MODUL PINTAS PPC PAHANG SPM 2023
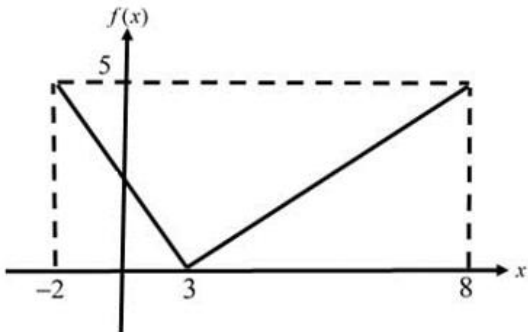## MATEMATIK TAMBAHAN
PERATURAN PEMARKAHAN
KERTAS 1

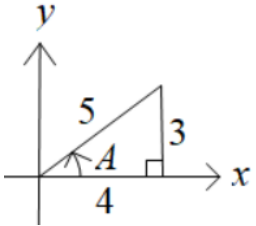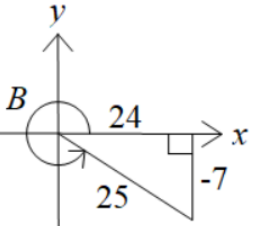| SOALAN			SKEMA	MARKAH	MARKAH PENUH
1			Cari m $\dfrac{13-3}{8-3}$ atau setara	1	
			Cari c $13 = {}^*2(8) + c$ atau $3 = {}^*2(3) + c$ atau $Y - 13 = {}^*2(X - 8)$ atau $Y - 3 = {}^*2(X - 3)$	1	
			$\ln y = 2\ln x - 3$	1	
			$y = \dfrac{x^2}{e^3}$ atau $y = \dfrac{x^2}{20.09}$ atau $y = 0.04979x^2$	1	
					4
2	(a)	(i)	$m^{-1}(x) = x - 5$ **atau** $m(-2) = 3$	1	
			$(t + 2) - 5 = 3$	1	
			6	1	
		(ii)	$nm(x) = (x + 5)^2 - 2$	1	
	(b)	(i)	$\dfrac{p}{y} + 2 = x,\ y$ boleh sebarang huruf selain x, k, g, p	1	
			$g(y) = \dfrac{5\left(\dfrac{p}{y} + 2\right) - 8}{\left(\dfrac{p}{y} + 2\right) - 2}$	1	
			$g(x) = \dfrac{5p + 2x}{p}$ **atau** $g(x) = 5 + \dfrac{2}{p}x$	1	
		(ii)	7	1	
					8

3	(a)		$\alpha + \beta = \dfrac{p}{2}$	1	
			$\alpha\beta = \dfrac{q}{2}$	1	
	(b)		$\dfrac{2}{\alpha} + \dfrac{2}{\beta} = -\dfrac{-12}{3}$ dan $\left(\dfrac{2}{\alpha}\right)\left(\dfrac{2}{\beta}\right) = \dfrac{8}{3}$	1	
			$\dfrac{4}{\dfrac{q}{2}} = \dfrac{8}{3}$	1	
			Gantikan nilai q: $\dfrac{2\left(\dfrac{p}{2}\right)}{\dfrac{*3}{2}} = \dfrac{-(-12)}{3}$	1	
			$q = 3$, $p = 6$	1	
					6
4	(a)		$q - (q+3) = (q+3) - (3q-2)$	1	
			$q = 4$	1	
	(b)		$a = 10$ **dan** $d = -3$	1	
			$S_{14} - S_6$ $\dfrac{14}{2}\left[2(10) + (14-1)(-3)\right] - \dfrac{6}{2}\left[2(10) + (6-1)(-3)\right]$ atau setara	1	
			-148	1	
					5
5	(a)	(i)	$\dfrac{4}{n+1}x^{n+1} + c$	1	
		(ii)	$n \neq -1$	1	
			c = pemalar pengamiran	1	
	(b)		$\dfrac{25x^{-3}}{-3} - \dfrac{x^{-1}}{-1}$	1	
			$-\dfrac{25}{3x^3} + \dfrac{1}{x} + c$	1	
					5

6			$10\theta = \dfrac{25}{9}\pi$	1	
			$\dfrac{5}{18}\pi$	1	
					2
7	(a)		$\dfrac{11!}{4!4!2!}$	1	
			34650	1	
	(b)	(i)	$^{3}C_1 \times {}^{2}C_1$ **atau** $^{2}C_1 \times {}^{2}C_1$ **atau** $^{2}C_1 \times {}^{2}C_1$	1	
			$(^{3}C_1 \times {}^{2}C_1) + (^{2}C_1 \times {}^{2}C_1) + (^{2}C_1 \times {}^{2}C_1)$	1	
			14	1	
		(ii)	$(6-1)!$ atau setara	1	
			120	1	
					7
8	(a)		$(11,13) = \left(\dfrac{1(x)+2(14)}{1+2}, \dfrac{1(y)+2(11)}{1+2} \right)$	1	
			$K = \left(\dfrac{1(2)+2(*5)}{1+2}, \dfrac{1(2)+2(*17)}{1+2} \right)$	1	
			$K(4,12)$	1	
	(b)		$\dfrac{1}{2}\left|(5(13)+11(12)+4(17)) - (17(11)+13(4)+12(5))\right|$ **atau** $\dfrac{1}{2}\left|(2(11)+14(13)+11(12)+4(2)) - (2(14)+11(11)+13(4)+12(2))\right|$	1	
			17 **dan** $\dfrac{119}{2}$ @ 59.5	1	
			$2:7$	1	
					6
9	(a)		$a = 22680$, $r = \dfrac{9}{16}$	1	
			$22680\left(\dfrac{9}{16}\right)^{n-1} < 100$	1	

