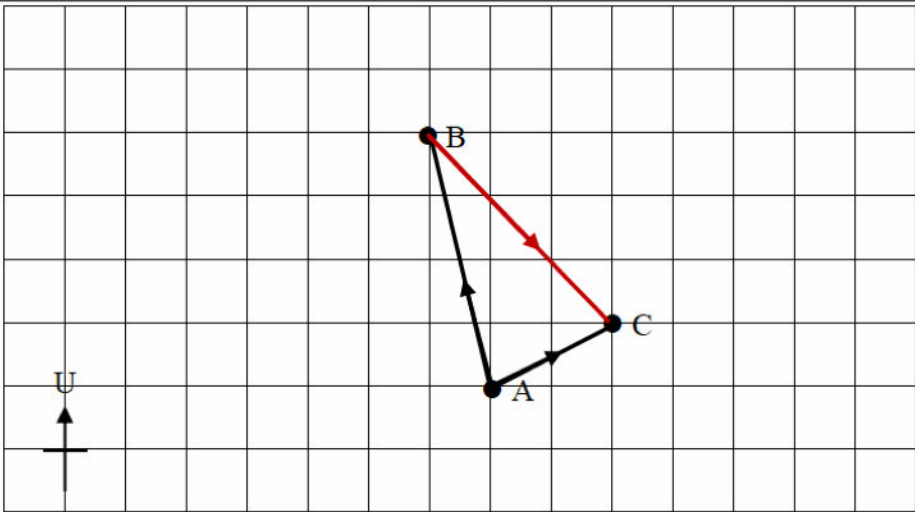


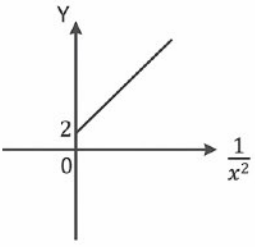
PERATURAN PEMARKAHAN PPC 2026 (Set 1)

MATEMATIK TAMBAHAN

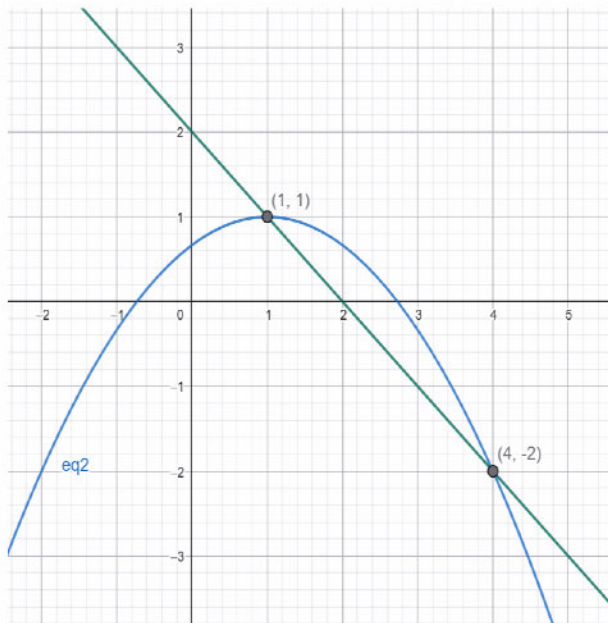
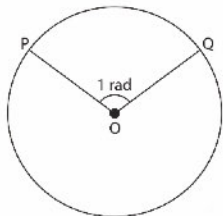
KERTAS 1



NO	SKEMA			MARKAH		
1	(a)	$m = \frac{3(2) + 2(5)}{2 + 3}$ ATAU $n = \frac{3(1) + 2(4)}{2 + 3}$		K1		
		$m = \frac{16}{5}$		N1		
		$n = \frac{11}{5}$				
	(b)	$\frac{PM}{PN} = \frac{1}{2}$ ATAU setara		P1		
		$\frac{\sqrt{(x - (-1))^2 + (y - 4)^2}}{\sqrt{(x - 5)^2 + (y - (-2))^2}} = \frac{1}{2}$ ATAU setara	NOTA: Guna rumus jarak	K1		
		$x^2 + y^2 + 6x - 12y + 13 = 0$		N1		
				5		
2	(a)	Kuantiti vektor , kuantiti ini mempunyai magnitud dan arah .			P1	
	(b)					
		• Garisan perlu ada anak panah (arah) • Mesti menggunakan alat tepi lurus				P1
		$\overrightarrow{BC} = 3\mathbf{i} - 3\mathbf{j}$				N1
	(c)	$ \overrightarrow{BC} = \sqrt{3^2 + (-3)^2}$			K1	
		$ \overrightarrow{BC} = 3\sqrt{2} // 4.243$ * tidak terima $\sqrt{18}$			N1	
		Tenggara // 135°			N1	
		• Tanda vektor mesti digunakan sekurang-kurangnya sekali • Jika tidak, SS-1				
				6		
	3	(a)	(i)	$a = \frac{28}{3}$ NMA	N1	

