PEPERIKSAAN PERCUBAAN SPM TAHUN 2022

PERATURAN PEMARKAHAN MATEMATIK TAMBAHAN KERTAS 1

Nombor		Jawapan	Markah
1	(a)	$\frac{dy}{dx} = 6x^2 - 12x - 18$ K1 $\frac{dy}{dx} = -18$ N1	**6**
	(b)	$(x+1)(x-3) = 0$ K1 $x = -1 \quad atau \quad x = 3$ K1 $\frac{d^2y}{dx^2} = 12(-1) - 12 = -24$ K1 $(-1,14)$ N1	
2	(a)	$m = \frac{3-(-3)}{4-1} = \frac{6}{3} = 2$ Y = Mx + c ,dan/and (4,3) $\frac{1}{y} = 2\left(\frac{1}{x}\right) + c$ 3 = 2(4) + c C = -5 N1 $\frac{1}{y} = 2\left(\frac{1}{x}\right) - 5$ $\frac{1}{y} = \frac{2}{x} - 5$ $\frac{1}{y} = \frac{2-5x}{x}$ $y = \frac{x}{2-5x}$ N1	**4**
	(b)	$\frac{x}{2-5x} = 3$ K1 $x = 6 - 15x$ 16x = 6 $x = \frac{6}{16} = \frac{3}{8}$ N1	

3	**(a)**	$\begin{pmatrix} 5 \\ -12 \end{pmatrix}$ N1 $\sqrt{5^2 + (-12)^2}$ or 13 (seen) K1 $\frac{1}{13}\begin{pmatrix} 5 \\ -12 \end{pmatrix}$ N1	**6**
	(b)	$h + k = 0$ (seen) K1 $h = -k$ $- - - - -$ 1 h-k+2=0 ---------- 2 (-k)-k+2=0 K1 -2k = -2 k = 1 and h = -1 N1	
4	**(a)**	cos $\theta = \frac{4}{5}$ K1 0.6436 N1	**4**
	(b)	(a) $(5-4) + \sqrt{5^2 + 4^2} + 5(0.6436)$ or equivalent K1 OR * $AB = \sqrt{5^2 + 4^2}$ or AC=5(0.6436) seen, award K1 7.218 N1	
5		$a + 17d = 3(a + 5d)$ K1 $d = a$ N1 $\frac{12}{2}(2a + 11d) : \frac{4}{2}(2a + 3d)$ K1 $39 : 5$ N1	**4**

6	**(a)**	$\frac{1}{2}\begin{vmatrix} -1 & -4 & -6 & -1 \\ -3 & 0 & 2 & -3 \end{vmatrix}$ $= \frac{1}{2}\lvert (-8+18)-(12-2) \rvert$ *K*1 $= 0$, *bermaksud titik – titik adalah segaris.* *N*1	**5**
	(b)	$m_1 = \frac{p}{2}$ *or* $m_2 = -q^2 - 5$ *K*1 $(-q^2-5)\left(\frac{p}{2}\right) = -1$ *K*1 $q = \sqrt{\frac{2}{p} - 5}$ *N*1	
7	**(a)**	$\left[\frac{kx^2}{2}\right]$ @ $2\int_2^5 f(x)dx = 5(2)$ K1 $10 + \left[\frac{kx^2}{2}\right] = -\frac{1}{2}$ -1 K1 -1 N1	**6**
	(b)	$11(6)$ @ $\int_6^b f(x)dx = 19$ K1 $-11\int_6^b f(x)dx$ K1 -209 N1	
8	**(a)**	(i) 35 P1 (ii) $h(x) = x^2 - 1$ N1	**6**
	(b)	$f^2(x) = m^2x + mn + n$ K1 $m = 6$ N1 $6n + n = -21$ K1 $n = -3$ N1	

