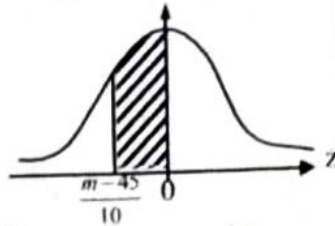


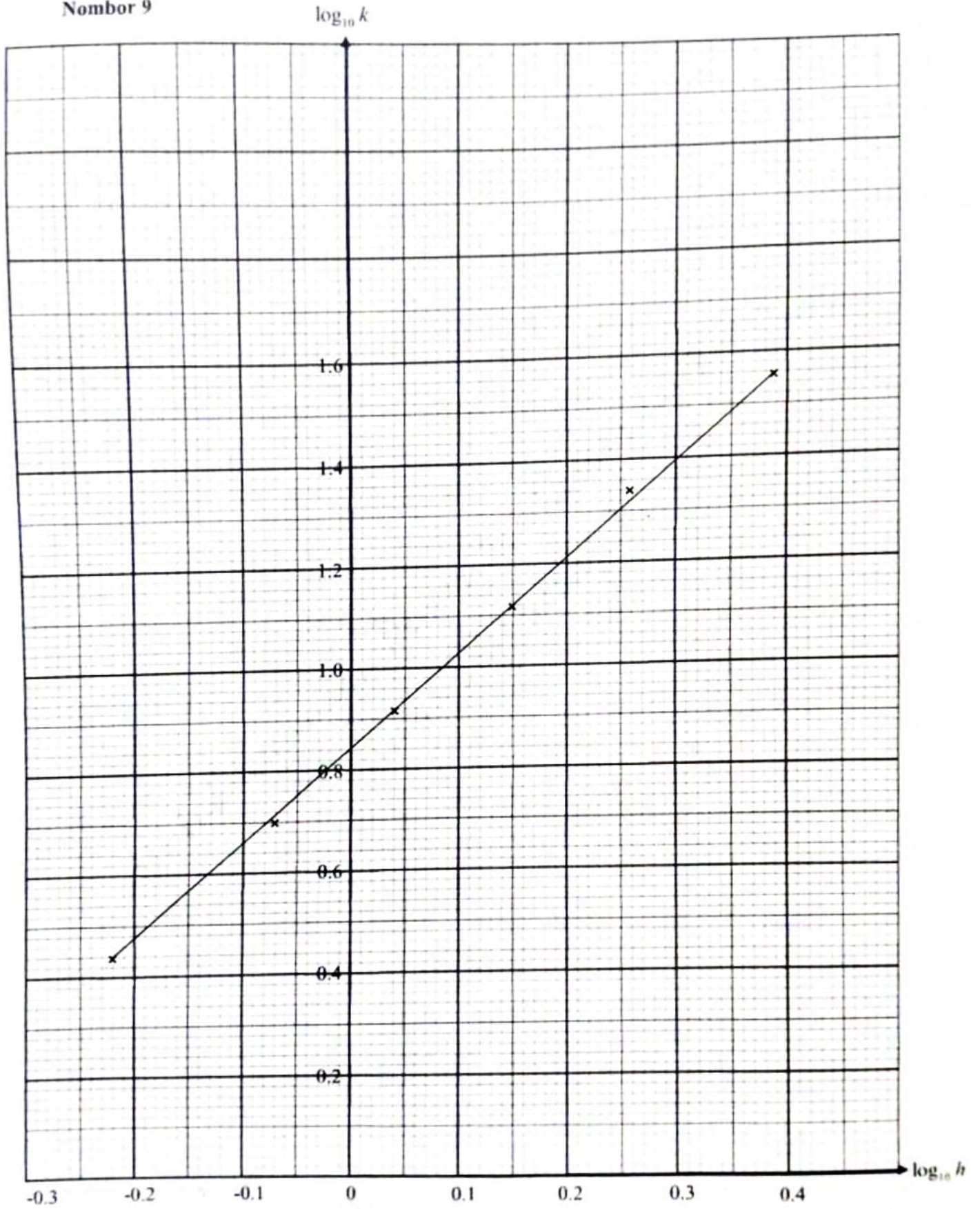
No.	Skema Pemarkahan	Sub Markah	Total Markah
1	$\frac{100}{x} + \frac{100}{y} = 2.5$ $x = 20 + y$ $40y + 40(20 + y) = y(20 + y)$ $y = \frac{-(-60) \pm \sqrt{(-60)^2 - 4(1)(-800)}}{2}$ $y = 71.23, y = -11.23$ $x = 91.23, x = -8.77$ <p>Masa = 1.10 saat</p>	P1 K1 K1 K1 N1 N1 N1	7
2(a)(i)	$f(3) = \ln(4(3) - 2)$ 2.303	K1 N1	7
(ii)	$\ln(4x - 2) > 5$ $4x - 2 > e^5$ $x > 37.60$	K1 N1	
(b)	$(m^{\frac{1}{3}})^2 - 2(m^{\frac{1}{3}}) - 15 = 0 \quad \text{or let } m^{\frac{1}{3}} = x, x = 2 + \frac{15}{x}$ $(m^{\frac{1}{3}} - 5)(m^{\frac{1}{3}} + 3) = 0 \quad \text{or } (x - 5)(x + 3) = 0$ $m^{\frac{1}{3}} = 5 \text{ atau } m^{\frac{1}{3}} = -3$ $m = 125, m = -27$	K1 K1 N1	
3(a)(i)	$(x - \alpha)(x - \beta) = 0 \text{ dan}$ $x^2 - (\alpha + \beta)x + \alpha\beta = 0 \text{ atau } x^2 + \left(\frac{b}{a}\right)x + \frac{c}{a} = 0$ $\text{Guna } \alpha + \beta = -\frac{b}{a} \text{ dan } \alpha\beta = \frac{c}{a}$	K1 N1	7
(ii)	$SOR = \frac{15}{2}, POR = -3$	N1N1	
(b)	$4x^2 - 6x - 23 = 0 \text{ follow through}$ $x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(4)(-23)}}{2(4)}$ $\frac{3 \pm \sqrt{101}}{4}$	K1 K1 N1	