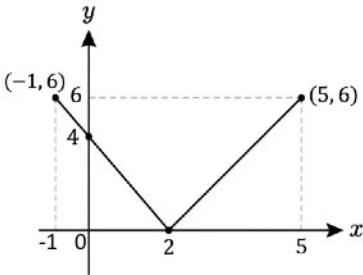
	(ii)	**seen $4^{2n-1} = 4^9$ $2n - 1 = 9$	kaedah alternatif: Guna log	K1
			$n = 5$	N1
	(b)	$S_{\infty} = \frac{0.081}{1 - \left(\frac{0.00081}{0.081}\right)}$	NOTA: $\left(\frac{0.00081}{0.081}\right)$ atau setara dilihat	K1
		$m = 471$		N1
				5
4	(a)	Tukar persamaan tak linear ke linear $\frac{y}{x^2} = 4\left(\frac{1}{x}\right) + 2$ NMA		P1
		$4X + 2 = 0$ DAN selesaikan untuk X.		K1
		Kecerunan, $m=4$ DAN pintasan-X = $-\frac{1}{2}$		N1
	(b)	 NOTA: 1. O mesti dilabel 2. semua garisan mesti dilukis dengan alat tepi lurus 3. *2 mesti dilabel 4. Label Paksi-Y boleh terima Y atau $\frac{y}{x^2}$ sahaja 5. Paksi-X hanya terima $\frac{1}{x^2}$ 6. Terima graf dengan kecerunan negatif		N1
				5
5	(a)	$-x^2 + (p - 3)x + q + 4 = 0$ ATAU setara	NOTA: tulis persamaan kuadratik dalam bentuk am	P1
		Hasil tambah punca : $p - 3$ DAN Hasil darab punca : $-q - 4$		N1
	(b)	$\alpha + \beta = 7$ ATAU $\alpha\beta = -3$ HTP/SOR = $-\frac{14}{3}$ ATAU HDP/POR = $-\frac{4}{3}$		P1 K1
		$x^2 - \left(-\frac{14}{3}\right)x + \left(-\frac{4}{3}\right) = 0$		K1
		$3x^2 + 14x - 4 = 0$ NMA		N1
				6

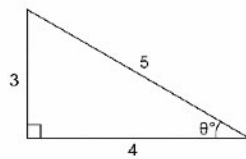


6	<table><tr><th>x</th><th>- 2</th><th>- 1</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr><tr><td>$2x + 2y = 4$</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>-1</td><td>-2</td><td>-3</td></tr><tr><td>$x^2 - 2x + 3y = 2$</td><td>-2</td><td>$-\frac{1}{3}$</td><td>$\frac{2}{3}$</td><td>1</td><td>$\frac{2}{3}$</td><td>$-\frac{1}{3}$</td><td>-2</td><td>$\frac{13}{3}$</td></tr></table>								x	- 2	- 1	0	1	2	3	4	5	$2x + 2y = 4$	4	3	2	1	0	-1	-2	-3	$x^2 - 2x + 3y = 2$	-2	$-\frac{1}{3}$	$\frac{2}{3}$	1	$\frac{2}{3}$	$-\frac{1}{3}$	-2	$\frac{13}{3}$	P1 P1
x	- 2	- 1	0	1	2	3	4	5																												
$2x + 2y = 4$	4	3	2	1	0	-1	-2	-3																												
$x^2 - 2x + 3y = 2$	-2	$-\frac{1}{3}$	$\frac{2}{3}$	1	$\frac{2}{3}$	$-\frac{1}{3}$	-2	$\frac{13}{3}$																												
 Titik persilangan : (1, 1) DAN (4, -2) NOTA N1³: 1. O mesti dilabel 2. semua garisan mesti dilukis dengan alat tepi lurus 3. skala mesti seragam pada kedua-dua paksi 4. Label Paksi-y dan Paksi-x mesti betul									N1 – Plot dan lukis graf garis lurus N1 – Plot dan lukis graf kuadratik dengan betul N1 ³ N1																											
 SERTAI TELEGRAM @exercise_students									6																											
7	(a)	 Lukis DAN label							P1																											
	(b)	$160^\circ \times \frac{3.142}{180^\circ}$ implied	RUJUKAN: 2.7929 rad mesti minimum 4 titik perpuluhan					P1																												
		$3 \times (2.7929)$	NOTA: guna rumus					K1																												
		$3 + 3 + (8.3787)$	NOTA: $OB + OA + S_{AB}$					K1																												
		$= 14.38 \text{ cm}$					N1																													
									5																											
8	(a)	$\frac{-(x - 5)}{(x - 5)(x + 5)}$							K1																											
		$-\frac{1}{10}$							N1																											



