MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN
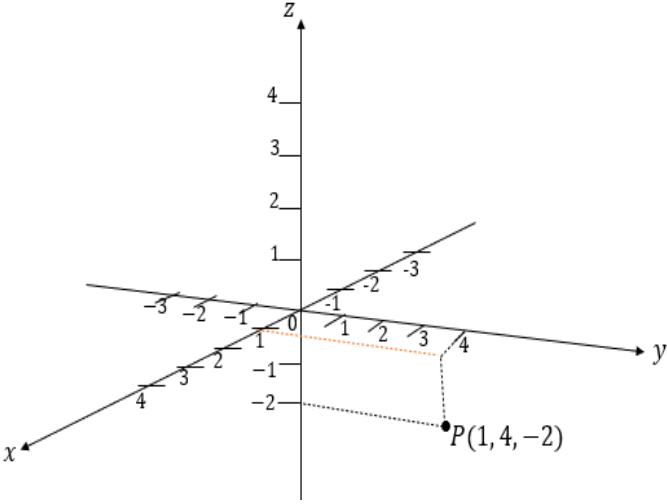

MODUL KOLEKSI ITEM
PERCUBAAN SPM
2024

MATEMATIK TAMBAHAN
KERTAS 1

UNTUK KEGUNAAN PEMERIKSA SAHAJA

SKEMA PEMARKAHAN

NO.			PERATURAN PEMARKAHAN	SUB-MARKAH	MARKAH PENUH
1			Hasil darab semua sebutan untuk menghapuskan satu anu OR Ungkapkan x dalam sebutan y dan z @ Ungkapkan y dalam sebutan x dan z @ Ungkapkan z dalam sebutan x dan y	1	
			Hapus anu pertama dengan pengantian OR penghapusan	1	
			$x = 1 \ @ \ y = 4 \ @ \ z = -2$	1	
			$x = 1 \ DAN \ z = -2 \ @$ $\qquad y = 4 \ DAN \ z = -2 \ @$ $x = 1 \ DAN \ y = 4$	1	
			Label paksi- x, paksi-y dan paksi-z betul	1	
			Titik P(1, 4, -2) ditanda betul	1	
					6
2	(a)		$P(1, 2)$	1	
			$Q(3, 5)$	1	
			NMA(No multiple answers)		

	(b)		$log_2 y = \frac{3}{2}x + c$ atau $log_2 y = mx + \frac{1}{2}$	1	
			$log_2 y = \frac{3}{2}x + \frac{1}{2}$	1	
			$y = 2^{\frac{3x+1}{2}}$	1	5
3	(a)		$y = \dfrac{2}{x+6}$	1	
			$g^{-n}(x) = \dfrac{2}{x+6}\ , x \neq -6$	1	
	(b)		$\dfrac{2-6y}{y} \geq 5$	1	
			$Julat\ , g^n(x)\ \leq\ \dfrac{2}{11}$	1	
	(c)		$h^{-n}\left(\frac{3}{2}\right) = 3$ atau seen 3	1	
			$x = \dfrac{2}{11}$	1	6
4	(a)		$\dfrac{-(-5) \pm \sqrt{(-5)^2 - 4(3)(3)}}{2(3)}$	1	
			$\dfrac{5 \pm \sqrt{11}i}{6}$	1	
			$\dfrac{5}{6} + \dfrac{\sqrt{11}i}{6}\, dan\ \dfrac{5}{6} - \dfrac{\sqrt{11}i}{6}$	1	
	(b)		$hx^2 + (k - 2h)x + h + k = 0$ atau setara	1	
			$(-2h + k)^2 - 4(h)(h + k) = 0$	1	
			$h : k = 1 : 8$	1	6
5	(a)		$3^x.3^1 - 28(3^{\frac{x}{2}}) + 9 = 0$	1	
			$(3^{\frac{x}{2}})^2.3^1 - 28(3^{\frac{x}{2}}) + 9 = 0$		
			$\left(3^{\frac{x}{2}} - 9\right)\left(3(3^{\frac{x}{2}}) - 1\right) = 0\ atau\ Setara$	1	
			$x = 4$	1	

	(b)		$P = 3^a$ and $Q = 9^b$	1	
			$\left(\dfrac{9^b}{3^a}\right)^2$	1	6
			3^{4b-2a}	1	
6			$s = j(2\pi - \theta)$ or $perimeter = 2j + j\theta$	1	
			$\dfrac{j(2\pi - \theta)}{2j + j\theta} = \dfrac{3}{2}$	1	
			$1.3136\,rad \times \dfrac{180°}{3.142}$	1	4
			$75.25°$	1	
7	(a)		0	1	
			NMA		
	(b)		$\left[-\frac{2}{3}x^3 + 6x^2 - 21x\right]_1^2$ atau		
			$\left(-\frac{2}{3}(2)^3 + 6(2)^2 - 21(2)\right) - \left(-\frac{2}{3}(1)^3 + 6(1)^2 - 21(1)\right)$	1	
			$-\dfrac{23}{3} = 2m - 1$	1	4
			$m = -\dfrac{10}{3}$	1	
8	(a)		$\begin{pmatrix} -6 \\ 12 \end{pmatrix} - 4\begin{pmatrix} 2 \\ 3 \end{pmatrix}$	1	
			$(-14, 0)$	1	
	(b)		$\sqrt{(-8)^2 + (-12)^2}$	1	
			$4\sqrt{13}$	1	
	(c)		$-\dfrac{2}{\sqrt{13}}i - \dfrac{3}{\sqrt{13}}j$ or $-\dfrac{2\sqrt{13}}{13}i - \dfrac{3\sqrt{13}}{13}j$	1	5
9	(a)		$z = \dfrac{63.2 - 48}{12}$	1	
			$z = 1.267$	1	
	(b)		Lakar graf taburan normal dan lorek kawasan yang betul (catatan: mesti menggunakan alat tepi lurus untuk kedua-dua paksi)		

