



MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM) CAWANGAN KELANTAN

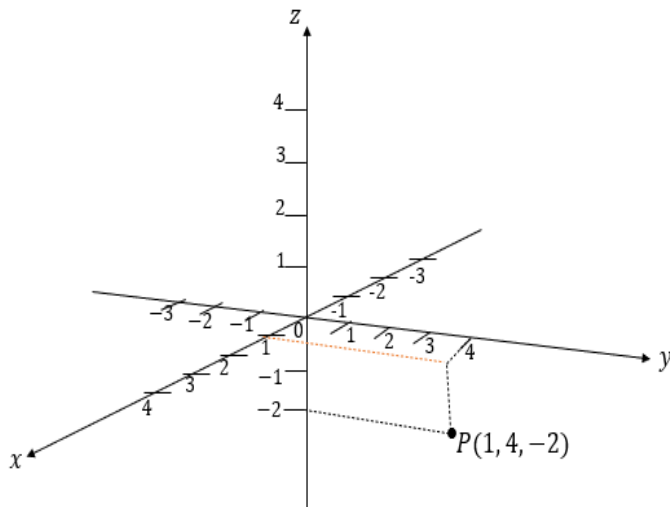
MODUL KOLEKSI ITEM PERCUBAAN SPM 2024

MATEMATIK TAMBAHAN KERTAS 1

UNTUK KEGUNAAN PEMERIKSA SAHAJA

SKEMA PEMARKAHAN

PERATURAN PEMARKAHAN PEPERIKSAAN PERCUBAAN SPM TAHUN 2024
MATEMATIK TAMBAHAN
TINGKATAN 5
KERTAS 1

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 Hapus anu pertama dengan pengantian OR penghapusan $x = 1 @ y = 4 @ z = -2$ $x = 1 \text{ DAN } z = -2 @$ $y = 4 \text{ DAN } z = -2 @$ $x = 1 \text{ DAN } y = 4$ Label paksi- x, paksi-y dan paksi-z betul Titik P(1, 4, -2) ditanda betul 	1 1 1 1 1 1	6
2	(a)	P(1,2) Q(3,5) NMA(No multiple answers)	1 1	

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

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



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

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

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