	(b)	$\lim_{\delta x \rightarrow 0} \frac{4(x + \delta x)^2 - 3(x + \delta x) + 7 - (4x^2 - 3x + 7)}{\delta x}$	Guna $f'(x)$ $= \lim_{\delta x \rightarrow 0} \frac{f(x + \delta x) - f(x)}{\delta x}$	K1
		$f'(x) = 8x - 3$		N1
				4
9		$\int_1^0 3f(x)dx - \int_1^0 8x dx$ ATAU $3 \int_1^0 f(x)dx$		P1
		$-3 \int_0^1 f(x)dx$ DAN $[4x^2]_1^0$	NOTA: Untuk pengamiran, kuasa naik 1. Abaikan 4.	K1
		Ganti $\int_0^1 f(x)dx = -3$ DAN Gantikan had pengamiran 0 dan 1	RUJUKAN: $-3(-3) - [(4(0)^2 - 4(1)^2)]$	K1
		13		N1
				4
10	(a)	$3^{3x} \times 3^{3y}$ DILIHAT	GUNA: $a^{m+n} = a^m \times a^n$	P1
		Ganti $3^{3x} = p$ DAN $3^y = q$	RUJUKAN: $p \times q^3 = 10 + q$	K1
		$p = \frac{10}{(q^3 - 1)}$		N1
	(b)	$(5 - \sqrt{2})^2$ DILIHAT		P1
		$(5 - \sqrt{2})^2(5 - \sqrt{2})$ DAN SETARA	NOTA: Cari luas	P1
		$27(5) - 27\sqrt{2} - 50\sqrt{2} + 10(2)$	NOTA: Kembangan sekurang-kurangnya 4 sebutan	K1
		$155 - 77\sqrt{2}$		N1
				7
	(a)	diskret DAN boleh dibilang.		P1
		$P\left(Z < \frac{1.5 - \mu}{\sigma}\right) = 0.0228$ ATAU $P\left(Z > \frac{3.5 - \mu}{\sigma}\right) = 0.252$		P1
		$z = -2$ ATAU $z = 0.667$		K1
		$\frac{1.5 - \mu}{\sigma} = -2$ ATAU $\frac{3.5 - \mu}{\sigma} = 0.667$		K1
		Selesaikan persamaan serentak	NOTA: -Hapus μ atau σ	K1
11		$\sigma = 0.7499$ DAN $\mu = 2.9998$ // 3.000		N1

