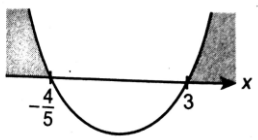
SOALAN PEPERIKSAAN PERCUBAAN SPM 2021

PERATURAN PEMARKAHAN KERTAS 1

SET 1

SOALAN	PERATURAN PEMARKAHAN	MARKAH	JUMLAH MARKAH
1 (a)	$h(x) = \frac{x-2}{3}$	N1	1
(b)	let y = $\frac{x-2}{3}$ $x = 3y + 2$ $h^{-1}(x) = 3x + 2$	K1 N1	2
(c)	$gh(x) = x^2 - 4x - 1$ $gh(x)h^{-1}(x) = (x^2 - 4x - 1)h^{-1}(x)$ $g(x) = (3x + 2)^2 - 4(3x + 2) - 1$ $g(x) = 9x^2 - 5$	P1 K1 N1	3 6 M
2 (a)	$x + 12 < 5x(x - 2)$ $x + 12 < 5x^2 - 10x$ $5x^2 - 11x - 12 > 0$ $let \quad 5x^2 - 11x - 12 = 0$ $(x - 3)(5x + 4) = 0$ $x = 3, x = -\frac{4}{5}$  $x < -\frac{4}{5}$, $x > 3$	P1 K1 N1	3

2 (b)	$f(x) = -2x^2 + 8x - 7$ $= -2[x^2 - 4x] - 7$ $= -2[(x-2)^2 - (-2)^2] - 7$ $= -2(x-2)^2 + 1$ Titik maksimum f(x) : (2, 1)	K1 N1	2 5
3 (a)	$3(7^x) = 65$ $7^x = \frac{65}{3}$ $\log 7^x = \log \frac{65}{3}$ $x = 1.58$	K1 N1	2
(b)	$x + 4 = \sqrt{x+10}$ $(x+4)^2 = x + 10$ $x^2 + 7x + 6 = 0$ $(x+1)(x+6) = 0$ $x = -1, -6$	K1 N1 (both)	2
(c)	$log_3\ (3x) = log_x 81 + 1$ $log_3\ 3 + log_3\ x = \frac{log_3 81}{log_3 x} + 1$ $1 + log_3\ x = \frac{4}{log_3 x} + 1$ $(log_3\ x)^2 = 4$ $log_3\ x = \pm 2$ $x = 3^2$, $x = 3^{-2}$ $= 9$ $= \frac{1}{9}$	K1 N1 (both)	2 6 M
4 (a)	Peratus Faedah = $\frac{2100-2000}{2000} \times 100$ 5%	K1 N1	2
(b)	$a = 2000, r = 1.05, n = 5$ (*either one correct, award 1 mark) $T_5 = (2000)(1.05)^4$ RM2431.01	P1 K1 N1	3 5M

5	Perimeter = 72 $2(40-y)+2(x-6) = 72$ $x-y=2$ .....(1) Luas / Area = 300 $40x-(40-y)(x-6)=300$ $240+xy-6y-300=0$ .....(2) $x=2+y$ .....(3) Gantikan persamaan (3) dalam persamaan (2) $240+(2+y)y-6y-300=0$ $y^2-4y-60=0$ $(y-10)(y+6)=0$ $y=10, y=-6\ (no\ solution)$ $x=12, \quad y=10$	P1 P1 K1 K1 N1 N1	6 6 M
6 (a)	$6\left(\frac{cos\theta}{sin\theta}\right)=7-\left(\frac{sin\theta}{cos\theta}\right)$ $6cos^2\theta=7sin\theta cos\theta-sin^2\theta$ $(6cos\theta-sin\theta)(cos\theta-sin\theta)=0$ $tan\,\theta=6 \quad tan\,\theta=1$ $\theta=45°, 80°32', 225°, 260°32'$	P1 K1 N1	3
(b)	$\cos(90°-\theta) = cos90°cos\theta+sin90°sin\theta$ $=sin\theta$ $=\sqrt{1-m^2}$	K1 N1	2 5 M
7. (a)	$m=\frac{5-2}{4-1}$ = 1 c = 1 $\frac{y}{x}=x^2+1$	K1 N1 N1	3
(b)	$y=x(x^2+1)$ $y=x^3+x$	K1 N1	2 5 M
8. (a)	k = 2 m= 15	N1 N1	2

(b)	i. $\begin{pmatrix}7\\-1\end{pmatrix}+\begin{pmatrix}h\\3\end{pmatrix}=\begin{pmatrix}7+h\\2\end{pmatrix}$ ii. $\sqrt{(7+h)^2+2^2}=\sqrt{148}$ $h^2+14h-95=0$ *h= 5 atau h = -19*	N1 K1 N1	3
			5 M
9 (a)	-3	N1	1
(b)	$f'(x)=-\frac{6}{5}x^{-3}$ $=-\frac{48}{5}$	K1 N1	2
(c)	$\frac{dy}{dx}=8x+2$ $8(k)+2=-6$ $k=-1$	K1 K1 N1	3
			6 M
10. (a)	$\frac{2}{3}(-9)$ -6	K1 N1	2
(b)	$k[x]_1^5=\frac{23}{3}$ $k=\frac{23}{12}$	K1 N1	2
			4 M
11. (a)	$6P_2\times 7P_2$ 1260	K1 N1	2
(b)	${}^8C_4\times{}^5C_2$ 700	K1 N1	2
			4 M
12. (a)	$h=3$ $k=1$	N1 N1	2
(b)	$h+4=3$ $h=-1$	K1 N1	2
(c)	(i) Pembahagi dua sama serenjang bagi PQ.	P1	

	(ii) $\sqrt{(x-1)^2+(y+1)^2} =$ $\sqrt{(x-6)^2+(y-4)^2}$	K1	3
	$10x + 10y - 50 = 0$	N1	7 M
13. (a)	$kos\ \theta = \frac{24}{30}$	K1	2
	$\angle AOB = 1.287\ rad$	N1	
(b)	$30 \times 1.287\ rad$	K1	2
	$38.61\ cm^2$	N1	
(c)	$\frac{1}{2} \times 30^2 \times (2 \times 3.142 - 1.287)$	K1 K1	4
	$+ \frac{1}{2}(30)(30)\sin 73.74$	K1	
	$2680.65\ cm^2$	N1	
			8 M
14 (a) i-	$\sqrt{10\left(\frac{1}{3}\right)\left(\frac{2}{3}\right)}$	K1	4
	1.4907	N1	
ii-	$1 - 10C0\left(\frac{1}{3}\right)^0\left(\frac{2}{3}\right)^{10}$	K1	
	0.9827	N1	
(b) i-	$\left(Z > \frac{45-40}{5}\right)$	K1	4
	0.1587	N1	
ii-	$P\left(\frac{35-40}{5} < Z < \frac{47.8-40}{5}\right)$	K1	
	0.78196	N1	
			8 M

15 (a) i-	$= 3x^2 - x^3 + \frac{1}{2}$ $\frac{dy}{dx} = 6x - 3x^2$	K1 N1	
ii-	$6x - 3x^2 = 0$ $\left(0, \frac{1}{2}\right)$ $\left(2, \frac{9}{2}\right)$	K1 N1 N1	5
(b)	$y = 6x + c$ $c = -9$ $y = 6x - 9$	K1 N1 N1	3 8 M