			$n-1 > \dfrac{\log_{10}\dfrac{100}{22680}}{\log_{10}\dfrac{9}{16}}$	1	
			$n = 11$	1	
	(b)		$\dfrac{22680}{1-\dfrac{9}{16}}$	1	
			51840	1	
					6
10			$V = \pi j^3$	1	
			$\partial V = -0.6\,\text{cm}^3$	1	
			$\dfrac{dV}{dj} = 3\pi j^2$	1	
			Guna rumus $\partial V = \dfrac{dV}{dj} \times \partial j$ dan gantikan nilai $-0.6 = 3\pi(3.1)^2 \times \partial j$	1	
			$\partial j = -0.006624 \,//\, -0.006625 \,//\, -\dfrac{20}{961\pi}$	1	
					5
11	(a)		$^nC_5(0.4)^5(0.6)^{n-5} = 10\left[\,^nC_4(0.4)^4(0.6)^{n-4}\right]$	1	
			$\dfrac{n!}{(n-5)!5!}(0.4)^5\dfrac{(0.6)^n}{(0.6)^5} = 10\left[\dfrac{n!}{(n-4)!4!}(0.4)^4\dfrac{(0.6)^n}{(0.6)^4}\right]$	1	
			$n = 79$	1	
	(b)		Min = 31.6	1	
					4
12	(a)				

4

			Bentuk V	1	
			Label $(3,0),(-2,5),(8,5)$	1	
			Julat: $0 \le f(x) \le 5$	1	
	(b)		$fg(x) = \lvert 2x - 9 \rvert$	1	
			$2x - 9 = x$, $2x - 9 = -x$	1	
			$x = 9$, $x = 3$	1	
					6
13	(a)	(i)	$\overrightarrow{BC} = \overrightarrow{AC} - \overrightarrow{AB}$ @ setara **ATAU** $\overrightarrow{AT} = \overrightarrow{AB} + \overrightarrow{BT}$ @ setara	1	
			$\overrightarrow{BC} = -2\underset{\sim}{i} + 10\underset{\sim}{j}$ atau $\begin{pmatrix} -2 \\ 10 \end{pmatrix}$	1	
		(ii)	$\overrightarrow{AT} = \dfrac{7}{2}\underset{\sim}{i} - \dfrac{7}{2}\underset{\sim}{j}$ atau $\begin{pmatrix} \dfrac{7}{2} \\ -\dfrac{7}{2} \end{pmatrix}$	1	
			$\dfrac{\dfrac{7}{2}\underset{\sim}{i} - \dfrac{7}{2}\underset{\sim}{j}}{\sqrt{\left(\dfrac{7}{2}\right)^2 + \left(-\dfrac{7}{2}\right)^2}}$	1	
			$\dfrac{\sqrt{2}}{2}\underset{\sim}{i} - \dfrac{\sqrt{2}}{2}\underset{\sim}{j}$	1	
		(iii)	$-3\underset{\sim}{i} + k\underset{\sim}{j} = -2h\underset{\sim}{i} + 10h\underset{\sim}{j}$	1	
			$h = \dfrac{3}{2}$	1	
			$k = 15$	1	
					8
14	(a)	(i)	$\log_a x = p$, $x = a^p$ **atau** $\log_a y = q$, $y = a^q$	1	
			$\dfrac{x}{y} = a^{p-q}$	1	
			$\log_a \dfrac{x}{y} = \log_a x - \log_a y$	1	

		(ii)	Guna hukum hasil bahagi: $\log_3\left(\dfrac{54}{6}\div 3\right)$	1	
			1	1	
	(b)		$20\,000e^{-0.03t} < \dfrac{1}{2}(20000)$	1	
			$t > \dfrac{\ln\dfrac{1}{2}}{-0.03}$	1	
			24	1	
					8
15	(a)	(i)	495°	1	
		(ii)	$\dfrac{2}{-\sin\theta}$	1	
			$-\dfrac{2}{h}$	1	
	(b)	(i)	$\sin A = \dfrac{3}{5}$ @ kos $A = \dfrac{4}{5}$ @ ATAU $\sin B = -\dfrac{7}{25}$ @ kos $B = \dfrac{24}{25}$ @	1	
			$\left(\dfrac{3}{5}\right)\left(\dfrac{24}{25}\right)+\left(\dfrac{4}{5}\right)\left(-\dfrac{7}{25}\right)$	1	
			$\dfrac{44}{125}$	1	
		(ii)	$\dfrac{\dfrac{3}{4}-\left(-\dfrac{7}{24}\right)}{1+\left(\dfrac{3}{4}\right)\left(-\dfrac{7}{24}\right)}$	1	
			$\dfrac{4}{3}$	1	
					8