	3
2(b)	$y^2 = x - 1$ $\pi \int_1^5 x - 1 \, dx$ $\pi \left[\frac{x^2}{2} - x \right]_1^5$ DAN (Kamir 2 sebutan & ganti had) $\pi \left[\left(\frac{(5)^2}{2} - (5) \right) - \left(\frac{(1)^2}{2} - (1) \right) \right]$ K1 8π N1	2
JUMLAH		7



SERTAI TELEGRAM @exercise_students



No	Penyelesaian	Markah
3(a)	$(x-3)^2 = (2\sqrt{x})^2$ $x^2 - 10x + 9 = 0$ $(x-1)(x-9) = 0 \quad \text{K1}$ $x = 1 \text{ (abaikan) }, x = 9$ $x = 9 \quad \text{N1}$	2
3(b)	$4^{x+2} = 24 + 4^{x+1}$ $4^{x+2} - 4^{x+1} = 24$ $4^x \times 4^2 - 4^x \times 4^1 = 24 \quad \text{K1 (guna hukum indeks)}$ $4^x (16 - 4) = 24$ $4^x = \frac{24}{12}$ $4^x = 2$ $2^{2x} = 2^1 \quad \text{K1}$ $x = \frac{1}{2} \quad \text{N1}$	3
3(c)	$\frac{\log_3 \left(\frac{27b}{c} \right)}{\log_3 9} \quad \text{atau} \quad \log_9 27 + \log_9 b - \log_9 c \quad \text{K1 (guna hukum log)}$ $= \frac{3 \log_3 3 + \log_3 b - \log_3 c}{2} \quad \text{K1}$ $= \frac{3 + p - q}{2} \quad \text{N1 (setara)}$	3
JUMLAH		8

No	Penyelesaian	Markah
4	$x + y + z = 24$ P1 $2x - y = 4$ P1 $x + y - z = 4$ P1 Hapus anu pertama K1 (kaedah penggantian @ penghapusan) Hapus anu kedua K1 (kaedah penggantian @ penghapusan) $x = 6 @ y = 8 @ z = 10$ N1 $y = 8 \text{ \& } z = 10$ @ $x = 6 \text{ \& } z = 10$ @ $x = 6 \text{ \& } y = 8$ N1	7
	JUMLAH	7

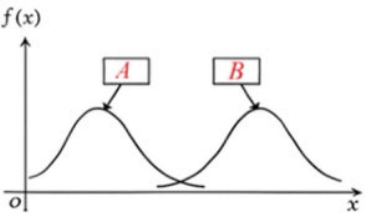
No	Penyelesaian	Markah
5	$g(x) = \frac{1}{2}x^3 - 3x^2 - 5$ $g'(x) = \frac{3}{2}x^2 - 6x \quad \text{K1}$ $g'(x) = 0$ $\frac{3}{2}x^2 - 6x = 0 \quad \text{K1 samakan dengan 0 dan selesaikan}$ $x^2 - 4x = 0$ $x(x - 4) = 0$ $x = 0, x = 4 \quad \text{N1}$ (menggunakan terbitan kedua untuk menentukan kedalaman tasik) $g''(x) = 3x - 6$ DAN $3(0) - 6 = -4 \quad 3(4) - 6 = 6$ $g''(x) < 0 \quad g''(x) > 0 \quad \text{K1}$ $\therefore$ Kedalaman maksimum , pada titik $x = 4$ $\frac{1}{2}(4)^3 - 3(4)^2 - 5 \quad \text{K1}$ -21 21 m N1	6
	JUMLAH	6

No.	Penyelesaian	Markah
6(a)	$s = 10[2(3.142) - 1.75]$ K1 $s = 45.34$ N1 $AB^2 = 10^2 + 10^2 - 2(10)(10)\cos\left(1.75 \text{ rad} \times \frac{180^\circ}{3.142 \text{ rad}}\right)$ K1 (setara) $= 15.35$ $perimeter = 45.34 + 15.35$ K1 $= 60.69$ N1	5
6(b)	$\frac{1}{2}(10)^2(1.75)$ atau $\frac{1}{2}(10)(10)\sin 100.25^\circ$ K1 $\frac{1}{2}(10)^2(1.75) - \frac{1}{2}(10)(10)\sin 100.25^\circ$ K1 $= 38.30$ N1	3
JUMLAH		8