9	**(a)**	$\angle KOL = \pi - 2\alpha$ K1 $KL = 10(\pi - 2\alpha)$ K1 $10\pi - 20\alpha$ N1	**7**
	(b)	$\theta = 1$ N1 $\frac{1}{2}\times 10^2 \times (3.142 - 1)$ K1 $\frac{1}{2}\times 10^2 \times [(3.142-1) - \sin 122.71]$ K1 65.03 N1	
10		$\lvert\underline{u}\rvert = 5$ (seen) P1 $\sqrt{(1-p)^2 + q^2} = 5$ K1 $1 - 2p + p^2 + q^2 = 25$ $q^2 = 2p - p^2 + 24$ K1 $q = \pm\sqrt{2p - p^2 + 24}$ N1	**4**
11	**(a)**	$\frac{(n+2)(n+1)n((n-1)!}{(n-1)!} = 30n$ *K*1 $(n+2)(n+1) = 30$ *K*1 $n = 4$ *N*1	**6**
	(b)	Bilangan tanpa syarat, $\frac{4!}{2!} = 12$ *K*1 Bilangan digit 7 diikuti 2, $3! = 6$ *K*1 Maka, $12 - 6 = 6$ *N*1	
12	**(a)**	$3(1-\cos^2 x) + \cos x - 1 = 0$ K1 $(3\cos x + 2)(\cos x - 1) = 0$ K1 $0^o, 131^o 49', 228^o 11', 360^o$ *or* $0^o, 131.81^o, 228.91^o, 360^o$ N1	**6**
	(b)	**(i)** $\sin\theta = \frac{\sqrt{t^2-1}}{t}$ N1 (ii) $\frac{\tan\pi - \tan\theta}{1 + \tan\pi\tan\theta}$ $-\tan\theta$ K1 $-\sqrt{t^2-1}$ N1	

13	**(a)**	*(a)* $m(x) = 8x^2 - kx - (5-k)$ $= 8\left(x^2 - \frac{k}{8}x\right) - (5-k)$ $= 8\left[x^2 - \frac{k}{8}x + (\frac{-k}{16})^2 - (\frac{-k}{16})^2\right] - (5-k)$ K1 $= 8\left(x^2 - \frac{k}{16}\right)^2 - \frac{k^2}{32} - (5-k)$ K1 $= 8\left(x^2 - \frac{k}{16}\right)^2 - \frac{k^2}{32} + k - 5$ N1	**8**
	(b)	(a) $-\frac{k^2}{32} + k - 5 = -\frac{25}{8}$ K1 $\frac{k^2}{32} - k + 5 = -\frac{25}{8}$ $k^2 - 32k + 60 = 0$ $(k-2)(k-30) = 0$ $k = 2$ atau/ or $k = 30$ $\therefore k = 2\ (k < 5)$ K1	
	(c)	(a) $m(x) = 8x^2 - 2x - (5-2)$ $m(x) = 8x^2 - 2x - 3$ $n(x) = 7x^2 + p - 1$ $8x^2 - 2x - 3 = 7x^2 + p - 1$ $x^2 - 2x - p - 2 = 0$ K1 $b^2 - 4ac > 0$ $(-2)^2 - 4(1)(-p-2) > 0$ K1 $4p + 12 > 0$ $p > -3$ N1	

14	**(a)**	$5^n[5^2-1-5^3 5^{-2}]=k[5^n]$ $K1$ $5^n[25-1-5]=5^n[k]$ $K1$ $5^n[19]=5^n[k]$ $k=19$ $N1$	**8**
	(b)	$\frac{80-16\sqrt{5}+4}{\sqrt{5}-1}\times\frac{\sqrt{5}+1}{\sqrt{5}+1}$ $K1$ $\frac{68\sqrt{5}+4}{4}$ $K1$ $p=17$ $N1$ $q=1$ $N1$	
	(c)	$\log_3 p^{\frac{1}{2}}$ $\frac{1}{2}\log_3 p$ $\frac{1}{2}m$ $N1$	
15	**(a)**	(a) $n=3$ ----------N1 $k=1-\frac{6}{125}-\frac{36}{125}-\frac{64}{125}=\frac{19}{125}$ ---------- K1 $P(X=3)=\ {}^3C_3p^3q^0=\frac{64}{125}$ $p=\frac{4}{5}$ ----------N1	**8**
	(b)(i)	$\mu=np\ atau\ \sigma^2=npq$ $3=np$ $0.75=npq$ ---------- K1 $0.75=3q$ $q=0.25$ $p=0.75$ ---------- N1 $n=4$ ---------- N1	
	(b)(ii)	$P(X=2)=\ {}^4C_2\,(0.75)^2(0.25)^2$ ---------- K1 $=0.2109$ ---------- N1	