				6
12	(a)	(i)	24 NMA	N1
		(ii)	$5! \times \frac{3!}{2!}$	NOTA: 2 tidak diterima Terima nPr K1
			360	N1
	(b)		${}^5C_2 \times {}^4C_1$ ATAU ${}^5C_1 \times {}^4C_2$	P1
			$({}^5C_2 \times {}^4C_1) + ({}^5C_1 \times {}^4C_2)$	NOTA: Terima 2 kes ini sahaja K1
			70	N1
				6
13	(a)		$f^{-1}(x) = \frac{x+4}{2}$	K1
			$g(x) = \frac{2}{5 * (\frac{x+4}{2}) - 4}$	NOTA: Lakukan $gf[f^{-1}(x)]$ K1
			$g(x) = \frac{4}{5x+12}, x \neq -\frac{12}{5}$	NOTA: $x \neq -\frac{12}{5}$ wajib ada N1
	(b)	(i)	 NOTA untuk P1² 1. 0, 2, 4 mesti dilabel 2. semua garisan mesti dilukis dengan alat tepi lurus 3. Graf mesti pantul pada x=2 4. Graf dalam domain $-1 \leq x \leq 5$ 5. (-1, 6) dan (5, 6) mesti dilabel ATAU dilukis unjuran (mesti ada nombor pada paksi) 6. Paksi-x dan paksi-y mesti dilabel	P1 Bentuk V P1²
			$0 \leq f(x) \leq 6$	N1
		(ii)	$2x - 4 > 2$ DAN $2x - 4 < -2$ $-1 \leq x < 1, 3 < x \leq 5$	K1 N1
				8
14	(a)		$(3\underline{i} + 2\underline{j})t$ ATAU $3t\underline{i} + 2t\underline{j}$	K1
			$(20\underline{i} + 20\underline{j}) + (3t\underline{i} + 2t\underline{j})$	K1
			$(20 + 3t)\underline{i} + (20 + 2t)\underline{j} // (\frac{20+3t}{20+2t})$	NOTA: MESTI dalam bentuk $a\underline{i} + b\underline{j}$ ATAU vektor lajur $(\frac{a}{b})$ N1
	(b)		$5t = 20 + 3t$ ATAU $4t = 20 + 2t$	NOTA: $s_Q = s_P$ K1

		$5t\underline{i} + 4t\underline{j} = (20 + 3t)\underline{i} + (20 + 2t)\underline{j}$		
		$t = 10$	N1	
	(c)	$\overrightarrow{OP} = 5(10)\underline{i} + 4(10)\underline{j}$ ATAU $\overrightarrow{OQ} = (20 + 3(10))\underline{i} + (20 + 2(10))\underline{j}$	K1	
		$\sqrt{50^2 + 40^2}$	K1	
		$64.03 \ // \ 10\sqrt{41}$	N1	
			8	
15	(a)	$\cos \theta = \frac{4}{5}$	NOTA: segi tiga WAJIB dilukis dan dilabel 	N1
	(b)	$2\left(\frac{3}{5}\right)\left(\frac{4}{5}\right)$ $\frac{24}{25}$	NOTA: Guna rumus $\sin 2\theta = 2 \sin \theta \cos \theta$	K1 N1
		$\left(\frac{4}{5}\right)^2 - \left(\frac{3}{5}\right)^2$	NOTA: $\cos 2\theta = \cos^2 \theta - \sin^2 \theta$	K1
		$\frac{7}{25}$		N1
	(c)	$\sin (2\theta + \theta) = \sin 2\theta \cos \theta + \cos 2\theta \sin \theta$ DAN SETARA	K1	
		$\left(\frac{24}{25}\right)\left(\frac{4}{5}\right) + \left(\frac{7}{25}\right)\left(\frac{3}{5}\right)$	K1	
		$\frac{117}{125}$	N1	
			8	

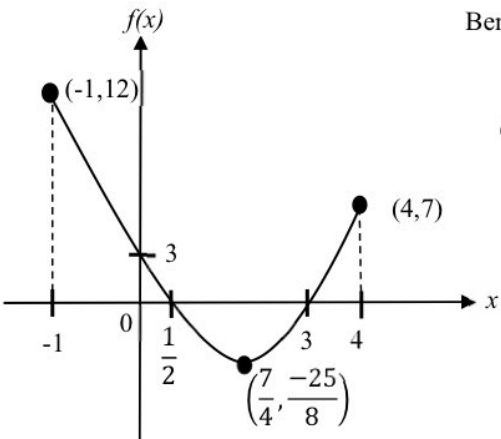


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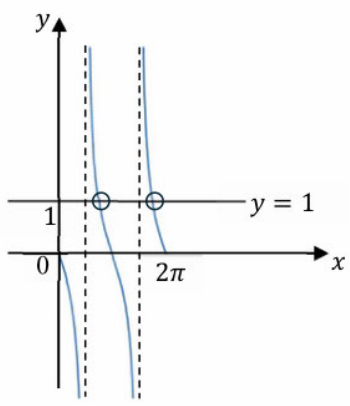
PEPERIKSAAN PERCUBAAN SPM 2026
MATEMATIK TAMBAHAN (KERTAS 2) – SET 1
SKEMA PEMARKAHAN



