MODUL PINTAS
TINGKATAN 5

3472/1

MATEMATIK TAMBAHAN
Kertas 1

2 jam

Dua jam

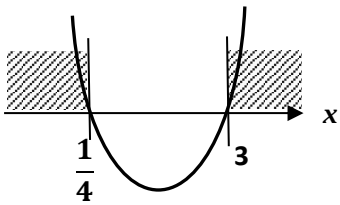
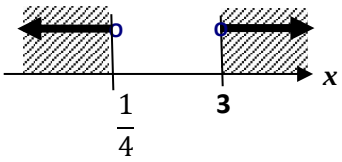
PERATURAN PEMARKAHAN MATEMATIK TAMBAHAN K1 3472/1

NO	PENYELESAIAN	MARKAH		
1.	(a) $\frac{p^2}{3} \times 3^p \times 2^{-(p+2)} \times y^{-2p} \times y^{p+2} = q^1 y^{-2}$ $y^{-2p+p+2} = y^{-2}$ $-p + 2 = -2$ $p = 4$ $\frac{p^2}{3} \times 3^p \times \left(\frac{1}{2}\right)^{p+2} = q^1$ $q = \frac{27}{4}$ Bandingkan kuasa bagi *y* atau nilai pemalar dapat K1	K1 N1 K1 N1	4	**7**
	(b) $log_x 3 = p$: $x^p = 3$ $log_y 2 = q$: $y^q = 2$ $log_z 5 = r$: $z^r = 5$ Mana-mana satu betul $(x^p)(y^{2q}) - z^r = (3)(y^q)^2 - 5$ $= (3)(2)^2 - 5$ $= 7$	K1 K1 N1	3	
2.	$p = \frac{3}{4} - \frac{k}{2}$ …….. (1) $2k^2 - 10k = -5p + 7$…….. (2) Gantikan (1) ke dalam (2) $2k^2 - 10k = -5\left(\frac{3}{4} - \frac{k}{2}\right) + 7$ $2k^2 - 10k = -\frac{15}{4} + \frac{5k}{2} + 7$ $8k^2 - 40k = -15 + 10k + 28$ $8k^2 - 50k - 13 = 0$ $(2k - 13)(4k + 1) = 0$ $k = \frac{13}{2}, k = -\frac{1}{4}$ $p = -\frac{5}{2}, p = \frac{7}{8}$	K1 K1 N1 N1	4	**4**

NO	PENYELESAIAN	MARKAH		
3.	(a) $a = 5000$ $r = 1.035$ $n = 10$ $T_{10} = 5000 \times 1.035^{10-1}$ $T_{10} = \text{RM}6814.49$	K1 N1	2	**5**
	(b) $T_n > 7000$ $5000 \times 1.035^{n-1} > 7000$ $1.035^{n-1} > \frac{7000}{5000}$ $(n-1)\log_{10} 1.035 > \log_{10} 1.4$ $n - 1 > \frac{log_{10} 1.4}{log_{10} 1.035}$ $n - 1 > 9.7808$ $n > 10.7808$ $n = 11$	K1 KI N1	3	
4.	(a) $\sin(x+45^\circ)\sin(x-45^\circ)$ $= (\sin x \text{kos}45^\circ - \text{kos}x \sin 45^\circ)(\sin x \text{kos}45^\circ + \text{kos}x \sin 45^\circ)$ $= \left(\frac{1}{\sqrt{2}}\sin x - \frac{1}{\sqrt{2}}\text{kos}x\right)\left(\frac{1}{\sqrt{2}}\sin x + \frac{1}{\sqrt{2}}\text{kos}x\right)$ $= \left(\frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}\right)(\sin x - \text{kos}x)(\sin x + \text{kos}x)$ $= \frac{1}{2}\sin^2 x - \frac{1}{2}\text{kos}^2 x$ $= \frac{1}{2}(-\text{kos}2x)$ $= -\frac{1}{2}\text{kos}2x$	K1 K1 K1	3	**7**

