SOALAN PEPERIKSAAN PERCUBAAN SPM 2021
PERATURAN PEMARKAHAN KERTAS 1
SET 2

SOALAN	PERATURAN PEMARKAHAN	MARKAH	JUMLAH MARKAH
1. (a)	i-Julat = { 0, 1, 16 } ii- Hubungan banyak kepada satu	N1 N1	2
(b)	i-f(4) = 9(4)-2 $\quad$ = 36-2 $\quad$ = 34 ii- f(x) = 16 $\qquad$ 9x-2 =16 $\qquad\quad x = 2$ iii- $f^2 = 9(9x - 2)-2$ $\qquad = 81x - 20$	N1 N1 K1 N1	4
			6 M
2 (a)	Q (0,-11)	N1	1
(b)	$f(x) = -x^2 + mx - 11$ $= -[\,x^2 - mx\,] - 11$ $= -[\,(x - \frac{m}{2})^2 - (-\frac{m}{2})^2\,] - 11$ $= -\left(x - \frac{m}{2}\right)^2 + \frac{m^2}{4} - 11$ $\quad 3 = \frac{m}{2} \qquad k = \frac{6^2}{4} - 11$ $\qquad m = 6 \qquad\quad = -2$	P1 N1 N1N1	4
			5 M

3. (a)	$$\frac{3}{\sqrt{7}-4} \times \frac{\sqrt{7}+4}{\sqrt{7}+4}$$	K1	
	$$\frac{3(\sqrt{7}+4)}{(\sqrt{7}-4)\sqrt{7}+4}$$		2
	$$\frac{3\sqrt{7}+12}{-9}$$		
	$$\frac{\sqrt{7}+4}{-3}$$	N1	
(b)	$$log_2\, x^2 + log_2\, x = \frac{3}{4}$$		
	$$log_2\, x^3 = \frac{3}{4}$$	P1	
	$$x = 2^{\frac{1}{4}}$$	K1	3
	$$x = 1.1892$$	N1	
(c)	$2^{n-1} \times 8^n = 2048$ $2^{n-1} \times 2^{3n} = 2^{11}$		
	$2^{n-1+3n} = 2^{11}$	K1	2
	$n - 1 + 3n = 11$		
	$n = 3$	N1	
			7 M
4.	$\frac{1536}{1924} = \frac{2304}{1536} = 1.5$ ATAU a=1024 dan r = 1.5	P1	
	$T_n = 26244$, $1024(1.5)^{n-1} = 26\,244$	K1	5
	$(1.5)^{n-1} = 25.\,629$		
	$n - 1 = \frac{\log_{10} 25629}{\log_{10} 1.5}$	K1	
	$n - 1 = 8,$ $n = 9$	N1	
	$S_9 = \frac{1024(1.5^n - 1)}{1.5 - 1}$	N1	
	$= 76\,684$		
			5 M
5.	Katakan panjang sisi : x dan y Perimeter : $4x + 4y = 32\; atau\; x + y = 8$	P1	
	$Luas$: $x^2 + y^2 = 34$ $x^2 + (8-x)^2 = 34$ $2x^2 - 16x + 30 = 0$	K1 K1	5