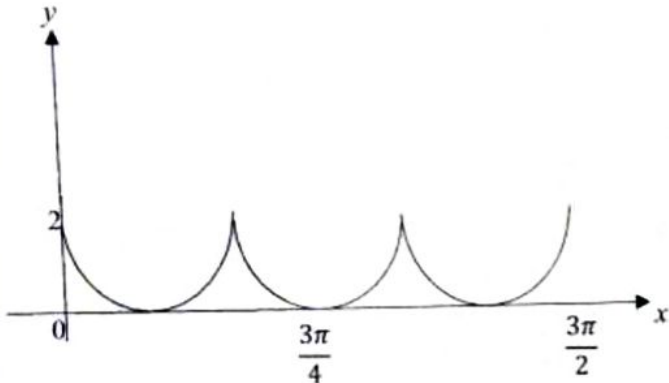
No.	Skema Pemarkahan	Sub Markah	Total Markah
4(a)	$\frac{dy}{dx} = 3x^2 - 12$ $m = 15$ <u>dan</u> ganti $x = 2$ $\frac{dy}{dx} = 3(2)^2 - 12$ $y + 9 = 15(x - 3)$ $y = 15x - 54$	K1 K1 N1 P1 K1	7
(b)	$P = y^2 - 12y + 16$ atau setara $\frac{dP}{dy} = 2y - 12$ $P = (6)^2 - 12(6) + 16$ -20	K1 K1 N1	
5(a)	$8\left(\frac{\pi}{3}\right)$ atau $8\left(60^\circ \times \frac{\pi}{180^\circ}\right)$ $8 + 4\left[8\left(\frac{\pi}{3}\right)\right] + 8$ atau $8 + 4\left[8\left(60^\circ \times \frac{\pi}{180^\circ}\right)\right] + 8$ $49.50 - 49.51 \text{ cm}$	K1 K1 N1	7
(b)	$\frac{1}{2}(8)^2\left(\frac{\pi}{3}\right)$ atau $\frac{1}{2}(8)^2(1.047)$ $\frac{1}{2}(8)(8)\sin 60^\circ$ $4\left(\frac{1}{2}(8)^2\left(\frac{\pi}{3}\right) - \frac{1}{2}(8)(8)\sin 60^\circ\right)$ $23.20 - 23.21 \text{ cm}^2$	K1 K1 K1 N1	
6 (a)	$d_1 = \log y - \log x$ dan $d_2 = \log z - \log y$ $x = \frac{y^2}{z}$, $\log y - \log \frac{y^2}{z} = \log z - \log y$ atau setara $d_1 = d_2$	K1 N1 K1	7
(b)(i)	$T_{10} = 1(2)^9$ 512	N1 K1	
(ii)	$\frac{1(2^n - 1)}{2 - 1} = 16383$ $n \log_2 2 = \log_2 16384$ 14	$1638 \cdot 3 = \frac{1}{10} \times S_n$ $S_n = 16383$ $S_n = 1638 \cdot 3$ $\frac{1(2^n - 1)}{2 - 1} = \dots$ $n = 10.67$ $n = 10$	K1 K1 K1 N1