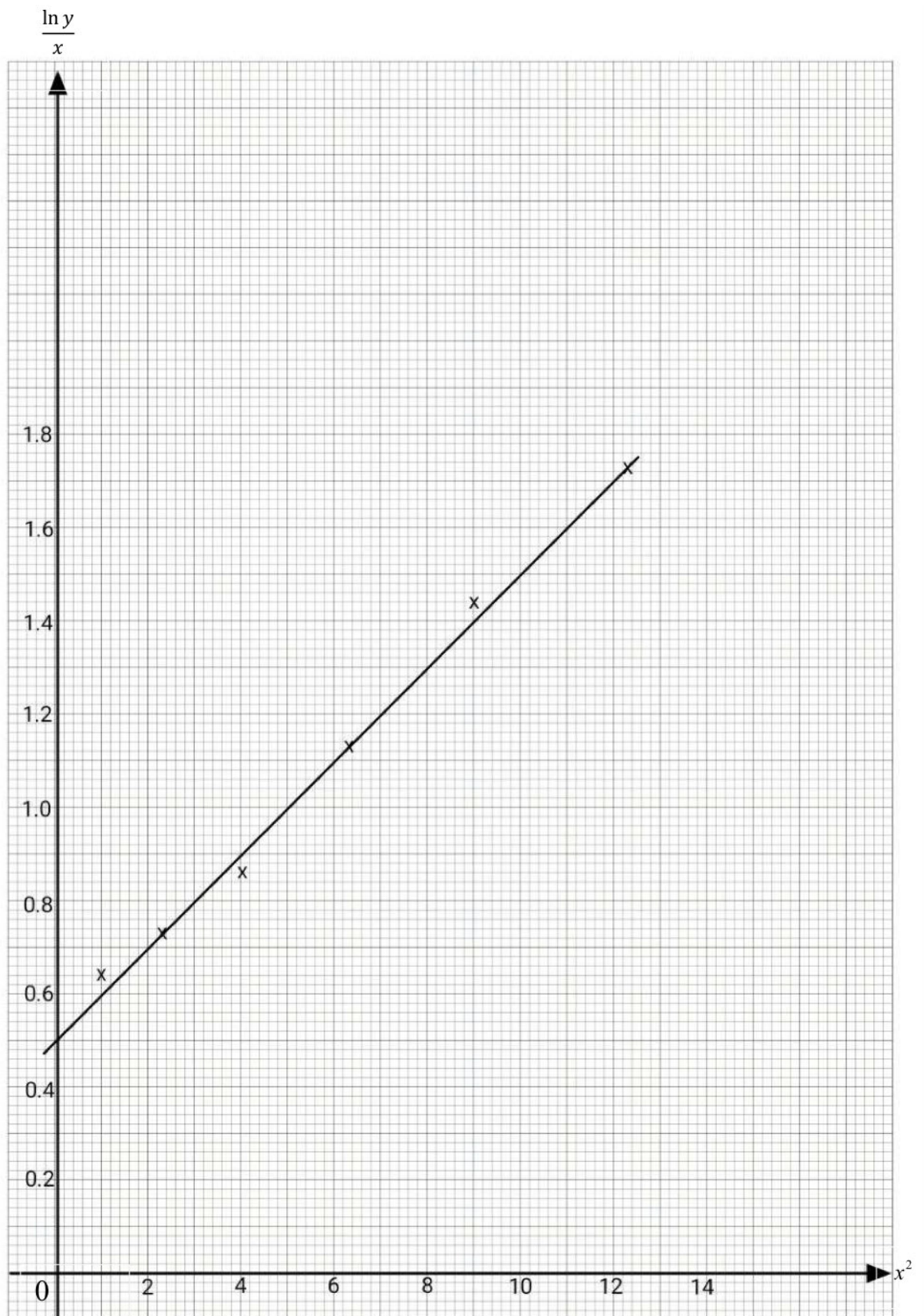
No.	Penyelesaian	Markah
7(a)(i)	$4y = \sqrt{128}$ Nota: $\sqrt{128} = \sqrt{64 \times 2} = \sqrt{4 \times 4 \times 4 \times 2}$ dilihat P1 $y = \frac{8\sqrt{2}}{4}$ $y = 2\sqrt{2}$ N1	2
7(a)(ii)	$\sqrt{128} = 8\sqrt{2}$ $d = 4$ $S_6 = \frac{6}{2} [2(8\sqrt{2}) + (6-1)4]$ K1 $S_6 = 48\sqrt{2} + 60$ $\frac{1}{S_6} = \frac{1}{48\sqrt{2} + 60}$ $\frac{1}{48\sqrt{2} + 60} \times \frac{48\sqrt{2} - 60}{48\sqrt{2} - 60}$ $\frac{48\sqrt{2} - 60}{(48\sqrt{2})^2 - (60)^2}$ K1 $\frac{-5 + 4\sqrt{2}}{84}$ N1	3
7(b)	Luas segiempat tepat: $L_2 - L_1 = mn + m - mn$ $d_1 = m$ DAN $L_3 - L_2 = mn + 2m - (mn + m)$ $d_2 = m$ Tunjukkan mencari beza sepunya K1 $d_1 = d_2 = m$ N1	2
Jumlah		7



