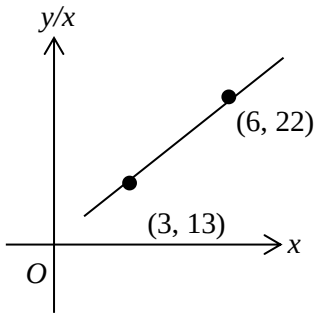
SKEMA PEMARKAHAN
KERTAS PEPERIKSAAN PERCUBAAN SPM 2022
DAERAH TANGKAK

BIL			JALAN PENYELESAIAN	SUB	MARK
1			$2j + 55 = 95$ $j = 20\ cm$ $20\theta = 55$ $\theta = 2.75\ rad$	 1 1	2
2	(a)			1	3
	(b)		$m = 3$ $a = 3, b = 4$	1 1	
3	(a)		2^2 or 3^4 $q^8 - p^4$	1 1	4
	(b)		Changing 6^{m+2} to $6^m(6^2)$ or 6^{m+1} to $6^m(6)$ $6^m[6^2 + 6 - 18]$ $6^m[24]$	1 1 1	
4			$V = \frac{1}{3}h^3 + 8h$ $\frac{dV}{dt} = 10\ cm^3 s^{-1}$ $cari\ \ \frac{dV}{dt} = ?\ \ apabila\ h = 2\ cm$ $\frac{dV}{dh} = h^2 + 8$ $\frac{dV}{dt} = \frac{dV}{dh} \times \frac{dh}{dt}$ $10 = (h^2 + 8) \times \frac{dh}{dt}$ $10 = ((2)^2 + 8) \times \frac{dh}{dt} \quad \therefore \frac{dh}{dt} = \frac{5}{6} cm$	 1 1 1, 1	

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5	(a)		$f(x) = 4x^2 + 18x - 5.$ $= 4(x^2 + \frac{18}{4}x - \frac{5}{4})$ $= 4[x^2 + \frac{18}{4}x + (\frac{9}{4})^2 - (\frac{9}{4})^2 - \frac{5}{4}]$ $= 4[(x + \frac{9}{4})^2 - \frac{101}{16}]$ $= 4[(x + \frac{9}{4})^2 - \frac{101}{4}$	1 1 1	7
	(b)		titik minimum, $(-\frac{9}{4}, -\frac{101}{4})$	1, 1	
	(c)		$f(x) = -4[(x + \frac{9}{4})^2 + \frac{101}{4}$	2	
6	(a)		$OQ : QB = 20$ $3 : 2 = 20$ $12 : 8 = 20$ $j = 12\ cm$ $\frac{1}{2}(12)^2(sin\ \theta) = 42.42$ $\theta = 0.6301\ rad$	1 1 1	6
	(b)		Luas berlorek $= \frac{1}{2}(20)^2(0.6301) - 42.42$ $= 83.6$	1,1 1	
7	(a)		$h(x) = \frac{x-2}{3}$	1	6
	(b)		$let\ y = \frac{x-2}{3}$ $h^{-1} = 3x + 2$	1 1	
	(c)		$gh(x) = x^2 - 4x - 1$ $gh(x)h^{-1}(x) = (x^2 - 4x - 1)h^{-1}(x)$ $g(x) = (3x + 2)^2 - 4(3x + 2) - 1$ $g(x) = 9x^2 - 5$	1 1 1	