NO. SOALAN	SKEMA	MARKAH
1	ALTERNATIF A	
	Membentuk mana-mana persamaan $x + y + z = 2150$(1) $2x + 3y + 4z = 6850$(2) $x + 1.5y + 1.5z = 2975$(3)	P1
	Ketiga-tiga persamaan betul	P1
	Hapuskan anu pertama dengan menggunakan kaedah penggantian atau penghapusan	K1
	Persamaan (3) – 1 $0.5y + 0.5z = 825$(4)	
	Hapuskan anu kedua dengan menggunakan kaedah penggantian atau penghapusan	K1
	Persamaan (1) $\times$ 2 $2x + 2y + 2z = 4300$(5) $2x + 3y + 4z = 6850$(2)	
	Persamaan (5) – (2) $y + 2z = 2550$(6)	
	Persamaan (4) $\times$ 2 $y + z = 1650$(7)	
	Persamaan (6) – (7) $z = 900$	N1
	$y = 750$ $x = 500$	N1 N1
1	ALTERNATIF B	
	Membentuk mana-mana persamaan $x + y + z = 2150$(1) $2x + 3y + 4z = 6850$(2) $x + 1.5y + 1.5z = 2975$(3)	P1
	Ketiga-tiga persamaan betul	P1
	Hapuskan dua anu pertama dengan menggunakan kaedah penghapusan	K1
	Persamaan (3) $\times$ 2 : $2x + 3y + 3z = 5950$(4)	
	Persamaan (2) – (4) $z = 900$	N1
	Hapuskan anu kedua dengan menggunakan kaedah penggantian atau penghapusan	K1
	$y = 750$ @ $x = 500$	N1
	$x = 500$ @ $y = 750$	N1

2	(a)	$f(x) = 2[x^2 - \frac{7}{2}x + \frac{3}{2}]$	
		$f(x) = 2[x^2 - \frac{7}{2}x + (\frac{-\frac{7}{2}}{2})^2 - (\frac{-\frac{7}{2}}{2})^2 + \frac{3}{2}]$	K1
		$f(x) = 2[(x - \frac{7}{4})^2 - (\frac{-7}{4})^2 + \frac{3}{2}]$	K1
		$f(x) = 2[(x - \frac{7}{4})^2 - \frac{25}{16}]$	
		$f(x) = 2(x - \frac{7}{4})^2 - \frac{25}{8}$	N1
		Paksi simetri $x = \frac{7}{4}$	N
	(b)	 Bentuk U, Paksi-paksi guna alat tepi lurus $(-1, 12)$, $(4, 7)$, titik asalan & $(\frac{7}{4}, \frac{-25}{8})$ Graf dalam domain $-1 \leq x \leq 4$.	P1 P1
3	(a)	(i) Hukum segitiga $\overrightarrow{CA}$ atau $\overrightarrow{BD}$ $\overrightarrow{CA} = \overrightarrow{CD} + \overrightarrow{DA}$ $= \underline{x} + 4\underline{y}$	P1 N1
		(ii) $\overrightarrow{BD} = \overrightarrow{BA} + \overrightarrow{AD}$ $= 5\underline{CD} + (-4\underline{y})$ $= 5\underline{x} - 4\underline{y}$	N1
	(b)	(i) $\overrightarrow{AE} = h\overrightarrow{AC}$ $= h(-\underline{x} - 4\underline{y})$ $= -h\underline{x} - 4h\underline{y}$	N1
		(ii) $\overrightarrow{AE} = \overrightarrow{AB} + \overrightarrow{BE}$ $= -5\underline{x} + k\overrightarrow{BD}$ $= -5\underline{x} + k(5\underline{x} - 4\underline{y})$ $= (-5 + 5k)\underline{x} - 4k\underline{y}$	K1 N1
	(c)	$-4h = -4k$ $\frac{1}{1} = \frac{k}{h}$ $k : h = 1 : 1$	K1 N1