NO	PENYELESAIAN	MARKAH		
	(b) $\tan 2x = -\frac{5}{12}$ $\frac{2\tan x}{1-\tan^2 x} = -\frac{5}{12}$ $24\tan x = -5 + 5\tan^2 x$ $0 = 5\tan^2 x - 24\tan x - 5$ $0 = (5\tan x + 1)(\tan x - 5)$ $\tan x = -\frac{1}{5}$, 5 (tidak diterima/ not accepted)	P1 K1 K1 N1	4	
5.	(a) $y = 0$, $x^2 + 3x - 8 = 0$ $x = \frac{-3 \pm \sqrt{3^2-4(1)(-8)}}{2(1)}$ atau $b^2 - 4ac = (3)^2 - 4(1)(-8)$ $x = 1.70$ atau $x = -4.70$ $= 41 > 0$ Lokus *R* bersilang dengan paksi-*x* pada titik $(-4.70, 0)$ dan $(1.70, 0)$. *Locus R intersects the x – axis at* $(-4.70, 0)$ *and* $(1.70, 0)$. atau Lokus *R* bersilang dengan paksi-*x* pada dua titik berbeza. *Locus R intersects the x – axis at two different points.*	K1 N1 N1	3	**7**
	(b) $y = x - 2$ ——— (1) $x^2 + y^2 + 3x - 3y - 8 = 0$ ——— (2) Substitute (1) into (2), $x^2 + (x-2)^2 + 3x - 3(x-2) - 8 = 0$ $x^2 + x^2 - 4x + 4 + 3x - 3x + 6 - 8 = 0$ $2x^2 - 4x + 2 = 0$ $x^2 - 2x + 1 = 0$ atau $(x-1)(x-1) = 0$ $b^2 - 4ac$ $= (-2)^2 - 4(1)(1)$ $x = 1$ $= 0$ $y = x - 2$ ialah tangen kepada lokus *R*. *y = x – 2 is a tangent to the locus R.*	K1 K1 K1 N1	4	

NO	PENYELESAIAN	MARKAH		
6.	a) i) $p = 3$	N1		
	ii) $y = \frac{3}{x-3}$			
	$y\,(x-3) = 3$		3	
	$xy = 3 + 3y$			
	$x = \frac{3+3y}{y}$	K1		
	$f(x) = \frac{3(1+x)}{x}\,, x \neq 0$ atau/ or $f(x) = \frac{3}{x} + 3\,, x \neq 0$	N1		**6**
	b) $\frac{x}{4} - \frac{a}{4} = 2bx + \frac{5}{8}$	K1		
	$\frac{1}{4} = 2b$ atau $-\frac{a}{4} = \frac{5}{8}$	K1	3	
	$b = \frac{1}{8}$ dan / and $a = -\frac{5}{2}$	N1		
7.	a)$\log_5 y = \log_5 625 - \log_5 x$			
	$\log_5 y = 4 - \log_5 x$	N1	1	
	b) $h = 4$	N1		**4**
	$-1 = \frac{4-1}{0-k}$ atau $1 = -k + 4$	K1	3	
	$k = 3$	N1		
8.	$\overrightarrow{AQ} = \lambda\overrightarrow{AC}$			
	$\overrightarrow{AB} = \frac{1}{3}\left(-9\underline{y}\right)$ $\overrightarrow{BQ} = \frac{1}{4}\left(\overrightarrow{BD}\right)$			
	$\overrightarrow{BQ} = \frac{1}{4}\left(\overrightarrow{BA} + \overrightarrow{AD}\right)$			
	$\overrightarrow{BQ} = \frac{1}{4}\left(3\underline{y} + 4\underline{x}\right)$	K1	4	
	$\overrightarrow{AQ} = \overrightarrow{AB} + \overrightarrow{BQ}$ atau $\overrightarrow{AC} = \overrightarrow{AD} + \overrightarrow{DC}$			**4**
	$\overrightarrow{AQ} = -\frac{9}{4}\underline{y} + \underline{x}$ $\overrightarrow{AQ} = 4\underline{x} - 9\underline{y}$	K1		
	$-\frac{9}{4}\underline{y} + \underline{x} = \lambda\left(4\underline{x} - 9\underline{y}\right)$			
	$\frac{-9}{4} = \lambda(-9)$ $1 = \lambda(4)$			
	$\lambda = \frac{1}{4}$ $\lambda = \frac{1}{4}$	K1		
	A, Q dan C adalah segaris / A, Q and C are colinear	N1		

NO	PENYELESAIAN	MARKAH		
9.	a) $\frac{1}{2}(17)^2\theta = 140$ $\theta = 0.9689\, rad$	K1 N1	2	**5**
	b) $2\pi - 0.9689$ $S = 17(2\pi - 0.9689) + 2(17)$ 124.36	P1 K1 N1	3	
10.	a)  atau  $x < \frac{1}{4}$, $x > 3$	K1 N1	2	**4**
	b) $(-2q)^2 - 4(2p)(6) = 0$ $q = \pm 2\sqrt{3p}$	K1 N1	2	
11.	a) $y = \int -2x\, dx$ $y = -x^2 + c$ $5 = -(2)^2 + c$ $c = 9$ $y = -x^2 + 9$	K1 K1 N1	3	**6**
	b) $\int_0^2 (-x^2 + 9)dx - (2 \times 5)$ $\left[\frac{-x^3}{3} + 9x\right]_0^2 - 10$ $\left[\left[\frac{-2^3}{3} + 9(2)\right] - \left[\frac{-0^3}{3} + 9(0)\right]\right] - 10$ $\frac{16}{3}$	K1 K1 N1	3	
12.	a) ${}^6C_6\,(p^6)(1-p)^0 = 0.0248$ $\log_{10} p^6 = \log_{10} 0.04398$ atau $p = \sqrt[6]{0.0248}$ $p = 0.54$	K1 N1	2	