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8	(a)		$m_{AB} = \frac{5-1}{-9-3}$ dan $m_{PQ} = \frac{5-(-4)}{1-a}$	1	6
			$m_{AB} \times m_{PQ} = -1$		
			$\left(\frac{5-1}{-9-3}\right) \times \left(\frac{5-(-4)}{1-a}\right) = -1$		
			$\left(-\frac{4}{12}\right)\left(\frac{9}{1-a}\right) = -1$	1	
			$a = -2$	1	
	(b)		$m_{AB} = \frac{5-1}{-9-3} = -\frac{4}{12}$	1	
			$m_{AB} = -\frac{1}{3}$		
			$y-(-4) = -\frac{1}{3}[x-(-2)]$ atau $-4 = -\frac{1}{3}(-2)+c$	1	
			$y = -\frac{1}{3}x - \frac{14}{3}$	1	
9	(a)		$\int_0^k \pi x^2\, dy = 6\pi$		5
			$\pi \int_0^k 4 - y dy = 6\pi$		
			$\left[4y - \frac{y^2}{2}\right]_0^k = 6$	1	
			$-k^2 + 8k - 12 = 0$		
			$k^2 - 8k + 12 = 0$	1	
			$(k-6)(k-2) = 0$		
			$k = 2$, $k = 6$		
			$\therefore k = 2$	1	
	(b)		$\int_1^3 2f(x)\, dx - \int_1^3 5\ dx$		
			$= 2\int_1^3 f(x)\ dx - [5x]_1^3$	1	
			$= 2(6) - [5(3) - 5(1)]$		
			$= 2$	1	

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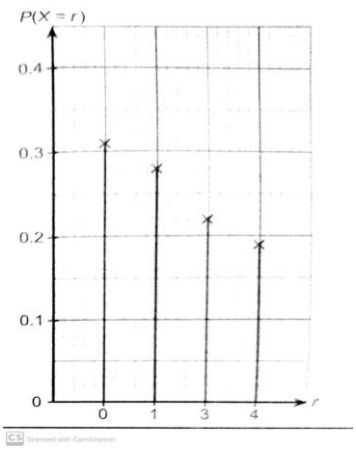
10	(a)		$T_{12} = 600 + 11(80)$ $= 1{,}480.00$	1 1	8
	(b)		$S_{60} = \frac{60}{2}[2(600) + 59(80)]$ $= 177600.00$	1 1	
	(c)		$\frac{n}{2}[2(600) + (n-1)(80)] \leq 500{,}000$ $n^2 + 14n - 12500 \leq 0$ $0 \leq n \leq 105.02$ $n = 105$ kedalaman = 105 x 2 = 210m.	1 1 1 1	
11	(a)	(i)	${}^7P_4 = 840$	1	6
		(ii)	$= \underline{1} \times \underline{5} \times \underline{4} \times \underline{3}$ $= 60$	1	
	(b)	(i)	$\frac{3}{5} \times \frac{1}{3} = \frac{1}{5}$	2	
		(ii)	$\left(\frac{3}{5} \times \frac{2}{3}\right) + \left(\frac{2}{5} \times \frac{1}{3}\right)$ $= \frac{6}{15} + \frac{2}{15}$ $= \frac{8}{15}$	1 1	
12			$X = r$ | 0 | 1 | 3 | 4 $P(X = r)$ | $\frac{11}{36} = 0.31$ | $\frac{5}{18} = 0.28$ | $\frac{2}{9} = 0.22$ | $\frac{7}{36} = 0.19$  	1 1	4

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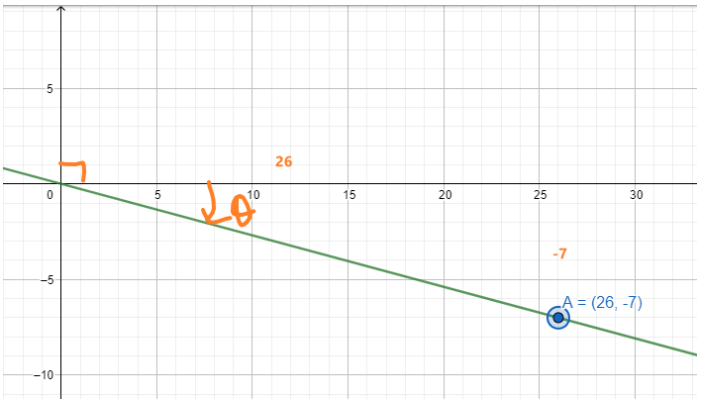
			$P(0 \le Y < 4) = \frac{11}{36} + \frac{5}{8} + \frac{2}{9}$	1	
			$= \frac{29}{36}$	1	
13	(a)		$\begin{pmatrix}20\\14\end{pmatrix} + \begin{pmatrix}7\\-21\end{pmatrix}$ $= \begin{pmatrix}27\\-7\end{pmatrix}$	1	7
			Magnitud $= \sqrt{27^2 + (-7)^2}$ $= \sqrt{778}$	1	
					
