



i-MODUL KECEMERLANGAN SPM SMKA DAN SABK 2023

SIJIL PELAJARAN MALAYSIA 2023 (SET 2)

MATEMATIK TAMBAHAN

Kertas 1

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

AMARAN

Peraturan pemarkahan ini **SULIT** dan **Hak Cipta Majlis Pengetua SMKA** dan **Majlis Pengetua SABK**. Kegunaan khusus untuk guru-guru tingkatan 5 di SMKA dan SABK sahaja. Peraturan ini tidak boleh dikeluarkan dalam apa jua bentuk media cetak.

CADANGAN PERATURAN PEMARKAHAN (SKEMA)
Kertas 1

Soalan	Butiran	Markah
1	$(3x - 2)(x + 3) > 0$ kaedah graf, jadual atau garis nombor $x < -3 \quad x > \frac{2}{3}$	1 1 1
		3 m
2	$\frac{dy}{dt} = 1 - 8t$ atau $\frac{dx}{dt} = 5$ $(1 - 8t) \times \frac{1}{5}$ $\left(1 - 8\left(\frac{x - 4}{5}\right)\right) \times \frac{1}{5}$ $\frac{37 - 8x}{25}$	1 1 1 1
		4 m
3 (a)	$k = 1 - \left(\frac{16}{81} + \frac{16}{81} + \frac{7}{27} + \frac{1}{81}\right) = \frac{1}{3}$ ${}^4C_4 p^4 q^0 = \frac{1}{81}$ $p = \frac{1}{3}$	1 1 1
3 (b)	$\frac{1 - 0.7154}{2}$ $\frac{k - 12.45}{5} = 1.07$ $k = 17.80$	1 1 1
		6 m
4	$xy = 4x^3 - b$ $a = 2$ $b = -4$	1 1 1
		3 m

Soalan	Butiran	Markah
5 (a)	$T_2 = a + d = 12$ atau $T_{10} = a + 9d = 52$	1
	$d = 5$	1
	$a = 7$	1
5 (b)	$\frac{2m + 2}{m + 2} = \frac{5m + 4}{2m + 4}$	1
	$(m + 2)(m - 4) = 0$	1
	$m = -2, m = 4$	1
		6 m
6 (a)	$\frac{4}{2}x^2 - 10x + c$	1
	$4 = 2(8)^2 - 10(8) + c$	1
	$y = 2x^2 - 10x - 44$	1
6 (b)	$2\left(\frac{5}{1-x^2}\right) + 3x + c$	1
6(c)	$[2y]_3^k$	1
	$[2k - 2(3)] - \frac{3}{2} = 4$	1
	$k = \frac{23}{4}$	1
		7 m
7 (a)	$3^{3x} - 3^{3x} \cdot 3^{-1} = 54$	1
	$3^{3x} \left(1 - \frac{1}{3}\right) = 54$	1
	$x = \frac{4}{3}$	1
7 (b)	$\frac{1}{2}(10 - 4\sqrt{3} + 5\sqrt{3} - 6)$	1
	$q = 2$	1
		5 m

Soalan	Butiran	Markah
8(a)	$a = 6$	1
8 (b)	$s(12) = \frac{2}{3}$	1
8(c)	$6\left(\frac{4}{k-6}\right) = -12$	1
	$k = 4$	1
		4 m
9 (a)	$2(1 - \sin^2 2x) + 3 \sin 2x - 3 = 0$	1
	$\sin 2x = 1$ atau $\sin 2x = \frac{1}{2}$	1
	sudut rujukan, $\alpha = 90$ atau $\alpha = 30$	1
	$x = 15^\circ, 45^\circ, 75^\circ, 195^\circ, 225^\circ, 255^\circ$	1
9 (b)	$\cos 2x = -\frac{12}{13}$	1
	$-\frac{12}{13} = 2\cos^2 x - 1$	1
	$\cos^2 x = \frac{1}{26}$	1
		7 m
10 (a)(i)	$\frac{1}{2}(25k^2)\left(\frac{1}{3}\right)$ atau $\frac{1}{2}(9k^2)\left(\frac{1}{3}\right)$	1
	$\frac{1}{2}(25k^2)\left(\frac{1}{3}\right) - \frac{1}{2}(9k^2)\left(\frac{1}{3}\right) = 24$	1
	$k = 3$	1
10 (b)	$9\left(\frac{1}{3}\right) + 15\left(\frac{1}{3}\right) + 12$	1
	20	1
		5 m

Soalan	Butiran	Markah
11(a)	$2P_2 \times 2 \times 3P_1 \times 4P_1$ atau $2 \times 2 \times 3 \times 4$ 48	1 1
11(b)	$\frac{5 \times 5!}{3!}$ 100 $100 - \frac{4!}{3!}$ 96	1 1 1 1
		6 m
12(a)	$\overrightarrow{ON} = \overrightarrow{OM} + \overrightarrow{MN}$ $2\underline{i} + 4\underline{j}$	1 1
12(b)	$(-4\underline{i} - \underline{j}) + (2\underline{i} + 4\underline{j})$ atau $(-2\underline{i} - 4\underline{j}) + (-8\underline{i} + 19\underline{j})$ $\overrightarrow{LN} = -2\underline{i} + 3\underline{j}$ $\overrightarrow{NP} = -10\underline{i} + 15\underline{j}$ $-2\underline{i} + 3\underline{j} = \lambda(-10\underline{i} + 15\underline{j})$ $-2 = -10\lambda$ $\overrightarrow{LN} = \frac{1}{5}\overrightarrow{NP}$, L, N, P segaris	1 1 1 1 1 1
		8 m
13 (a)	$\frac{3(3)+2x}{2+3} = 5$ atau $\frac{4(3)+2y}{2+3} = 0$ $x = 8$ atau $y = -6$ $Q(8, -6)$ $\frac{1}{2} [[-4(4) + 3(-6) + 8(-3)] - [-3(3) + 4(8) + (-6)(-4)]]$ 52.5	1 1 1 1 1
13 (b)	$\sqrt{(x - (-4))^2 + (y - (-3))^2}$ atau $\sqrt{(x - 8)^2 + (y - (-6))^2}$ $\sqrt{(x - (-4))^2 + (y - (-3))^2} = 2\sqrt{(x - 8)^2 + (y - (-6))^2}$ $x^2 + y^2 - 24x + 14y + 125 = 0$	1 1 1
		8 m

Soalan	Butiran	Markah
14 (a)	$t = \frac{192}{x^2}$ $A = \pi x(2x) + 2\pi x \left(\frac{192}{x^2} \right) + \pi x^2$ $A = 3\pi x^2 + \frac{384\pi}{x}$	1 1
14 (b)	$\frac{dA}{dx} = 6\pi x - \frac{384\pi}{x^2}$ $6\pi x - \frac{384\pi}{x^2} = 0$ $x = 4$	1 1 1
14 (c)	$\frac{dA}{dx} = 6\pi(8) - \frac{384\pi}{8^2}$ $\frac{1}{42\pi} \times 84\pi$ 2 cms^{-1}	1 1 1
		8 m
15 (a)	$(\sqrt{x} - 4)(\sqrt{x} - 3) = 0 \text{ atau } x^2 - 25x + 144 = 0$ $x = 16 \quad x = 9$	1 1
	$\log_4 x + \frac{\log_4 3x}{\log_4 16} = -1$ $\log_4 x^2(3x) = -2$ $x = 0.2752$	1 1 1
15 (b)	$\log(1+0.08)^n > \log \frac{40}{3}$ $n > 33.66$ $n = 34$	1 1 1
		8 m