No.	Skema Pemarkahan	Sub Markah	Total Markah
7	<p> $P\left(Z > \frac{70-45}{10}\right)$ atau $P\left(Z > \frac{39-45}{10}\right)$ (a) 0.00621 \leftarrow pun terima $(Z \leq 39)$ (b) 190×0.2743 52 orang murid (N1) (c) $P\left(\frac{m-45}{10} < Z < \frac{45-45}{10}\right)$ $P\left(Z < \frac{45-45}{10}\right) - P\left(Z < \frac{m-45}{10}\right)$ atau  $\frac{m-45}{10} = -1.036 // -1.037$ $\frac{m-45}{10} = -1.037$ 34.63 // 34.64 (P1) without - (K1) with </p>	K1 N1 K1 N1 K1 K1 K1 N1	8
8(a)(i)	<p> $\overline{AC} = \overline{AO} + \overline{OC}$ atau $\overline{OD} = \overline{OA} + \overline{AD}$ $\overline{AC} = -\underline{x} + \frac{3}{5}\underline{y}$ (ii) $\overline{OD} = -\underline{x} + \frac{2}{3}(-\underline{x} + \underline{y})$ $\overline{OD} = \frac{1}{3}\underline{x} + \frac{2}{3}\underline{y}$ (b)(i) $\overline{OE} = \frac{1}{3}h\underline{x} + \frac{2}{3}h\underline{y}$ (ii) $\overline{OE} = -\underline{x} + k\left(-\underline{x} + \frac{3}{5}\underline{y}\right)$ $\overline{OE} = (1-k)\underline{x} + \frac{3}{5}k\underline{y}$ (c) $\frac{1}{3}h\underline{x} + \frac{2}{3}h\underline{y} = (1-k)\underline{x} + \frac{3}{5}k\underline{y}$ $\frac{1}{3}h = 1-k$ atau $\frac{2}{3}h = \frac{3}{5}k$ Samakan pekali \underline{x} atau \underline{y} — K1 $h = \frac{9}{13}$, $k = \frac{10}{13}$ Solve Simultaneously </p>	P1 K1 N1 K1 N1 N1 K1 K1 N1 N1	10

No.	Skema Pemarkahan	Sub Markah	Total Markah														
9(a)	<table border="1"> <tr> <td>$\log_{10} h$</td> <td>-0.22</td> <td>-0.07</td> <td>0.04</td> <td>0.15</td> <td>0.26</td> <td>0.39</td> </tr> <tr> <td>$\log_{10} k$</td> <td>0.44</td> <td>0.70</td> <td>0.92</td> <td>1.12</td> <td>1.34</td> <td>1.56</td> </tr> </table>	$\log_{10} h$	-0.22	-0.07	0.04	0.15	0.26	0.39	$\log_{10} k$	0.44	0.70	0.92	1.12	1.34	1.56	N1	10
	$\log_{10} h$	-0.22	-0.07	0.04	0.15	0.26	0.39										
	$\log_{10} k$	0.44	0.70	0.92	1.12	1.34	1.56										
	Plot $\log_{10} k$ melawan $\log_{10} h$ dengan paksi betul dan skala seragam (sekurang-kurangnya satu titik diplot betul, skala seragam dan graf garis lurus)	K1															
	Semua titik di plot betul	K1															
	Garis penyuaiian terbaik	N1															
	(b)(i) $\log_{10} k = \frac{p}{2} \log_{10} h - \log_{10} q$	P1															
	$\frac{p}{2} = \frac{1.56 - 0.44}{0.39 - (-0.22)}$	K1															
	$p = 3.672$	N1															
	(ii) $-\log_{10} q = 0.84$	K1															
$q = 0.1445$	N1																
10(a)	$A(0,1)$	P1	10														
(b)	$\frac{1}{4} \left[\frac{y^3}{3} - y \right]_1^3$ atau $\frac{1}{4} \left[\frac{y^3}{3} - y \right]_1^3$ $2(3) - \int_0^2 f(x) dx$ $\left \frac{1}{4} \left[\frac{y^3}{3} - y \right]_1^3 \right + (6-m) - \frac{1}{4} \left[\frac{y^3}{3} - y \right]_1^3$ $\left \frac{1}{4} \left(\left(\frac{3^3}{3} - 1 \right) - \left(\frac{(-1)^3}{3} - (-1) \right) \right) \right + (6-m) - \frac{1}{4} \left(\left(\frac{3^3}{3} - 3 \right) - \left(\frac{(-1)^3}{3} - 1 \right) \right)$ $\frac{14}{3} - m$	K1															
		K1															
		K1															
		K1															
		N1															
(c)	$\int_0^2 \frac{1}{4} \pi (x^4 + 4x^2 + 4) dx$ $\frac{1}{4} \pi \left[\frac{x^5}{5} + \frac{4x^3}{3} + 4x \right]_0^2$ $\frac{1}{4} \pi \left[\left(\frac{2^5}{5} + \frac{4(2)^3}{3} + 4(2) \right) - (0) \right]$ $\frac{22}{3} \pi \text{ unit}^3$ $\frac{94}{15} \pi \text{ unit}^3$	K1															
	$V = \pi y^2 dx$ (cross section) ketebalan $= \pi \int \frac{1}{4} \pi (x^4 + 4x^2 + 4) dx$	K1															
		K1															
		N1															

