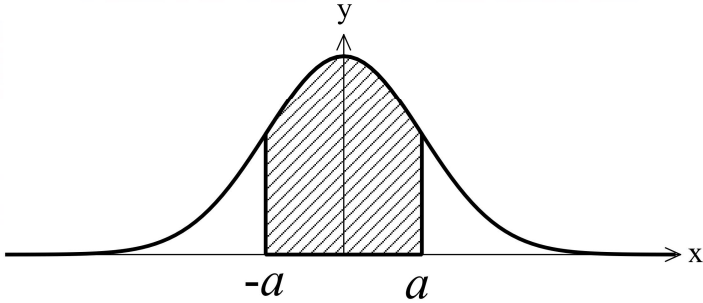


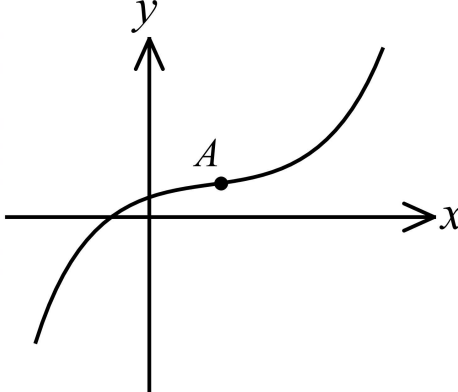
**PERATURAN
PEMARKAHAN
MATEMATIK TAMBAHAN**

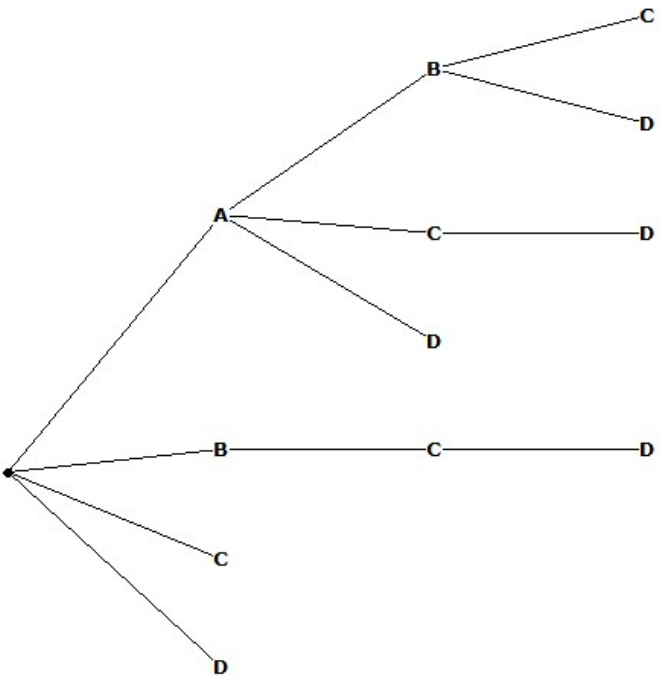
**KERTAS 1 SET 02
3472/1 (PP)**

**PEPERIKSAAN PERCUBAAN SPM 2021
JABATAN PELAJARAN NEGERI KEDAH**

No.	Solution and Mark Scheme	Sub Marks	Total Marks
1 (a) (i)	$n=1$ N1	1	7
1 (a) (ii)	$3\left[\frac{m}{3(-1)-1}\right] + \frac{m}{3(1)-1} = -1$ K1 $m=4$ N1	2	
1 (b)	$p+2q=2$ or $2p+2q=5$ K1 $k^{-1}(x)=x-2$ K1 $p=3$ N1 $q=-\frac{1}{2}$ N1	4	
2 (a)	$k=1$ N1 $h=-4$ N1	2	4
2 (b)	Shape of graph and maximum point at (1,9) P1 All points (-2,0),(4,0),(5,-7) correct N1	2	
3 (a)	$3x-1=e^2$ K1 $x=\frac{e^2+1}{3}$ N1	2	5
3 (b)	3^3 seen P1 $p^3=(q+1)^3$ K1 $q=p-1$ N1	3	
4 (a) (i)	 PIN1	2	6
4 (a) (ii)	$1-2P(Z \geq a)$ 0.9160 N1	1	
4 (b) (i)	$Z = \frac{h+2-h}{\sqrt{k}}$ K1 for substitute μ or σ into the formula $Z = \frac{2}{\sqrt{k}}$ N1	2	
4 (b) (ii)	$Z = \frac{1}{2}$ N1	1	

No.	Solution and Mark Scheme	Sub Marks	Total Marks
5 (a)	$\pi d + 2\pi d + 4\pi d + 8\pi d + 16\pi d + 32\pi d + 64\pi d + 128\pi d$ or $r = 2$ seen K1 $\pi d + 2\pi d + \dots + 128\pi d = 255\pi$ or $\frac{\pi d(2^8 - 1)}{2 - 1} = 255\pi$ K1 $d = 1$ N1	3	5
5 (b)	$\pi(16d)^2 + \pi(32d)^2 + \pi(64d)^2 = p\pi$ or $\frac{1}{4}\pi[4^8 - 1] - \frac{1}{4}\pi[4^5 - 1] = p\pi$ K1 $p = 5376$ N1	2	
6 (a)	$\begin{pmatrix} -3 \\ 4 \end{pmatrix} + \begin{pmatrix} 8 \\ 15 \end{pmatrix}$ K1 $(5, 19)$ or $\begin{pmatrix} 5 \\ 19 \end{pmatrix}$ N1	2	4
6 (b)	Distance = $\sqrt{8^2 + 15^2}$ K1 = 17 km N1	2	
7 (a)	$a + b = 1$ or $3a + b = -5$ K1 $a = -3$ and $b = 4$ N1	2	
7 (b)	$\frac{y}{x} = -3x + 4$ or $Y = -3X + 4$ K1 $k = 1$ and $h = \frac{4}{3}$ N1	2	4