NO	PENYELESAIAN	MARKAH		
	b) ${}^{6}C_{0}(0.54)^{0}(0.46)^{6}$ $atau$ ${}^{6}C_{1}(0.54)^{1}(0.46)^{5}$ 1- $({}^{6}C_{0}(0.54)^{0}(0.46)^{6} + {}^{6}C_{1}(0.54)^{1}(0.46)^{5})$ 0.9238	K1 K1 N1	3	**5**
13.	(a) (i) ${}^{3}P_{3} \times 3 \times {}^{4}P_{2}$ 216	K1 N1	5	
	(ii) ${}^{4}P_{3} \times {}^{3}P_{2} \times 3$ $atau$ ${}^{4}P_{4} \times {}^{3}P_{1} \times 2$ $atau$ ${}^{4}P_{3} \times {}^{3}P_{1} \times {}^{1}P_{1} \times 2$ ${}^{4}P_{3} \times {}^{3}P_{2} \times 3 + {}^{4}P_{4} \times {}^{3}P_{1} \times 2 + {}^{4}P_{3} \times {}^{3}P_{1} \times {}^{1}P_{1} \times 2$ 720	K1 K1 N1		
	(b) $\frac{(n+1)!}{(n+1-4)!} = 4\frac{n!}{(n-2)!}$ $\frac{(n+1)!}{(n-3)!} = 4\frac{n!}{(n-2)!}$ $\frac{(n+1)!}{n!} = 4\frac{(n-3)!}{(n-2)!}$ $\frac{(n+1)n!}{n!} = 4\frac{(n-3)!}{(n-2)(n-3)!}$ $(n+1)(n-2) = 4$ $n^2 - n - 2 - 4 = 0$ $n^2 - n - 6 = 0$ $(n-3)(n+2) = 0$ $n = 3$, $n = -2$ (tidak diterima / *not accepted*)	K1 K1 N1	3	**8**
14.	a) i) $\frac{dx}{dt} = 4t$ ii) $\frac{dy}{dx} = 4t^3 \times \frac{1}{4t}$ $\frac{dy}{dx} = t^2$ $\frac{dy}{dx} = \frac{x+4}{2}$	N1 K1 N1	3	

NO	PENYELESAIAN	MARKAH		
	b) $2x + 2y = 25$ $y = \frac{25}{2} - x$ atau $2\pi j = x$ $j = \frac{x}{2\pi}$ $I = \pi j^2 t$ $= \pi\left(\frac{x}{2\pi}\right)^2 (y)$ $= \frac{\pi x^2}{4\pi^2}(y)$ $= \frac{1}{4\pi}x^2\left(\frac{25}{2} - x\right)$ $= \frac{25x^2}{8\pi} - \frac{x^3}{4\pi}$ $\frac{dI}{dx} = \frac{25x}{4\pi} - \frac{3x^2}{4\pi}$ $\frac{25x}{4\pi} - \frac{3x^2}{4\pi} = 0$ $\frac{x}{4\pi}(25 - 3x) = 0$ $\frac{x}{4\pi} = 0$ $x = 0$ tidak diterima kerana $x > 0$ $25 - 3x = 0$ $Panjang/\ Length = \frac{25}{3}$, $Lebar/\ Width = \frac{25}{6}$	K1 K1 K1 K1 N1	5	**8**

NO	PENYELESAIAN	MARKAH		
15.	(a) $ax^2 + bx + c = 0$ $x^2 + \frac{b}{a}x = -\frac{c}{a}$ $x^2 + \frac{b}{a}x + \left(\frac{b}{2a}\right)^2 = -\frac{c}{a} + \left(\frac{b}{2a}\right)^2$ $\left(x + \frac{b}{2a}\right)^2 = \frac{-4ac + b^2}{4a^2}$ $x + \frac{b}{2a} = \frac{\pm\sqrt{b^2-4ac}}{2a}$ atau $x = \frac{\pm\sqrt{b^2-4ac}}{2a} - \frac{b}{2a}$ $x = \frac{-b+\sqrt{b^2-4ac}}{2a}$ atau $x = \frac{-b-\sqrt{b^2-4ac}}{2a}$ $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$	K1 K1 K1 N1 N1	5	**8**
	(b) $x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(5)(9)}}{2(5)}$ $x = \frac{6 \pm \sqrt{-144}}{10}$ $x = \frac{6 \pm (\sqrt{144})(\sqrt{-1})}{10}$ $x = \frac{6 \pm 12i}{10}$ $x = \frac{3 \pm 6i}{5}$ $x = \frac{3+6i}{5}$, $x = \frac{3-6i}{5}$	K1 K1 N1	3	

PERATURAN PEMARKAHAN TAMAT