Nombor 9



No.	Skema Pemarkahan	Sub Markah	Total Markah
11(a)	$\frac{2 \tan \theta}{1 - \tan^2 \theta}$ (i) $\tan 2\theta$ $\tan 2\theta = \frac{\sqrt{3}}{2}$ $\angle \text{Rujukan} = 40.89^\circ$ $\theta = 20.45^\circ, 110.45^\circ, 200.45^\circ$	K1 N1 K1 N1 N1	10
(b)	 <p>Bentuk graf sinus</p> <p>$1\frac{1}{2}$ kitaran</p> <p>Amplitud = 2</p> <p>Mutlak dan anjakan 2 unit ke atas</p> <p>$0 < k < 2$</p>	P1 P1 P1 P1 N1	

No.	Skema Pemarkahan	Sub Markah	Total Markah
12(a)	$AC^2 = 12.5^2 + 8.4^2 - 2(12.5)(8.4)\cos 64^\circ$	K1	
(i)	11.61 cm	N1	
(ii)	$\frac{\sin \angle ACD}{6} = \frac{\sin 116^\circ}{11.61}$	K1	
	$\angle ACD = 27.68^\circ$	N1	
	$\angle CAD = 180^\circ - 116^\circ - 27.68^\circ$	K1	
	$\angle CAD = 36.32^\circ$	N1	
(b)(i)	$\frac{1}{2}(6)(11.608)\sin 36.32^\circ$	K1	
	20.63 cm ²	N1	
(ii)	$\frac{1}{2}(11.61)(h) = 20.63$	K1	
	3.554 cm	N1	
	<i>asal konsep betul</i>		
13(a)	$\frac{Q_{2021}}{15.50} \times 100 = 120$ atau $\frac{18.00}{Q_{2019}} \times 100 = 125$	K1	10
(i)	$Q_{2021} = \text{RM}18.60$	N1	
(ii)	$Q_{2019} = \text{RM}14.40$	N1	
(b)	$\frac{120(2) + 3x + 130(4) + 125(1)}{2 + 3 + 4 + 1} = 135$	K1	
	$x = 155$	N1	
(c)	138 atau 123.5 atau 135	P1	
	$\bar{I} = \frac{138(2) + 3(155) + 123.5(4) + 135(1)}{2 + 3 + 4 + 1}$	K1	
	$\bar{I} = 137$	N1	
(d)	$\frac{Q_{2022}}{45.30} \times 100 = 137$	K1	
	$Q_{2022} = \text{RM}62.06$	N1	

No.	Skema Pemarkahan	Sub Markah	Total Markah
14(a)	$y < 4x$ $40x + 20y \leq 1800$ $30x + 60y \geq 1500$ (b) Satu garis lurus dilukis dengan betul Ketiga-tiga garis lurus dilukis dengan betul Rantau dilorek dengan betul (c)(i) 59 (ii) Titik Minimum (6,22) $14(6) + 19.25(22)$ 507.5	N1	10
		N1	
		N1	
		K1	
		K1	
		N1	
		N1	
		N1	
		K1	
		N1	
15(a)	$\frac{dv}{dt} = 2qt$ dan $2q(2) = -4$ $q = -1$ $s = pt + (-1)\frac{t^3}{3}$ $6p + (-1)\frac{(6)^3}{3} = -48$ $p = 4$ (b) $4 + (-1)t^2 = 0$ $t = 2$ (c) $4t - \frac{t^3}{3}$ $\left[4(5) - \frac{5^3}{3}\right] - \left[4(4) - \frac{4^3}{3}\right]$ $16\frac{1}{3}$	K1	10
		N1	
		K1	
		K1	
		N1	
		K1	
		N1	
		K1	
		K1	
		N1	

Nombor 14