No.	Solution and Mark Scheme	Sub Marks	Total Marks
8 (a)	$\left(\frac{y-1}{x-1}\right)\left(\frac{y-1}{x-5}\right) \text{ or Centre of circle } = (3,1) \quad \text{K1}$ $\left(\frac{y-1}{x-1}\right)\left(\frac{y-1}{x-5}\right) = -1 \text{ or } \sqrt{(x-3)^2 + (y-1)^2} = 2 \quad \text{K1}$ $x^2 + y^2 - 6x - 2y + 6 = 0 \quad \text{N1}$	3	7
8 (b)	$x^2 + x^2 - 6x - 2x + 6 = 0 \quad \text{K1}$ $x = 1 \text{ (ignore) or } x = 3 \quad \text{N1}$ <p>[SS - 1 if use $x = 1$]</p> $\frac{y-3}{x-3} = \frac{1-3}{5-3} \quad \text{K1}$ $y = 6 - x \quad \text{N1}$	4	
9 (a)	$\theta = 2 \text{ rad}$	1	
9 (b)	$QS = 6 - r \text{ or } PR = 6 - r \text{ or } RS = 12 \quad \text{P1}$ $\text{Perimeter} = 2r + 6 - r + 12 + 6 - r \quad \text{K1}$ $= 24\text{cm} \quad \text{N1}$	3	4
10 (a)	 <p>Or any shape that shows A is the inflexion/inflection point P1</p>	1	4
10 (b)	$\lim_{x \rightarrow 3} \frac{9 - x^2}{4 - \sqrt{x^2 + 7}} = \lim_{x \rightarrow 3} \frac{9 - x^2}{4 - \sqrt{x^2 + 7}} \times \frac{4 + \sqrt{x^2 + 7}}{4 + \sqrt{x^2 + 7}} \quad \text{K1}$ $= \lim_{x \rightarrow 3} \left(4 + \sqrt{x^2 + 7}\right) \quad \text{K1}$ $= 8 \quad \text{N1}$	3	

No.	Solution and Mark Scheme	Sub Marks	Total Marks
11 (a)	$8 + \left \int_0^b g(x) dx \right = 10$ K1 $\int_0^b g(x) dx = -2$ N1	2	6
11 (b) (i)	$V = -\frac{2t^2}{2} + c$ K1 $V = -t^2 + 4$ N1	2	
11 (b) (ii)	$-t^2 + 4 = 0$ K1 $t = 2$ N1 [SS -1 if given $t = -2$]	2	
12 (a) (i)	${}^{11}C_5 = 462$ N1	1	8
12 (a) (ii)	6C_2 or 3C_1 seen K1 $1 \times {}^6C_2 \times {}^3C_1 \times 1 + 1 \times {}^6C_3 \times 1$ K1 $= 65$ ways N1	3	
12 (b)	 <p>Any of these branches seen ABC, ABD, ACD, BCD N1 All four shown N1N1 More than or less than four branches seen SS-1</p>	2	
12 (c)	8P_4 seen K1 $2 \times {}^8P_4 = 3360$ ways N1	2	

No.	Solution and Mark Scheme	Sub Marks	Total Marks
13 (a)	$x+1=2y$ K1 $xy=3$ K1 $x=2y-1$ P1 $(2y-3)(y+1)=0$ K1 Height of window = 1.5m N1 [SS-1 if given $y=-1$]	5	8
13 (b)	$x=2$ N1 Perimeter = $3+3+1.5+1.5$ K1 $=9$ m N1	3	
14 (a)	$\frac{1}{2}x(x+3) \leq 27$ K1 $(x+9)(x-6)$ K1 $0.5 \leq x \leq 6$ N1 $3.5 \leq BD \leq 9$ N1	4	8
14 (b) (i)	$t=4$ or $h(t) = -\frac{15}{8}(t-4)^2 + 30$ K1 Maximum height = 30m K1	2	
14 (b) (ii)	$15t - \frac{15}{8}t^2 > 20$ N1 $2 \leq t \leq 6$ N1	2	
15 (a)	$\frac{\cos \theta}{\sin \theta}$ or $\frac{\sin \theta}{\cos \theta}$ is seen K1 $\frac{\cos^2 \theta + \sin^2 \theta}{\sin \theta \cos \theta}$ is seen K1	2	8
15 (b)	α and β in QIII is seen or $\cos \alpha = -\frac{3}{5}$ P1 $\cos\left(\frac{\alpha}{2}\right) = \sqrt{-\frac{\frac{3}{5}+1}{2}}$ K1 $\frac{1}{\sqrt{5}}$ N1	3	
15 (c)	$\frac{\cos \theta}{\sin \theta}$ or $\frac{\sin \theta}{\cos \theta}$ or $AB = 18 \sin \theta$ or $OA = 18 \cos \theta$ or $OB = 18$ is seen K1 $\frac{\cos^2 \theta + \sin^2 \theta}{\sin \theta \cos \theta}$ is seen K1 Perimeter = $18 \sin \theta + 2(18 \cos \theta) + 18 \sin \theta + 2(18 \cos \theta)$ K1 $= 36 \sin \theta + 72 \cos \theta$	3	