4	(a)	$V = \frac{1}{3}\pi r^2(12 - r)$ $= 4\pi r^2 - \frac{1}{3}\pi r^3$	
		$\frac{dV}{dr} = 8\pi r - \pi r^2$ $8\pi r - \pi r^2 = 0$ $\pi r(8 - r) = 0$ $r = 0, r = 8$ $\therefore r = 8$	K1 N1
		$V_{max} = 4\pi(8)^2 - \frac{1}{3}\pi(8)^3$ $V_{max} = 85\frac{1}{3}\pi @ \frac{256}{3}\pi$ ganti $r = 8$	K1 N1
	(b)	$\frac{dr}{dt} = \frac{dr}{dV} \times \frac{dV}{dt}$ $\frac{dr}{dt} = \frac{1}{8\pi(2) - \pi(2)^2} \times 2\pi$	K1
		$\frac{dr}{dt} = \frac{1}{6} @ 0.1667$	N1
5	(a)	Guna mana-mana rumus sudut berganda	K1
		$1 - (1 - 2\sin^2 x) + 2\sin x \cos x \quad \text{ATAU}$ $1 + (1 - 2\sin^2 x) + 2\sin x \cos x$	K1
		$\frac{\sin x}{\cos x}$ $\tan x$	N1
	(b)	(i)	
		 Bentuk graf tangen negatif / Terima graf tangen positif 1 kitaran dan bersama 2 asimptot dan label pada paksi	P1 P1
		(ii) $y = 1$	P1
		Lukis garis lurus $y = 1$	K1
		2 bilangan penyelesaian	N1

6	(a)	Jejari sektor bulatan = $\sqrt{7^2 + 24^2} = 25$ $2(3.142)(7) = (25)\theta$ $\theta = 1.760 \text{ rad}$ $\cos(\pi - 1.760) \text{ rad} = \frac{A}{25}$ $A = 4.671$ Panjang = $4.671 + 25$ $= 29.671$ Panjang minimum = 30 cm	K1 K1 K1 K1 N1
	(b)	$\frac{1}{2}(25^2)(1.76)$ $25 \times 30 - 550$ $= 200$	K1 K1 N1
	(c)	$550 \times 0.05 = 27.50 (< 25)$ Maka, bajet yang diberi tidak mencukupi	N1
7	(a)	$T_1 = S_1$ $S_1 = 2(1)^2 - 3(1)$ $= 2 - 3$ $= -1$	N1
	(b)	$S_7 = 2(7)^2 - 3(7) = 98 - 21 = 77$ ATAU $S_6 = 2(6)^2 - 3(6) = 72 - 18 = 54$ Sebutan ke-7 $T_7 = S_7 - S_6$ $T_7 = 77 - 54$ $= 23$	K1 K1 N1
	(c)	Hasil tambah sebutan ke-4 hingga ke-7 $S_3 = 2(3)^2 - 3(3) = 18 - 9 = 9$ $T_4 + \dots + T_7 = S_7 - S_3$ $= 77 - 9$ $= 68$	K1 N1

8	(a)	Beza $y = x^2 \Rightarrow \frac{dy}{dx} = 2x$ & Guna $m_T \times m_N = -1 \Rightarrow m_N = -\frac{1}{6}$ Gantikan (3,9) ke dalam $y = -\frac{1}{6}x + c$ & selesaikan untuk c ATAU Gantikan (3,9) dalam $(y - y_1) = -\frac{1}{6}(x - x_1)$	K1 K1
		$y = \frac{x}{6} + \frac{57}{6} // x + 6y - 57 = 0$	N1
	(b)	Cari luas poligon , $A_1 = \frac{1}{2}(1+9)(2)$ ATAU Kamir $\int 4x - 3$ & Guna had $\int_1^3$	K1
		Kamir $\int x^2$ terhadap $x \Rightarrow A_2 = \frac{x^3}{3}$ DAN	K1
		Guna had $\int_1^3$ ke dalam A_2	
		$A_1 - A_2$	K1
		$\frac{4}{3}$	N1
	(c)	Kamir $\int (4x - 3)^2$ terhadap x DAN guna had $\int_1^3$ ke dalam *kamiran $V_1 = \frac{182}{3}\pi // 60\frac{2}{3}\pi // 60.667\pi$ ATAU Kamir $\int (x^2)^2$ terhadap x DAN guna had $\int_1^3$ ke dalam *kamiran $V_2 = \frac{242}{5}\pi // 48\frac{2}{5}\pi // 48.4\pi$	K1
		$\frac{1}{2}(V_1 - V_2)$	K1
		$\frac{92}{15}\pi$	N1
9	(a)	(i) ${}^{10}C_0(0.7)^0(0.3)^{10}$ ATAU ${}^{10}C_1(0.7)^1(0.3)^9$ ATAU ${}^{10}C_2(0.7)^2(0.3)^8$ $= 0.0015904$	K1 N1
		(ii) Bilangan murid $= \frac{280}{0.7}$ $= 400$	K1 N1



