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MODUL PINTAS
TINGKATAN 5

3472/1

MATEMATIK TAMBAHAN
Kertas 1

2 jam

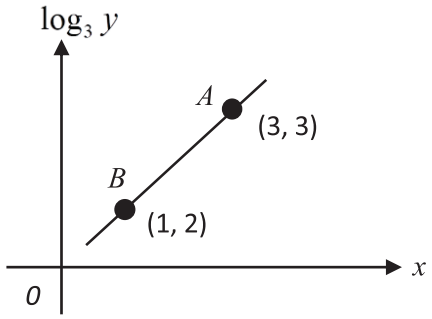
Dua jam

PERATURAN PEMARKAHAN MATEMATIK TAMBAHAN K1 3472/1

NO.	PENYELESAIAN	MARKAH		
1	(a) (i) $3q - p = 0$ $p = 3q$ Let $g^{-1}(x) = y$ $g(y) = x$ $\frac{2y-5}{3y-p} = x$ $2y - 5 = 3xy - px$ $y = \frac{5-px}{2-3x}$ $g^{-1}(x) = \frac{px-5}{3x-2}, x \neq \frac{2}{3}$	N1 N1 N1	5	**6**
	(ii) $n = 0$ $k = \frac{2}{3}$	N1 N1		
	(b) $g(x) = g^{-1}(x)$ jika $p = 2$	N1	1	
2	$5 < 2x^2 + x + 4$ $2x^2 + x - 1 > 0$ $(2x-1)(x+1) > 0$ $x < -1,\ x > \frac{1}{2}$ $2x^2 + x - 6 \leq 0$ $(2x-3)(x+2) \leq 0$ $-2 \leq x \leq \frac{3}{2}$ $x < -1, x > \frac{1}{2}$ ATAU $-2 \leq x \leq \frac{3}{2}$ $-2 \leq x < -1$ *or* $\frac{1}{2} < x \leq \frac{3}{2}$	K1 K1 N1 N1	4	**4**

3	(a) $\left(\sqrt{2}-1\right)\left(p+q\sqrt{2}\right)=5-\sqrt{8}$ $p+q\sqrt{2}=\frac{5-\sqrt{8}}{\sqrt{2}-1}\times\frac{\sqrt{2}+1}{\sqrt{2}+1}$ $p+q\sqrt{2}=\frac{5\sqrt{2}+5-\sqrt{16}-\sqrt{8}}{1}$ $p+q\sqrt{2}=5\sqrt{2}+5-4-2\sqrt{2}$ $p+q\sqrt{2}=1+3\sqrt{2}$ $p=1\ ,\ q=3$	K1 K1 N1	3	**6**
	(b) $\frac{3}{\log_p pq}+\frac{3}{\log_q pq}+2=5p$ $\frac{3}{\frac{\log_{pq} pq}{\log_{pq} p}}+\frac{3}{\frac{\log_{pq} pq}{\log_{pq} q}}=5p-2$ $3\log_{pq} p+3\log_{pq} q=5p-2$ $\log_{pq}(pq)^3=5p-2$ $3=5p-2$ $p=1$	K1 K1 NI	3	
4	(a) Bukan, kerana terdapat persamaan yang mempunyai kuasa pemboleh ubah ialah 2	N1	1	**5**
	(b) $y-7z=-2$ …….. (1) $x-y+5z=2$ …….. (2) $-2x+2y-10z=6$ …… (3) Dari (1), $y=-2+7z$ …….. (4) Gantikan (4) ke dalam (2) $x-(-2+7z)+5z=2$ $x+2-7z+5z=2$ $x-2z=0$ …… (5) Gantikan (4) ke dalam (3) $-2x+2(-2+7z)-10z=6$ $-2x-4+14z-10z=6$ $-2x+4z=10$ $-x+2z=5$ …… (6) (5) + (6) $0=5$ Maka, sistem persamaan linear ini tiada penyelesaian kerana $0\neq 5$	K1 K1 N1 N1	4	