SERTAI TELEGRAM @exercise_students

No.	Penyelesaian	Markah						
8(a)(i)	$P(X > 20) = 0.2420$ $P\left(z > \frac{20-h}{10}\right) = 0.2420$ P1 $\frac{20-h}{10} = 0.7$ K1 $h = 13$ N1  Betul semua N2	5						
8(a)(ii)	$P\left(\frac{10-15.5}{10} \leq z \leq \frac{20-15.5}{10}\right)$ P1 $P(-0.55 \leq z \leq 0.45)$ $1 - P(z > 0.55) - P(z > 0.45)$ DAN K1 $1 - 0.2912 - 0.3264$ ATAU Label dan lorek pada lakaran graf normal DAN $1 - 0.2912 - 0.3264$ K1 (guna pembaris, ada label paksi dan O dan rantau betul) 0.3824 N1	3						
8(b)	<table border="1"><thead><tr><th>Botol</th><th>Lengkung Normal</th></tr></thead><tbody><tr><td>A</td><td>(i) p1 N1</td></tr><tr><td>B</td><td>(ii) p2 N1</td></tr></tbody></table>	Botol	Lengkung Normal	A	(i) p1 N1	B	(ii) p2 N1	2
Botol	Lengkung Normal							
A	(i) p1 N1							
B	(ii) p2 N1							
JUMLAH		10						

No.	Penyelesaian								Markah																
9 (a)	<table><tr><td>x^2</td><td>1.00</td><td>2.25</td><td>4.00</td><td>6.25</td><td>9.00</td><td>12.25</td><td>N1</td></tr><tr><td>$\frac{\ln y}{x}$</td><td>0.64</td><td>0.73</td><td>0.86</td><td>1.13</td><td>1.44</td><td>1.73</td><td>N1</td></tr></table>								x^2	1.00	2.25	4.00	6.25	9.00	12.25	N1	$\frac{\ln y}{x}$	0.64	0.73	0.86	1.13	1.44	1.73	N1	2
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$\frac{\ln y}{x}$	0.64	0.73	0.86	1.13	1.44	1.73	N1																		
9 (b)	Rujuk graf K1: Graf garis lurus $\frac{\ln y}{x}$ melawan x^2 dilukis dan sekurang-kurangnya satu *titik diplot dengan betul. NI : 6 *titik diplot dengan betul. N1 : Garis lurus penyuaian terbaik								3																
9 (c) (i)	$\frac{\ln y}{x} = bx^2 + a$ P1								5																
	$a = 0.5$ N1																								
(ii)	$b = \frac{1.7 - 0.5}{12 - 0}$ K1																								
	$b = 0.1 \pm 0.05$ N1																								
(iii)	$y = 3.688$ N1																								
	JUMLAH								10																