9	(b)	(i) $P(X \geq 40) = P\left(Z \geq \frac{40-45}{25}\right)$ $= P(Z \geq -0.2)$ $= 1 - P(Z < -0.2)$ $= 1 - 0.4207$ $= 0.5793$ $0.5793 \times 1000 \approx 579$	P1 K1 N1
		(ii) $P(X \geq m) = P\left(Z \geq \frac{m-45}{25}\right) = 0.16$ $\frac{m-45}{25} = 0.994$ $m = 69.85$	P1 K1 N1
10	(a)	Titik Tengah AC = titik Tengah BD / <i>midpoint of AC = midpoint of BD</i> $\left(\frac{0+7}{2}, \frac{1+(-1)}{2}\right) = \left(\frac{2+h}{2}, \frac{k+(-6)}{2}\right)$	K1
		$\left(\frac{7}{2}, 0\right) = \left(\frac{2+h}{2}, \frac{k-6}{2}\right)$	
		$\frac{7}{2} = \frac{2+h}{2}, 0 = \frac{k-6}{2}$	K1
		$h = 5, k = 6$	N1
		ATAU / OR	
		$m_{AD} = m_{BC} \quad m_{AB} = m_{CD}$ $\frac{k-1}{h-0} = \frac{-1-(-6)}{7-2} \quad \text{ATAU / OR} \quad \frac{1-(-6)}{0-2} = \frac{k-(-1)}{h-7}$	K1
	(b)	Penggantian bagi persamaan serentak / <i>Substitution of simultaneous equations</i> $7(k-1) = -2k + 47$ / setara / <i>equivalent</i>	K1
		$h = 5, k = 6$	N1
		Luas / Area $= \frac{1}{2} \begin{vmatrix} 0 & 2 & 7 & 5 & 0 \\ 1 & -6 & -1 & 6 & 1 \end{vmatrix}$ $= \frac{1}{2} [0(-6) + 2(-1) + 7(6) + 5(1)] - [1(2) + (-6)(7) + (-1)(5) + 6(0)]$ / setara / <i>equivalent</i> $= 45 \text{ unit}^2$	K1
			N1
		$m_{BC} = \frac{-1-(-6)}{7-2} = 1 \quad \text{DAN / AND} \quad \text{titik tengah / midpoint} = \left(\frac{7}{2}, 0\right)$	K1
		$y - 0 = 1\left(x - \frac{7}{2}\right) \quad \text{ATAU} \quad 0 = 1\left(\frac{7}{2}\right) + c$ $c = -\frac{7}{2}$	K1
		$y = x - \frac{7}{2} / 2x - 2y = 7 / 2x - 2y - 7 = 0$	N1
	(d)	$2AP = PD$ $2\sqrt{(x-0)^2 + (y-1)^2} = \sqrt{(x-5)^2 + (y-6)^2}$	K1
		$3x^2 + 3y^2 + 10x + 4y - 57 = 0$	N1



11	(a)	<table><tr><td>x</td><td>0.40</td><td>0.80</td><td>1.00</td><td>1.20</td><td>1.40</td><td>1.60</td></tr><tr><td>$\log_{10} y$</td><td>0.80</td><td>1.07</td><td>1.21</td><td>1.38</td><td>1.45</td><td>1.63</td></tr></table>	x	0.40	0.80	1.00	1.20	1.40	1.60	$\log_{10} y$	0.80	1.07	1.21	1.38	1.45	1.63	N1
x	0.40	0.80	1.00	1.20	1.40	1.60											
$\log_{10} y$	0.80	1.07	1.21	1.38	1.45	1.63											
	(b)	Rujuk pada graf (i) Paksi-paksi betul dan skala seragam dari titik pertama hingga titik terakhir sekurang-kurangnya satu titik diplot betul (ii) 6 titik diplot dengan betul (iii) Garis lurus penyuaiian terbaik 	K1 N1 N1														
	(c)	(i) $\log_{10} y = 0.75$ $y = 5.623$	N1														