			$\tan\theta = \frac{7}{27}$ $\theta = 14.5345^0$	1	
			Arah bagi halaju paduan ikan itu/ *Direction of the resultant velocity of the fish* $= 90^0 + 14.5345^0$ $= 104.5345^0$	1 1	
	(b)		$\underline{u} - 2\underline{v} = a\underline{i} + b\underline{j} - 2\left(\underline{i} - 4\underline{j}\right)$	1	
			$\underline{u} - 2\underline{v} = (a-2)\underline{i} + (b+8)\underline{j}$		
			$\left\|\underline{u} - 2\underline{v}\right\| = \sqrt{(a-2)^2 + (b+8)^2}$		
			$a^2 + b^2 = (a-2)^2 + (b+8)^2$	1	
			$a^2 + b^2 = a^2 - 4a + 4 + b^2 + 16b + 64$		
			$a = 4b + 17$	1	

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14			$4y + 4x + 4(x + 5) = 154$ @ persamaan * di bawah	1	8
			$4y + 4x + 4x + 20 = 154$		
			$y = \frac{67-4x}{2}$	1	
			$2y(x + 5) + 2x(x + 5) + 2xy = 845$	1	
			$2x^2 + 4xy + 10y + 10x - 845 = 0$		
			$2x^2 + 4x\left(\frac{67-4x}{2}\right) + 10\left(\frac{67-4x}{2}\right) + 10x - 845 = 0$		
			$6x^2 - 124x + 510 = 0$ @ $3x^2 - 62x + 255 = 0$		
			$x = \frac{-(-124) \pm \sqrt{(-124)^2 - 4(6)(510)}}{2(6)}$	1	
			@ $(3x - 17)(x - 15) = 0$ $x = 5\frac{2}{3}$ @ $x = 15$	1	
			$y = \frac{67 - 4(5\frac{2}{3})}{2}$ @ $y = \frac{67 - 4(15)}{2}$		
			$y = 22\frac{1}{6}$ @ $y = 3.5$	1	
			Diberi x > y, maka x = 15 dan y = 3.5		
			Isipadu bekas = $15 \times 3.5 \times (15 + 5)$ = 1050 cm^3	1	
			Isipadu jus minuman = 1000 ml = 1000 cm^3,		
			Maka 1000 ml jus minuman boleh dimuatkan dalam bekas tersebut.	1	

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15	(a)		$y = a\tan bx$	1	8
			$b = \frac{1}{2}$		
			$y = a\tan\frac{1}{2}x$	1	
			$\left(\frac{\pi}{2}, \frac{3}{2}\right)$		
			$\frac{3}{2} = a\tan\left(\frac{1}{2}\times\frac{\pi}{2}\right)$	1	
			$a = \frac{3}{2}$		
			$y = \left\|\frac{3}{2}tan\frac{1}{2}x\right\| / \ y = \frac{3}{2}\left\|tan\frac{1}{2}x\right\| / \ y = \left\|-\frac{3}{2}tan\frac{1}{2}x\right\|$	1	
	(b)		$3\ kos\ 2x = 8\sin x - 5$		
			$3(1 - 2sin^2x) = 8\sin x - 5$	1	
			$3 - 6sin^2x = 8\ sinx - 5$		
			$6\ sin^2x + 8\sin x - 8 = 0$		
			$3sin^2x + 4sinx - 4 = 0$		
			$(3sinx - 2)(sinx + 2) = 0$	1	
			$\sin\ x = \frac{2}{3}, \sin x = -2(rejected)$	1	
			$x = 41.81°, 138.19°$	1	