i-MODUL KECEMERLANGAN SPM SMKA DAN SABK 2024

PEPERIKSAAN PERCUBAAN SPM 2024

MATEMATIK TAMBAHAN

Kertas 1

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

AMARAN

Peraturan pemarkahan ini mengandungi 8 halaman bercetak

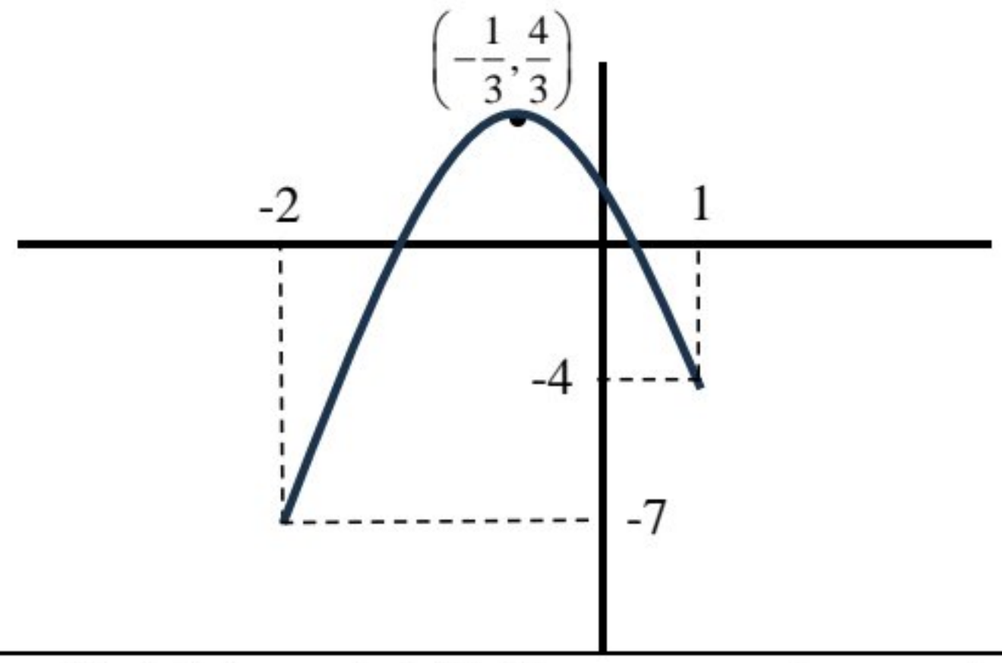
CADANGAN PERATURAN PEMARKAHAN (SKEMA)
Kertas 1

Soalan		Skema Pemarkahan	Markah
1	(a)	$f^{-1}(x)=\frac{4x-3}{2}$	P1
		$g(x)=6\left(\frac{4x-3}{2}\right)+5$	K1
		$g(x)=12x-4$	N1
	(b)	$fg(x)=\frac{24x-5}{4}$	N1
			4
2		$\frac{\frac{6^a}{6^2}+6^a\times 6^3}{6^3}$	K1
		$6^a(6^{-2-3}+6^{3-3})$	K1
		$\frac{6^a(7777)}{7776}$	N1
			3
3		$\frac{1}{2}(\sqrt{5}+\sqrt{2})(x)=15\sqrt{5}+20\sqrt{2}$	P1
		$\frac{30\sqrt{5}+40\sqrt{2}}{\sqrt{5}+\sqrt{2}}\times\frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}-\sqrt{2}}$	K1
		$\frac{30(5)-30\sqrt{10}+40\sqrt{10}-40(2)}{(\sqrt{5})^2-(\sqrt{2})^2}$	K1
		$\frac{70+10\sqrt{10}}{3}$	K1
		$\frac{70}{3}+\frac{10\sqrt{10}}{3}$	N1
			5

<table>
<tr><th colspan="2">Soalan</th><th>Skema Pemarkahan</th><th>Markah</th></tr>
<tr><td>4</td><td>(a)</td><td>$\frac{dy}{dx}=4x+p$
$4(1)+p=2$
$p=-2$</td><td>K1
K1
N1</td></tr>
<tr><td></td><td>(b)</td><td>$\frac{dy}{dx}=4x-2 \quad \text{or} \quad 4x-2=0$
$x=\frac{1}{2}$
$y=2\left(\frac{1}{2}\right)^2-2\left(\frac{1}{2}\right)-4$
$y=-\frac{9}{2}$
<table><tr><td>Nilai x</td><td>0</td><td>$\frac{1}{2}$</td><td>1</td></tr><tr><td>$\frac{dy}{dx}$</td><td>-ve</td><td>0</td><td>+ve</td></tr><tr><td>Lakaran tangen</td><td>\</td><td>—</td><td>/</td></tr></table>Maka, titik $\left(\frac{1}{2},-\frac{9}{2}\right)$ adalah titik minimum.</td><td>K1
K1
K1
K1
N1</td></tr>
<tr><td></td><td></td><td></td><td>7</td></tr>
<tr><td>5</td><td>(a)</td><td>$\begin{pmatrix}7\\12\end{pmatrix}$</td><td>N1</td></tr>
<tr><td></td><td>(b)</td><td>$\begin{pmatrix}-7\\12\end{pmatrix}+\begin{pmatrix}h\\5\end{pmatrix}$</td><td>K1</td></tr>
<tr><td></td><td></td><td>$-7+h=10$</td><td>K1</td></tr>
<tr><td></td><td></td><td>$\sqrt{10^2+17^2}$</td><td>K1</td></tr>
<tr><td></td><td></td><td>$h=17 \;\text{ dan }\; k=\frac{1}{\sqrt{389}}$</td><td>N1</td></tr>
<tr><td></td><td></td><td></td><td>5</td></tr>
</table>