No.	Penyelesaian	Markah
10(a)(i)	KAEDAH 1 $f(x) = -\frac{3}{100} \left(x^2 - 80x + \left(-\frac{80}{2} \right)^2 - \left(-\frac{80}{2} \right)^2 \right) \quad \text{K1}$ $f(x) = -\frac{3}{100} \left((x-40)^2 - (-40)^2 \right)$ $f(x) = -\frac{3}{100} (x-40)^2 + 48 \quad \text{K1}$ 48 N1 ATAU KAEDAH 2 KAEDAH 3 $\frac{b}{2a} = -\frac{2.4}{2(-0.03)} \quad \text{K1} \quad @ \quad f'(x) = -\frac{6}{100}x + \frac{12}{5} = 0 \quad \text{K1}$ $= 40 \quad x = 40$ $f(40) = -\frac{3}{100} (40)^2 + \frac{12}{5} (40) \quad \text{K1}$ 48 N1	3
10(a)(ii)	$d = 80 \quad \text{N1}$	1
10(b)(i)	$k(x) = a(x-36)^2 + 24 \quad \text{K1}$ $(0,0): \quad 0 = a(0-36)^2 + 24$ $1296a = -24$ $a = -\frac{1}{54} \quad \text{N1}$ $k(x) = -\frac{1}{54} (x-36)^2 + 24 \quad \text{N1}$	3
10(b)(i)	$y = 0, \quad 0 = -20x^2 + 1480x$ $0 = -20x(x-74) \quad \text{K1}$ $x = 0 \text{ (abaikan) } \text{ atau } x = 74 \quad \text{NI}$ Jarak roket air kumpulan Badrul dari tapak pelancar adalah 74 m iaitu lebih dekat dengan sasaran berbanding dengan roket air kumpulan Aleeya yang 72 m dari tapak pelancar. atau $74 > 72$ atau $6 < 8$ N1 diberikan mana-mana diatas	3
JUMLAH		10

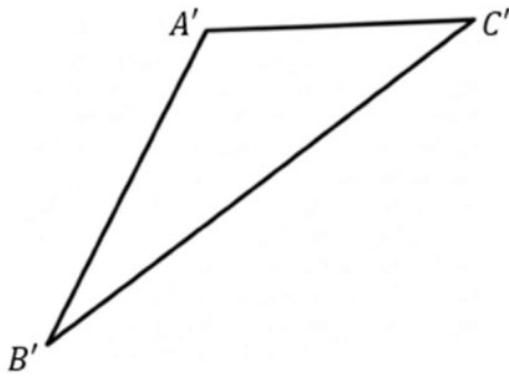
No.	Penyelesaian	Markah
11(a)	$\left(\frac{6-3}{0-h}\right)\left(\frac{2h+1-2}{4-(-1)}\right) = -1 \quad \text{K1 (setara)}$ $\left(\frac{3}{-h}\right)\left(\frac{2h-1}{5}\right) = -1$ $6h-3 = 5h$ $h = 3 \quad \text{N1}$	2
11(b)(i)	Guna $\frac{1}{2}[(x_1 - x_2) - (y_1 - y_2)]$ $= \frac{1}{2}[(0)(2) + (-1)(3) + (3)(7) + (4)(6)] - [6(-1) + 2(3) + 3(4) + 7(0)] \quad \text{K1}$ $= \frac{1}{2} 30 $ $= 15 \quad \text{N1}$	2
11(b)(ii)	$\sqrt{(x-3)^2 + (y-3)^2} @ \sqrt{(x-0)^2 + (y-6)^2} \quad (\text{Guna rumus jarak}) \quad \text{K1}$ $\frac{\sqrt{(x-3)^2 + (y-3)^2}}{\sqrt{(x-0)^2 + (y-6)^2}} = \frac{1}{2}$ atau $2\sqrt{(x-3)^2 + (y-3)^2} = \sqrt{(x-0)^2 + (y-6)^2} \quad \text{K1}$ $4(x^2 - 6x + 9 + y^2 - 6y + 9) = 1(x^2 + y^2 - 12y + 36)$ $4x^2 + 4y^2 - 24x - 24y + 72 = x^2 + y^2 - 12y + 36$ $3x^2 + 3y^2 - 24x - 12y + 36 = 0$ $x^2 + y^2 - 8x - 4y + 12 = 0 \quad \text{N1}$ $y = 0$: $x^2 - 8x + 12 = 0$ Tunjukkan $b^2 - 4ac > 0$ $(-8)^2 - 4(1)(12) = 16 \quad \text{K1}$ $16 > 0$ $(x-2)(x-6) = 0 \quad \text{K1}$ $x = 2, \quad x = 6$ $(2,0) \text{ dan } (6,0) \quad \text{N1}$	6
JUMLAH		10

