MODUL PINTAS
TINGKATAN 5

3472/1

MATEMATIK TAMBAHAN
Kertas 1

2 jam

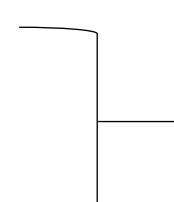**Dua jam**

PERATURAN PEMARKAHAN MATEMATIK TAMBAHAN K1 3472/1

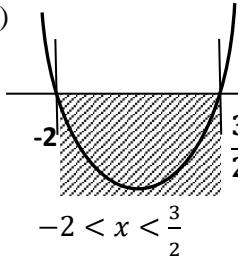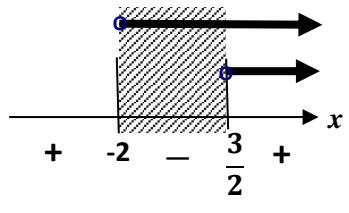| NO	PENYELESAIAN	MARKAH		
1.	(a) $$\frac{p^2}{3} \times 3^p \times 2^{-(p+6)} \times y^{-4p} \times y^{p+6} = q^1 y^{-3}$$	K1		
	$y^{-4p+p+6} = y^{-3}$ $-3p + 6 = -3$ $p = 3$ Bandingkan kuasa bagi y atau nilai pemalar dapat K1	N1	4	
	$$\frac{p^2}{3} \times 3^p \times 2^{-(p+6)} = q^1$$	K1		
	$$q = \frac{81}{512}$$	N1		7
	(b) $$\left(\frac{\log_2 8}{\log_2 \sqrt{y}}\right)\left(\frac{\log_2 y}{\log_2 x}\right)(\log_2 x)$$	K1		
	$$\left(\frac{3\log_2 2}{\frac{1}{2}\log_2 y}\right)\left(\frac{\log_2 y}{\log_2 x}\right)(\log_2 x)$$	K1	3	
	6	N1		
2.	$x = 5 - 2y \dots \dots \dots (1)$	P1		
	$\|x + y\| = 4 \dots \dots \dots (2)$			
	Gantikan (1) ke dalam (2)			
	$\quad\|5 - 2y + y\| = 4$	K1	4	**4**
	$\quad 5 - y = \pm 4$			
	$\quad y = 1, \quad y = 9$	N1		
	$\quad x = 3, \quad x = -13$	N1		

NO	PENYELESAIAN	MARKAH		
3.	$$\frac{a(r^4 - 1)}{r - 1} = 10\left[\frac{a(r^2 - 1)}{r - 1}\right]$$	K1		
	$r^4 - 1 = 10r^2 - 10$ $r^4 - 10r^2 + 9 = 0$ (Tertunjuk/ *Proven*)	N1		
	$r^4 - 10r^2 + 9 = 0$ $(r^2 - 1)(r^2 - 9) = 0$ $r^2 - 1 = 0 \qquad r^2 - 9 = 0$ $r = \pm 1$ (*Abaikan*) atau $r = \pm 3$	K1 N1	5	5
	Nilai Positif $r = 3$ / *The value of* $r = 3$	N1		
4.	(a) $\kos 3\alpha = \kos(2\alpha + \alpha)$ $= \kos 2\alpha \kos \alpha - \sin 2\alpha \sin \alpha$ $= (2\kos^2 \alpha - 1)\kos \alpha - (2\sin \alpha \kos \alpha)\sin \alpha$ $= 2\kos^3 \alpha - \kos \alpha - 2\sin^2 \alpha \kos \alpha$ $= 2\kos^3 \alpha - \kos \alpha - 2(1 - \kos^2 \alpha)\kos \alpha$ $= 2\kos^3 \alpha - \kos \alpha - 2\kos \alpha + 2\kos^3 \alpha$ $= 4\kos^3 \alpha - 3\kos \alpha$	K1 K1 K1 K1	4	7
	(b) $2\kos^2 \alpha - 1 = 5\kos \alpha - 3$ $2\kos^2 \alpha - 5\kos \alpha + 2 = 0$ $(\kos \alpha - 2)(2\kos \alpha - 1) = 0$ $\kos \alpha = 2$ (Tiada Penyelesaian) $\qquad 2\kos \alpha = 1$ $\kos \alpha = \frac{1}{2}$ $\alpha = 60°$	K1 K1 N1	3	