11	(c)	(ii) $\log_{10} y = x \log_{10}(q + 1) + \log_{10} p$ $\log_{10}(q + 1) = \frac{1.07 - 0.51}{0.8 - 0}$ $q = 4.012$ $\log_{10} p = 0.51 \quad \text{baca dari graf}$ $p = 3.236$	P1 K1 N1 K1 N1
12	(a)	(i) $\frac{SU}{\sin 60^\circ} = \frac{8.5}{\sin 100^\circ}$ $SU = 7.475$	K1 N1
		(ii) $SQ = \sqrt{8.5^2 + 6.4^2}$ $= 10.64$ ATAU $QU = \sqrt{2.952^2 + 6.4^2}$ $= 7.048$ $\frac{RU}{\sin 20^\circ} = \frac{8.5}{\sin 100^\circ}$ $= 2.952$ DAN $S = \frac{7.475 + 10.64 + 7.048}{2}$ $= 12.58$ $\text{Luas} = \sqrt{12.58(12.58 - 7.475)(12.58 - 10.64)(12.58 - 7.048)}$ $= 26.25$	P1 K1 K1 N1
		(b) $\frac{\sin \angle UVQ}{7.048} = \frac{\sin 20^\circ}{4}$ $\angle UVQ = 142.94^\circ \text{ (cakah sahaja kerana panjang minimum)}$ $\angle VUQ = 180^\circ - 142.94^\circ - 20^\circ$ $= 17.06^\circ$ $\frac{QV}{\sin 17.06^\circ} = \frac{4}{\sin 20^\circ}$ $= 3.431$	K1 N1 K1 N1
13	(a)	Guna rumus indeks harga $\frac{x}{40} \times 100 = 128$ $x = \text{RM } 51.20$ $\frac{y}{50} \times 100 = 130$ $y = \text{RM } 65.00$	K1 N1 N1

13	(b) (i) $\frac{128(3)+130(4)+105(x)+145(2)}{3+4+x+2} = 125.75$ $x = 3$ (ii) $\frac{128(95)}{P} = 100$ @ $\frac{145(115)}{S} = 100$ $P = 121.60$ $S = 166.75$ $\frac{121.60(3)+130(4)+105(3)+166.75(2)}{3+4+3+2} = 127.77$ (iii) $\frac{x}{75} \times 100 = 127.77$ $x = \text{RM } 95.83$	K1 N1 K1 K1 N1 K1 N1
14	(a) $x + y \leq 160$ @ setara NMA $y < 3x$ @ setara NMA $y \geq x + 10$ @ setara NMA # Nota Simbol = tidak digunakan N1¹N1²N1³N0⁶N0¹⁰	N1¹ N1² N1³
	(b) Sekurang-kurangnya satu garis lurus dilukis dengan betul At least one straight line drawn correctly Semua garis lurus dilukis dengan betul All straight lines drawn correctly Rantau R dilorek dengan betul Region R shaded correctly	K1⁴ N1⁵ N1⁶
	(c) (i) $y = 89$ (ii) Lukis $50x + 80y = k$ dan ganti mana2 titik integer dalam rantau* ke dalam $50x + 80y = k$ Ganti Titik maksimum (41,119) Keuntungan maksimum RM11,570	N1⁷ K1⁸ K1⁹ N1¹⁰



15	(a)	$t = 0,$ $v = 9 + 6(0) - 3(0)^2$ $v = 9$	N1
	(b)	$v = 0,$ $9 + 6t - 3t^2 = 0$ $t^2 - 2t - 3 = 0$ $(t - 3)(t + 1) = 0$ $t = 3$	K1 K1 N1
	(c)	$v = 9 + 6t - 3t^2$ $a = \frac{dv}{dt} = 6 - 6t$	K1
		$a = 0$ $6 - 6t = 0$ $t = 1$	K1
		$v = 9 + 6(1) - 3(1)^2$ $v = 12$	N1
	(d)	$s = \int (9 + 6t - 3t^2) dt$ $s = 9t + \frac{6t^2}{2} - \frac{3t^3}{3} + c$ $s = 9t + 3t^2 - t^3 + c$	K1
		$t = 3$ $s_3 = 9(3) + 3(3)^2 - (3)^3$ $s_3 = 27$	
		$t = 5$ $s_3 = 9(5) + 3(5)^2 - (5)^3$ $s_3 = -5$	
		Jumlah jarak $= s_3 - s_0 + s_5 - s_3 $ $= 27 - 0 + -5 - 27 $ $= 59$	K1 N1