No.	Penyelesaian	Markah
12(a)	$v_{awal} = 21 \text{ m s}^{-1}$ N1	1
12(b)	$t^2 - 4t - 21 = 0$ $(t-7)(t+3) = 0$ K1 $t-7 = 0$, $t+3 = 0$ $t = 7$, $t = -3$ (abaikan) N1	2
12(c)	$\frac{dv}{dt} = 0$ $-2t + 4 = 0$ K1 $t = 2$ $v_{maks} = -(2)^2 + 4(2) + 21$ K1 $= 25$ N1	3
12(d)	$\int_0^7 -t^2 + 4t + 21 \, dt + \left \int_7^{10} -t^2 + 4t + 21 \, dt \right $ K1 $= \left[-\frac{t^3}{3} + \frac{4t^2}{2} + 21t \right]_0^7 + \left[-\frac{t^3}{3} + \frac{4t^2}{2} + 21t \right]_7^{10}$ K1 $= \left[\left(-\frac{(7)^3}{3} + \frac{4(7)^2}{2} + 21(7) \right) - \left(-\frac{(0)^3}{3} + \frac{4(0)^2}{2} + 21(0) \right) \right]$ $+ \left[\left(-\frac{(10)^3}{3} + \frac{4(10)^2}{2} + 21(10) \right) - \left(-\frac{(7)^3}{3} + \frac{4(7)^2}{2} + 21(7) \right) \right]$ K1 $= 184\frac{2}{3}$ N1	4
JUMLAH		10

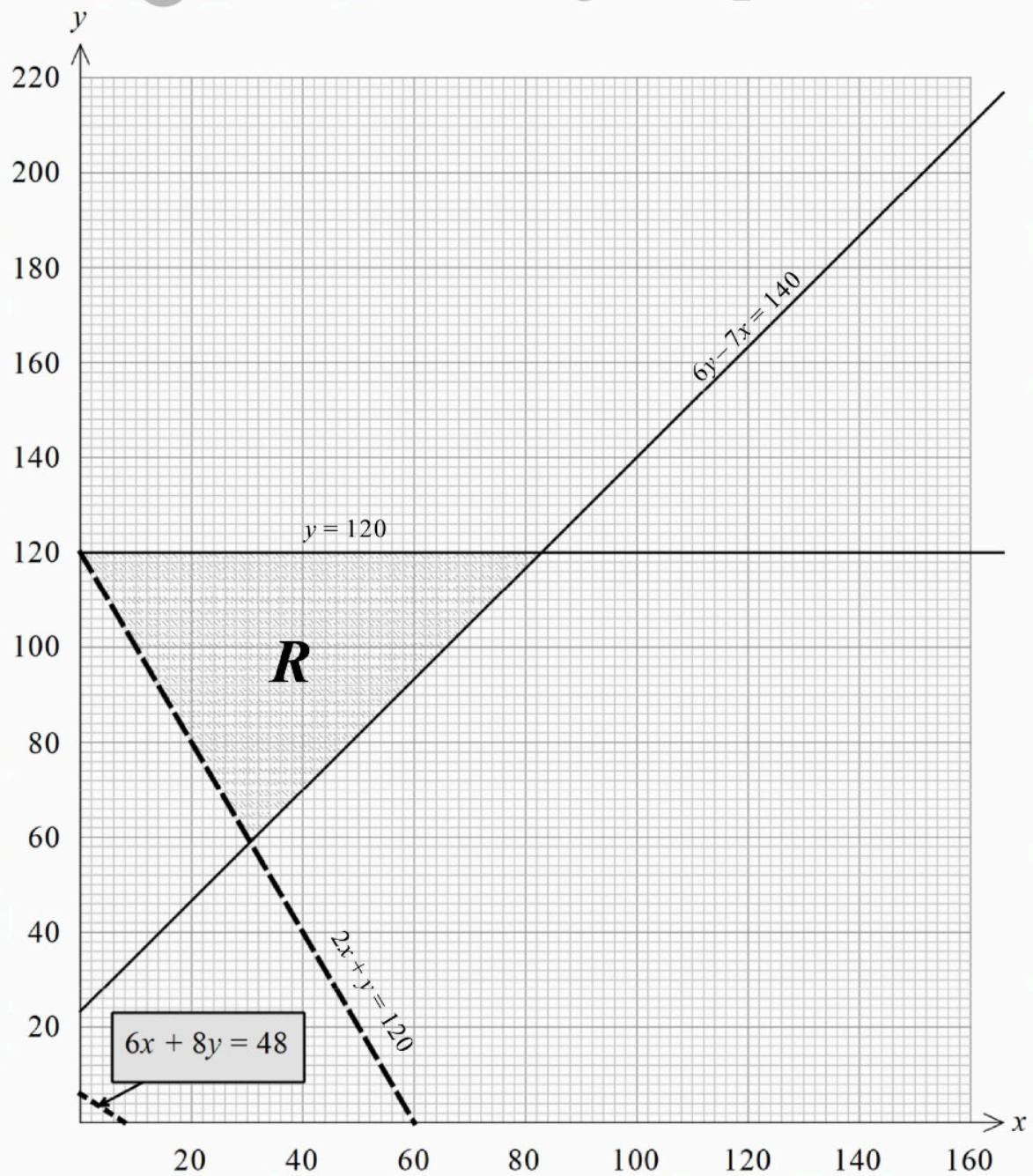
No.	Penyelesaian	Markah
13 (a)(i)	$\frac{x}{4.20} \times 100 = 130$ K1 $x = 5.46$ N1	2
13 (a)(ii)	$\frac{(2.10 + y)}{y} \times 100 = 140$ atau $\frac{z}{(z - 2.10)} \times 100 = 140$ K1 $y = 5.25$ N1 dan $z = 7.35$ N1	3
13 (b)	$\frac{130(5) + 140m + 150n + 125(4)}{5 + m + n + 4} = 128$ K1 $m = \frac{1 - 11n}{6}$ N1 (setara)	2
13 (c)	$\frac{128 \times 135}{100}$ K1 172.8 $\frac{(52 - 8)}{Q_{22}} \times 100 = 172.8$ K1 $Q_{22} = 25.46$ N1	3
JUMLAH		10