5	(a) $S_n = a + ar + ar^2 + ar^3 + ... + ar^{n-2} + ar^{n-1} \ldots\ldots\ldots (1)$ $(1) \times r : \ rS_n = ar + ar^2 + ar^3 + ar^4 + ... + ar^{n-1} + ar^n \ldots\ldots\ldots (2)$ $(1) - (2) \ , \ S_n - rS_n = a - ar^n$ $S_n(1-r) = a(1-r^n)$ $S_n = \frac{a(1-r^n)}{1-r}, \lvert r \rvert < 1$	K1 K1 N1	3	7
	(b) $S_{2n} = \frac{127}{128} S_n$ $\frac{a\left(1-\left(-\frac{1}{2}\right)^{2n}\right)}{1-\left(-\frac{1}{2}\right)} = \frac{127}{128}\left(\frac{a\left(1-\left(-\frac{1}{2}\right)^{n}\right)}{1-\left(-\frac{1}{2}\right)}\right)$ $1-\left(-\frac{1}{2}\right)^{2n} = \frac{127}{128} - \frac{127}{128}\left(-\frac{1}{2}\right)^{n}$ $Let \left(-\frac{1}{2}\right)^{n} = y$ $1 - y^2 = \frac{127}{128} - \frac{127}{128} y$ $0 = 128y^2 - 127y - 1$ $0 = (y-1)(128y+1)$ $y = 1 \ or \ y = -\frac{1}{128}$ $\left(-\frac{1}{2}\right)^{n} = 1 \quad or \quad \left(-\frac{1}{2}\right)^{n} = -\frac{1}{128}$ $\left(-\frac{1}{2}\right)^{n} = \left(-\frac{1}{2}\right)^{0} \quad or \quad \left(-\frac{1}{2}\right)^{n} = \left(-\frac{1}{2}\right)^{7}$ $n = 0 \ (tidak \ \ diterima) \ , \ n = 7$ $n = 7$	K1 K1 K1 N1	4	

6	(a) $x = 3, \quad \log_3 y = \log_3 3^3 = 3 \quad A(3, 3)$ $x = 1, \quad \log_3 y = \log_3 3^2 = 2 \quad B(1, 2)$ Kedua-dua betul  	K1 N1	2	**5**
	(b) $27 = pq^3$ ..... (1) $9 = pq^1$ ..... (2) Kedua-dua betul Dari (2), $q = \frac{9}{p}$ ..... (3) Gantikan (3) ke dalam (1) $27 = p\left(\frac{9}{p}\right)^3$ $27 = p\left(\frac{729}{p^3}\right)$ $27 = p^2$ $p = \sqrt{27} = 3\sqrt{3}$ Gantikan $p = \sqrt{27}$ ke dalam (2) $\frac{9}{\sqrt{27}} = q$ $\frac{3}{\sqrt{3}} = q$ $q = \sqrt{3}$	K1 N1 N1	3	

7	(a) $\frac{4-3}{7-4} = \frac{0-(-1)}{k-2}$ $k-2=3$ $k=5$	K1 N1	2	**6**
	(b) $-1 = \frac{1}{3}(2) + c$ atau $4 = -3(7) + c$ $c = -\frac{5}{3}$ $c = 25$ $y = \frac{1}{3}x - \frac{5}{3}$ $y = -3x + 25$ $\frac{1}{3}x + 3x = 25 + \frac{5}{3}$ $\frac{10}{3}x = \frac{80}{3}$ $x = 8$ atau $y = 1$ C (8, 1)	K1 K1 N1 N1	4	
8	(a) $3\underline{i} + 4\underline{j} + \frac{1}{2}(6\underline{i} + \underline{j})$ $6\underline{i} + \frac{9}{2}\underline{j}$	K1 N1	2	**4**
	(b) $\overrightarrow{AQ} = \overrightarrow{AO} + \overrightarrow{OQ}$ $-3\underline{i} - 4\underline{j} + \frac{2}{5}\left(6\underline{i} + \frac{9}{2}\underline{j}\right)$ $\frac{3}{5}\underline{i} - \frac{13}{10}\underline{j}$	 K1 N1	2	
9	(a) $6^2 = 10^2 + 6^2 - 2(10)(6)kos\frac{A}{2}$ $\angle kos\frac{A}{2} = 0.833$ $BAC = 67.18^0$ 1.172 rad	K1 N1	2	**5**
	(b) $\left(\frac{1}{2}(10^2)\right)(1.1716) - 2\left(\frac{1}{2}(6)(10)(sin33.56)\right)$ 25.41 $\left(\frac{1}{2}(6^2)(2.346)\right)$ - 25.41 16.817 Mana-mana satu betul K1	K1 K1 N1	3	