NO	PENYELESAIAN	MARKAH		
5.	**(a)** $y = 0,$ $x^2 - 14x + 40 = 0$ $(x - 4)(x - 10) = 0$ atau $b^2 - 4ac = (-14)^2 - 4(1)(40)$ $x = 4$ atau $x = 10$ $= 36 > 0$ Lokus R bersilang dengan paksi-x pada titik $(4, 0)$ dan $(10, 0)$. *Locus R intersects the x – axis at (4, 0) and (10, 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) $x^2 + y^2 - 14x + 8y + 40 = 0$ ———— (2) Substitute (1) into (2), $x^2 + (x - 2)^2 - 14x + 8(x - 2) + 40 = 0$ $x^2 + x^2 - 4x + 4 - 14x + 8x - 16 + 40 = 0$ $2x^2 - 10x + 28 = 0$ $x^2 - 5x + 14 = 0$ $b^2 - 4ac$ $= (-5)^2 - 4(1)(14)$ $= -31 < 0$ $y = x - 2$ bukan tangen kepada lokus R atau $y = x - 2$ tidak menyentuh lokus R *y = x – 2 is not tangent to the locus R or* *y = x – 2 does not touch locus R*	K1 K1 K1 N1	4	

6.	a) i) $m = \dfrac{1}{2}$
	    ii) $y = \dfrac{5}{2x-1}$
	
	     $y(2x - 1) = 5$
	
	     $2xy = 5 + y$
	
	     $x = \dfrac{5+y}{2y}$
	
	     $f(x) = \dfrac{5+x}{2x}, x \neq 0$
		N1
		
		K1
		
		N1
			3	6

NO	PENYELESAIAN	MARKAH	
	b) $p\left(\frac{2x-3}{3}\right) - q = -3x + 6$ $\frac{2p}{3} = -3$ atau / or $-p - q = 6$ $p = -\frac{9}{2}$ $q = -\frac{3}{2}$	K1 K1 N1	3	
7.	a) $\left(4y = 2x + \frac{q}{x}\right)\frac{x}{4}$ $xy = \frac{x^2}{2} + \frac{q}{4}$	 N1	1	4
	b) $\frac{1}{2} = \frac{2-p}{10-0}$ atau $2 = \frac{1}{2}(10) + \frac{q}{4}$ atau $\frac{q}{4} = p$ $p = -3$ $q = -12$	K1 N1 N1	3	
8.	a) $\overrightarrow{OT} = \overrightarrow{OR} + \overrightarrow{RT}$ $= \frac{1}{2}\overrightarrow{OP} + m\overrightarrow{RQ}$ $= \frac{1}{2}(10\underline{b}) + m(-5\underline{b} + 8\underline{a})$ $= (5 - 5m)\underline{b} + 8m\underline{a}$	 K1 N1	2	4
	b) $\overrightarrow{OT} = \overrightarrow{OS} + \overrightarrow{ST}$ $= \frac{1}{2}\overrightarrow{OQ} + n\overrightarrow{SP}$ $= \frac{1}{4}(8\underline{a}) + n(-2\underline{a} + 10\underline{b})$ $= (2 - 2n)\underline{a} + 10n\underline{b}$	 K1 N1	2	
9.	a) $\frac{1}{2}(18)^2\theta = 150$ $\theta = 0.9259\ rad$	K1 N1	2	5
	b) $s = 18(2\pi - 0.9259)$ $18(2\pi - 0.9259) + 2(18)$ 132.45 cm	K1 K1 N1	3	

NO	PENYELESAIAN	MARKAH		
10.	a) atau $-2 < x < \frac{3}{2}$	K1 N1	2	4
	b) $(-2n)^2 - 4(m)(5) = 0$ $n = \pm\sqrt{5m}$	K1 N1	2	
11.	a) $y = \int 2x\,dx$ $y = x^2 + c$ $3 = 1^2 + c$ $c = 2$ $y = x^2 + 2$	K1 K1 N1	3	6
	b) $\int_2^3 (y-2)^{\frac{1}{2}}\,dy$ $\left[\dfrac{(y-2)^{\frac{3}{2}}}{\frac{3}{2}(1)}\right]_2^3$ $\left[\dfrac{(3-2)^{\frac{3}{2}}}{\frac{3}{2}(1)}\right] - \left[\dfrac{(2-2)^{\frac{3}{2}}}{\frac{3}{2}(1)}\right]$ $\dfrac{2}{3}$	K1 K1 N1	3	
12.	a) $^7C_7\,(p^7)(1-p)^0 = 0.04398$ $\log_{10} p^7 = \log_{10} 0.04398$ atau $p = \sqrt[7]{0.04398}$ $p = 0.64$	K1 N1	2	5
	b) $^7C_0(0.64)^0(0.36)^7$ atau $^7C_1(0.64)^1(0.36)^6$ atau $7C_2(0.64)^2(0.36)^5$ $^7C_0(0.64)^0(0.36)^7 + {}^7C_1(0.64)^1(0.36)^6 + 7C_2(0.64)^2(0.36)^5$ 0.06255	K1 K1 N1	3	
13.	(a) (i) $^3P_3 \times 3 \times {}^4P_2$ 216	K1 N1		