SERTAI TELEGRAM @exercise_students

No.	Penyelesaian	Markah
14(a)	$\sin C = \frac{h}{a}$ $h = a \sin C \quad \text{K1}$ $\text{Luas} = \frac{1}{2} \times b \times a \sin C$ $\text{Luas} = \frac{1}{2} ab \sin C \quad \text{N1}$	2
14(b)(i)	$AC^2 = 7^2 + 9^2 - 2(7)(9)\cos 105^\circ \quad \text{K1}$ $AC = 12.75 \quad \text{N1}$	2
14(b)(ii)	 Mesti guna pembaris N1	1
14(c)(i)	$\sqrt{149} \text{ // } 12.21 \text{ @ } \sqrt{262.56} \text{ // } 16.20$ $s = \frac{9 + 12.21 + 16.20}{2}$ $\text{luas } \triangle VBC = \sqrt{18.71(18.71 - 9)(18.71 - 12.21)(18.71 - 16.20)} \quad \text{K1}$ $\text{luas } \triangle VBC = 54.32 \leftrightarrow 54.44 \quad \text{N1}$	3
14(c)(ii)	Biarkan , y = Jalur emas $\frac{1}{2} \times 9 \times y = 54.44 \text{ // } 54.32 \quad \text{K1}$ $y = 12.08 \leftrightarrow 12.10 \quad \text{N1}$	2
	JUMLAH	10

No.	Penyelesaian	Markah
15 (a)	$6y - 7x \geq 140$ N1 $y \leq 120$ N1	2
15 (b)	$2x + y > 120$ N1	2
15 (c)	Rujuk graf • Lukis sekurang-kurangnya satu garis lurus K1 • Lorekkan kawasan yang betul N1	2
15d(i)	$60 < y \leq 120$ N1	2
15d(ii)	$6x + 8y = k$ N1 Lukis $6x + 8y = k$ & Ganti mana-mana titik integer dalam *rantau K1 Ganti (31, 60) ke dalam $6x + 8y$ K1 $6(31) + 8(60)$ 666 N1	4
	JUMLAH	10



TAMAT