			$\dfrac{k-48}{12}=-0.39$	1	4
			$k=43.32$	1	
10	(a)		$P(X=r)={}^6C_r\left(\dfrac{1}{5}\right)^r\left(\dfrac{4}{5}\right)^{6-r}$ or ${}^6C_r(0.2)^r(0.8)^{6-r}$	1	
			$P(X\geq3)=P(X=3)+P(X=4)+P(X=5)+P(X=6)$ Atau $P(X\geq3)=1-P(X=0)-P(X=1)-P(X=2)$	1	4
			0.09888	1	
	(b)		$\sqrt{705\times0.2\times0.8}=10.621$	1	
11	(a)	(i)	$-kos\,45$	1	
			$-\dfrac{1}{\sqrt{2}}$	1	
		(ii)	$-\dfrac{1}{\tan 60}$ atau $-\dfrac{1}{\tan\frac{\pi}{3}}$	1	
			$-\dfrac{1}{\sqrt{3}}$	1	
	(b)		$3\sin 2x-2\sin x-1=0$	1	
			$Sin\,x=-\dfrac{1}{3}$ dan $\sin x=1$	1	
			$x=19.47^0$ atau $x=90^0$ (sudut rujukan) ATAU $x=0.1082\pi,\,x=\dfrac{1}{2}\pi$	1	8
			$x=1.108\pi,\,1.891\,\pi,\,0.5\,\pi$	1	
12	(a)	(i)	${}^{10}C_4=210$	1	
		(ii)	${}^4C_4\times{}^6C_1$	1	
			6	1	
	(b)	(i)	$\dfrac{8!}{2!}=20160$	1	

		(ii)	$\dfrac{4! \times 5!}{2!}$	1	
			1440	1	6
13	(a)		$S_4 = \dfrac{4}{2}\left[2a+(4-1)d\right] = 34$	1	
			$S_{5\to 8} = 8a+28d = 116$ @ $S_{5\to 8} = 4a+22d = 82$	1	
			$a = 4$ *dan* $d = 3$	1	
	(b)		Tangki 1: a = 3500 ml dan r = 88% = 0.88		
			Tangki 2: a = 2700 ml dan r= 91% = 0.91		
			$T_n(\text{Tangki}\,1) < T_n(\text{Tangki}\,2)$		
			$3500\,(0.88)^{n-1} < 2700\,(0.91)^{n-1}$		
			$\dfrac{3500}{2700} < \left(\dfrac{0.91}{0.88}\right)^{n-1}$	1	8
			Guna hukum Log		
			$\log_{10}\left(\dfrac{3500}{2700}\right) < (n-1)\log_{10}\left(\dfrac{0.91}{0.88}\right)$	1	
			$n > 8.7$		
			$n = 9$	1	
			20 minit $\times (9-1)$ = 160 minit = 2 jam 40 minit	1	
			1.00 tgh + 2 jam 40 minit = 3.40 petang	1	
14	(a)		$\theta_2 = 90^0 + \theta_1$	1	
			$\tan\theta_2 = -\dfrac{1}{\tan\theta_1}$	1	
			$m_1 \times m_2 = -1$	1	
	(b)	(i)	$\left(-\dfrac{3}{2}\right)m_2 = -1$	1	
			$y - 5 = \dfrac{2}{3}(x-3)$	1	
			$y = \dfrac{2}{3}x + 3$	1	
		(ii)	$\dfrac{2}{3}x = -3$	1	
			$\left(-\dfrac{9}{2}, 0\right)$	1	8

15	(a)	(i)	$\frac{\delta y}{\delta x} = \frac{3(x+\delta x)^2 + 1 - (3x^2 + 1)}{\delta x}$	1	
			$\frac{dy}{dx} = \underset{\delta x \to 0}{had} (6x + 3\delta x)$	1	
			$\frac{dy}{dx} = 6x$	1	
		(ii)	$\frac{dy}{dx} = x - 3$	1	
	(b)		$\frac{dV}{dr} = 4\pi r^2$ *atau* $\frac{dV}{dt} = -2.5\pi$	1	
			$4\pi(5)^2$	1	8
			$\frac{dr}{dt} = \frac{1}{100\pi} \times -2.5\pi$	1	
			-0.025	1	