10	(a) $\frac{dy}{dx} = 6x + 3px^2$ $-3 = 6(-1) + 3p(-1)^2$ $p = 1$	K1 N1	2	**5**
	(b) $\delta r = 0.005$ $\frac{dv}{dr} = 16\pi r + 2\pi r^2$ $\frac{\delta v}{0.005} = 16\pi(3) + 2\pi(3^2)$ $\delta v = 0.33\,\pi$	 K1 K1 N1	3	
11	(a) $2x^2 + x - 3 = 0$ $x = 1$ dan $x = \frac{-3}{2}$ $P(1,3)$ $\int_1^3 \sqrt{\frac{y-1}{2}}\,dy + \int_3^4 4 - y\,dy$ $\left[\frac{1}{\sqrt{2}}\frac{(y-1)^{\frac{3}{2}}}{\frac{3}{2}}\right]_1^3 + \left[4y - \frac{y^2}{2}\right]_3^4$ $\frac{4}{3} + \frac{1}{2}$ $\frac{11}{6}$	 N1 K1 N1	3	**6**
	(b) $\pi \int_0^1 4x^4 + 4x^2 + 1\,dx$ $\left[\frac{4x^5}{5} + \frac{4x^3}{3} + x\right]_0^1 \pi$ $\left[\frac{4(1)^5}{5} + \frac{4(1)^3}{3} + (1)\right]\pi$ $\frac{47}{15}\pi$	 K1 K1 N1	3	
12	(a) SAKU = 4! = 24 SAKA = $\frac{4!}{2!}$ = 12 Tidak sama kerana perkataan SAKA mempunyai objek secaman	K1 K1 N1	3	**5**
	(b) ${}^9C_5 \times {}^4C_2 \times {}^6C_6 + {}^9C_4 \times {}^4C_2 \times {}^7C_7$ 756 + 756 1512	K1 N1	2	

13	(a) (i) $p=\frac{1}{3}\qquad q=\frac{2}{3}$ $P(x=1)=18P(x=0)$ ${}^{n}C_{1}\left(\frac{1}{3}\right)^{1}\left(\frac{2}{3}\right)^{n-1}=18\left[{}^{n}C_{0}\left(\frac{1}{3}\right)^{0}\left(\frac{2}{3}\right)^{n-0}\right]$ $n\left(\frac{1}{3}\right)\left(\frac{2}{3}\right)^{n-1}=18\left(\frac{2}{3}\right)^{n}$ $\frac{1}{3}n=18\left(\frac{2}{3}\right)$ $n=36$ (ii) $\mu=36\left(\frac{1}{3}\right)=12$	K1 K1 N1 N1	4	**8**
	(b) (i) $P(\lvert Z\rvert>2.053)$ $=P(Z<-2.053)+P(Z>2.053)$ $=2P(Z>2.053)$ $=2(0.0201)$ $=0.0402$ (ii) $P(\lvert Z\rvert\le 1.351)$ $=P(-1.351\le Z\le 1.351)$ $=1-P(Z<-1.351)-P(Z>1.351)$ $=1-2P(Z>1.351)$ $=1-2(0.0883)$ $=1-0.1766$ $=0.8234$	K1 N1 K1 N1	4	
14	(a) $3(2\sin x \cos x)=4\cos x$ $6\sin x\cos x-4\cos x=0$ $2\cos x(3\sin x-2)=0$ $\sin x=\frac{2}{3}\qquad \cos x=0$ $x=41.81^{o}, 90^{o}$ $x=41.81^{o}, 90^{o}, 138.19^{o}, 270^{o}$	K1 K1 N1 N1	4	

	(b) $2 \text{ kos } (x - y) = \sqrt{3}$ $\text{kos } (x - y) = \frac{\sqrt{3}}{2}$ $x - y = 30$ $2 \text{ kos } (x + y) = 1$ $\text{kos } (x + y) = \frac{1}{2}$ $x + y = 60$ $30 + 2y = 60$ $y = 15$ $x = 45$	 K1 K1 N1 N1	4	**8**
15	(a) $21 = \frac{1}{2}(14)(5)\sin A$ $\sin A = \frac{3}{5}$ $\angle A = 36.87^\circ$ $\angle BAC = 143.13^\circ$	K1 K1 N1	3	**8**
	(b) $BC^2 = 14^2 + 5^2 - 2(14)(5)\text{ kos } 143.13^\circ$ $BC = 18.248$	K1 N1	2	
	(c) $\frac{14}{\sin BCA} = \frac{18.248}{sin\ 143.13^\circ}$ $\angle BCA = 27.40^\circ$ $\frac{5}{\sin 90} = \frac{AT}{sin\ 27.41}$ $AT = 2.301$	K1 K1 N1	3	