	$(x-3)(x-5)=0, \quad x=3, \; 5$	K1	
	Jawapan : Panjang sisi jubin ialah 3 cm dan 5 cm.	N1	5 M
6. (a)	$\sin x = \kos 2x$ $\sin x - \kos 2x = 0$ $\sin x - (1 - 2\sin^2 x) = 0$ $2\sin^2 x + \sin x - 1 = 0$ $\sin x = \dfrac{1}{2}, \; x = 30^0, 150^o$ $\sin x = -1, x = 270^o$	K1 K1 N1	3
(b)	$\dfrac{\tan A - \tan B}{1 + \tan A \tan B} = \dfrac{12}{5}$ $5(\tan A - \tan B) = 12(1 + \tan A \tan B)$ $5\left(\dfrac{2}{3}\right) - 5\tan B = 12 + 12\left(\dfrac{2}{3}\right)\tan B$ $\tan B = -\dfrac{2}{3}$	K1 N1	2 5 M
7.	$\log_3 y = \log_3 x^{2n} - \log_3 k$ $\log_3 y = 2n \log_3 x - \log_3 k$ m=2n , $c = -\log_3 k$ $\dfrac{0-(-2)}{1-0} = 2n, \; -2 = -\log_3 k$ n = 1 $\qquad$ k = 9	K1 P1 (either) K1K1 N1 N1	6 6 M
8. (a)	(a) $\sqrt{-12^2 + 9^2} = 15$ unit	K1 N1	2
(b)	b) $\begin{pmatrix} -2 \\ 11 + p \end{pmatrix}$ p = -11	K1 N1	2
(c)	(c) $4 + q = 0$ $q = 0$ $p + q - 3 = 0$ $p = 7$	N1 N1	2 6 M
9. (a)	$\text{had}_{x \to a} \dfrac{\sqrt{x}-3}{x-9} \circ \dfrac{\sqrt{x}+3}{\sqrt{x}+3}$ $\dfrac{1}{\sqrt{a}+3} = \dfrac{1}{6}$	K1 K1	3

	$a = \pm 16$	N1	
(b)	$\dfrac{dy}{dx} = \dfrac{-2x+2}{x^3}$	P1	
	$= \dfrac{-2(4)+2}{(4)^3}$	K1	3
	$= -\dfrac{3}{32}$	N1	
			6 M
10. (a)	$\frac{1}{4}\left(-\frac{7}{2}\right)$ $-\dfrac{7}{8}$	K1 N1	2
(b)	$2q[x]_3^6 = 16$ $k = \dfrac{8}{3}$	K1 N1	2
			4 M
11.(a)	$6P_3$ 120	K1 N1	2
(b)	$3C_2 + 3C_3$ 4	K1 N1	2
			4 M
12.(a)	$0 = \dfrac{2x-4}{3} \ OR -3 = \dfrac{2y-6}{3}$ $\left(2, -\frac{3}{2}\right)$	K1 N1	2
(b)	$y - 2 = \dfrac{3}{4}(x + 1)$ $4y = 3x + 11$	K1 N1	2
(c)	(i) Suatu bulatan berpusat di Q dengan jejari $\frac{5}{2}\ unit.$ (ii) $\sqrt{(x-2)^2 + (y+\frac{3}{2})^2} = \frac{5}{2}$ $x^2 + y^2 - 4x + 3y = 0$	P1 K1 N1	3 7 M
13. (a)	$\theta = 1\ rad$	K1	

	S/panjang lengkung = $6\ cm$	K1	
	Panjang dawai = $6 + 6 + 6$	K1	4
	18 cm	N1	
(b)	$\angle AOB = 2.183\ rad$	K1	
	Jejari bulatan besar = 10.81 cm	K1	4
	Perimeter = 13.1 + 23.6 + 4.81 + 4.81	K1	
	46.32 cm	N1	
			8 M
14. (a)	$$10C8 \left(\frac{3}{5}\right)^8 \left(\frac{2}{5}\right)^2 + 10C9 \left(\frac{3}{5}\right)^9 \left(\frac{2}{5}\right)^1$$ $$+ 10C10 \left(\frac{3}{5}\right)^{10} \left(\frac{2}{5}\right)^0$$	K1K1K1	4
	0.1673	N1	
(b) i-	$0.5 = \dfrac{X - 54}{12}$	K1	
	$60\ kg$	N1	
ii-	$\left(Z > \dfrac{48 - 54}{12}\right)$	K1	4
	0.6915	K1	
	69.15%	N1	8 M
15. (a)	$9 = 3k(2) + 5$	K1	
	$k = \dfrac{2}{3}$	N1	2
(b)	$\dfrac{dy}{dx} = 4x + 3px^2$	K1	
	$7 = 4(-2) + 3p(-2)^2$	K1	3

	$p = \dfrac{5}{4}$	N1	
(c)	$\left[\dfrac{x^2}{2} + x\right]_4^a$	K1	3
	$\left[\dfrac{a^2}{2} + a\right] - \left[\dfrac{4^2}{2} + 4\right]$	K1	
	$\dfrac{a^2}{2} + a - 12$	N1	8 M