Soalan		Skema Pemarkahan	Markah
6	(a)	$\frac{y}{x^2} = px + q$	P1
	(b)	$p = \frac{8-2}{2-4}$ @ $p = \frac{2-8}{4-2}$	K1
		$p = -3$	N1
		$2 = -3(4) + q$ @ $8 = -3(2) + q$	K1
		$q = 14$	N1
			5
7	(a)	$1 - \left(\frac{8}{27} + \frac{16}{81} + \frac{1}{81}\right)$ $= \frac{40}{81}$	K1 N1
	(b)	${}^4C_1 (p)^1 (q)^3 + {}^4C_3 (p)^3 (q)^1 = \frac{40}{81}$ $4\left(pq^3 + p^3 q\right) = \frac{40}{81}$ $(pq)\left(p^2 + q^2\right) = \frac{10}{81}$	K1 K1 N1
			5
8	(a)	$\frac{4(x+1)^3}{3(1)} + c$ • Pengamiran • Mesti nampak 1	K1
		$\frac{4(x+1)^3}{3} + c$	N1
	(b)	$-1 = \frac{4((0)+1)^3}{3} + c$	K1
		$c = -\frac{7}{3}$	N1
		$y = \frac{4(x+1)^3 - 7}{3}$ atau $y = \frac{4(x+1)^3}{3} - \frac{7}{3}$	N1
			5

Soalan		Skema Pemarkahan	Markah
9	(a)	$T_1 = a$ $T_2 = a + d$ $T_3 = a + d + d$	K1
		$T_1 = a + (1-1)d$ $T_2 = a + (2-1)d$ $T_3 = a + (3-1)d$	K1
		$T_n = a + (n-1)d$	N1
	(b)	$S_5 = a + a + d + a + 2d + a + 3d + a + 4d$	K1
		$S_5 = 5a + 10d$	K1
			5
10		$2x + y + z = 16.00$	N1
		$x + 2y + z = 20.00$	N1
		$x + y + 2z = 18.00$	N1
		Hapuskan salah satu pembolehubah	
		Hapuskan x, y @ z : contoh: $y - z = 2$	K1
		Hapuskan dua pembolehubah , contoh : $4y = 26$	K1
		$x = 2.50$, donut = 2.50	N1
		$y = 6.50$, sekotak susu = 6.50	N1
		$z = 4.50$, kentang goreng = 4.50	N1
			8
11	(a) (i)	$-1 < \log_2 y < 1$ $\frac{1}{2} < y < 2$	K1 N1
	(a) (ii)	$\frac{\log_2 36}{1 - \log_2 y} = 2$ $\log_2 36y^2 = 2$ **dan** $36y^2 = 4$ **dilihat** $y = \frac{1}{3}$	K1 K1 N1
	(b)(i)	$m = 0, 1, -1$	N1
		$\frac{8}{5}$	N1
			7

Soalan		Skema Pemarkahan	Markah
12	(a)	$f(x)=-3\left[x^2+\frac{2}{3}x+\left(\frac{\frac{2}{3}}{2}\right)^2-\left(\frac{\frac{2}{3}}{2}\right)^2-\frac{1}{3}\right]$	K1
		$f(x)=-3\left(x+\frac{1}{3}\right)^2+\frac{4}{3}$	N1
		Nilai maksimum/*Maximum value* $=\frac{4}{3}$	N1
	(b)		
		Bentuk graf betul dan paksi dilukis menggunakan pembaris.	P1
		Titik (-2, -7), (1, -4) dan titik maksimum $\left(-\frac{1}{3},\frac{4}{3}\right)$ dilabel dengan betul dalam domain yang diberi.	P1
			5

Soalan		Skema Pemarkahan	Markah
13	(a)(i)	$\dfrac{1}{\sin 2\theta} = 2$	P1
		$\theta = 15°, 75°, 195°, 255°$	N1
	(ii)	$5(1+\tan^2\theta)+14\tan\theta-8=0$	K1
		$(5\tan\theta-1)(\tan\theta+3)=0$	K1
		$\theta = 11.31°, 108.43°, 191.31°, 288.43°$	N1
	(b)	$\dfrac{\tan\theta+\tan 225°}{1-\tan\theta\tan 225°}$	P1
		$\dfrac{\dfrac{p}{\sqrt{1-p^2}}+1}{1-\dfrac{p}{\sqrt{1-p^2}}}$	K1
		$\dfrac{p+\sqrt{1-p^2}}{\sqrt{1-p^2}-p}$	N1
			8
14	(a)	$10x(15+x)+(x+5)(x+5)=1100$	K1
		$(11x-215)(x-5)=0$	K1
		$x=-\dfrac{215}{11}\ dan\ x=5$	N1
		$x=5$	N1
	(b)	$(15+5)(10(5))=1000$	P1
		$(x+10)^2=1000$	K1
		$x=\dfrac{-20\pm\sqrt{(20)^2-4(1)(-900)}}{2(1)}$	K1
		$x=22$	N1
			8

Soalan		Skema Pemarkahan	Markah
15	(a)(i)	$2!4!$ atau $2!3!\times 4$ atau ${}^{2}P_{2}\times {}^{3}P_{3}\times 4$	K1
		48	N1
	(ii)	$\frac{(9-1)!}{2!3!4!}\times\frac{1}{2}$	K1
		70	N1
	(b)(i)	${}^{31}C_{3}=4495$	N1
	(ii)	$\frac{n!}{2!(n-2)!}=253$	K1
		$\frac{n(n-1)(n-2)!}{(n-2)!}=506$	K1
		$n=23$	N1
			8