NO	PENYELESAIAN	MARKAH		
	(ii) $^4P_3 \times {}^3P_2 \times 3$ atau $^4P_4 \times {}^3P_1 \times 2$ atau $^4P_3 \times {}^3P_1 \times {}^1P_1 \times 2$	K1	5	
	$^4P_3 \times {}^3P_2 \times 3 + {}^4P_4 \times {}^3P_1 \times 2 + {}^4P_3 \times {}^3P_1 \times {}^1P_1 \times 2$	K1		
	720	N1		
	(b) $\dfrac{n(n-1)(n-2)!}{(n-r)(n-1-r)(n-2-r)!} = \dfrac{(n-2)!}{(n-2-r)!}$	K1		**8**
	$\dfrac{n(n-1)}{(n-r)(n-1-r)} = 1$	K1	3	
	$n^2 - n = n^2 - n - nr - nr + r + r^2$			
	$0 = -2nr + r + r^2$			
	$2nr = r + r^2$			
	$n = \dfrac{r + r^2}{2r}$			
	$n = \dfrac{1+r}{2}$	N1		
14.	a) i) $\dfrac{dx}{dt} = 2t$	N1		
	ii) $\dfrac{dy}{dx} = 14t^3 \times \dfrac{1}{2t}$	K1		
	$\dfrac{dy}{dx} = 7t^2$		3	
	$\dfrac{dy}{dx} = 7(x-3)$	N1		
	b) $2x + 2y = 18$ $y = 9 - x$ atau $2\pi j = x$	K1		
	$j = \dfrac{x}{2\pi}$			
	$I = \pi j^2 t$			
	$= \pi \left(\dfrac{x}{2\pi}\right)^2 (y)$			
	$= \dfrac{\pi x^2}{4\pi^2}(y)$			
	$= \dfrac{1}{4\pi} x^2 (9 - x)$	K1		**8**

NO	PENYELESAIAN	MARKAH		
	$= \dfrac{9x^2}{4\pi} - \dfrac{x^3}{4\pi}$			
	$\dfrac{dI}{dx} = \dfrac{9x}{2\pi} - \dfrac{3x^2}{4\pi}$	K1		
	$\dfrac{9x}{2\pi} - \dfrac{3x^2}{4\pi} = 0$		5	
	$\dfrac{x}{2\pi}\left(9 - \dfrac{3x}{2}\right) = 0$	K1		
	$\dfrac{x}{2\pi} = 0$			
	$x = 0$ tidak diterima kerana $x > 0$			
	$9 - \dfrac{3x}{2} = 0$			
	$Panjang/\,Length = 6$ dan $Lebar/\,Width = 3$	N1		
15.	(a) $ax^2 + bx + c = 0$			
	$x^2 + \dfrac{b}{a}x = -\dfrac{c}{a}$			
	$x^2 + \dfrac{b}{a}x + \left(\dfrac{b}{2a}\right)^2 = -\dfrac{c}{a} + \left(\dfrac{b}{2a}\right)^2$	K1		
	$\left(x + \dfrac{b}{2a}\right)^2 = \dfrac{-4ac + b^2}{4a^2}$	K1	5	
	$x + \dfrac{b}{2a} = \dfrac{\pm\sqrt{b^2-4ac}}{2a}$ atau $x = \dfrac{\pm\sqrt{b^2-4ac}}{2a} - \dfrac{b}{2a}$	K1		
	$x = \dfrac{-b+\sqrt{b^2-4ac}}{2a}$ atau $x = \dfrac{-b-\sqrt{b^2-4ac}}{2a}$	N1		
	$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	N1		
	(b)			**8**
	$x = \dfrac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(5)}}{2(1)}$	K1		
	$x = \dfrac{4 \pm \sqrt{-4}}{2}$			
	$x = \dfrac{4\pm(\sqrt{4})(\sqrt{-1})}{2}$	K1		

NO	PENYELESAIAN	MARKAH		
	$x = \dfrac{4 \pm 2i}{2}$ $x = \frac{4+2i}{2}$, $x = \frac{4-2i}{2}$ $x = 2 + i$, $x = 2 - i$	N1	3	