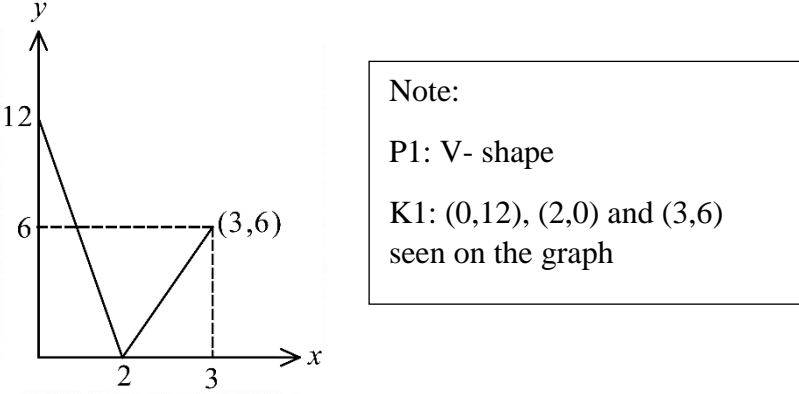
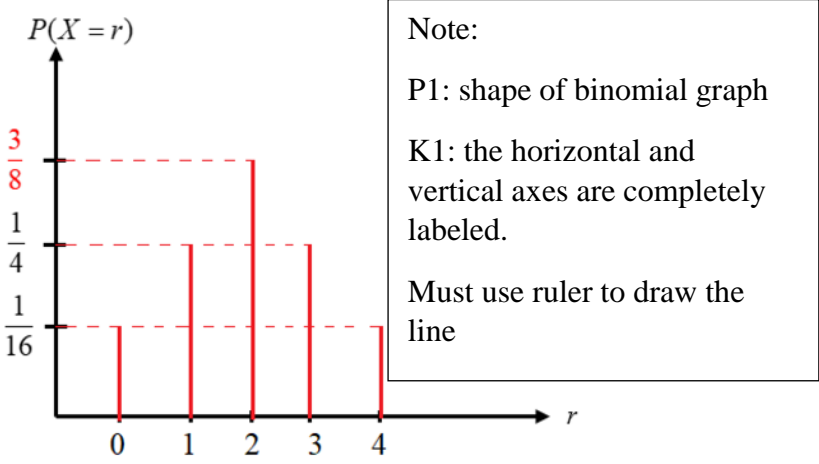


**PERATURAN
PEMARKAHAN
MATEMATIK TAMBAHAN**

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

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

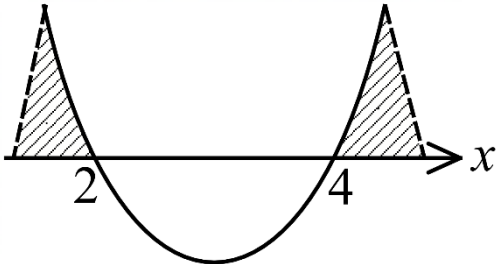
No.	Solution and Mark Scheme	Sub Marks	Total Marks
1(a)(i)	$f(n) = 0.8n - 24$ N1	3	
1(a)(ii)	$0 = 0.8n - 24$ K1 $n = 30$ N1		
1(b)	<p>Find the composite function of $hf(x)$</p> <p>$hf(x) = 12 - 6x$ or $y = 12 - 6x$ K1</p>  <p>Range $0 \leq y \leq 12$ N1</p>	4	7
2(a)(i)	$a > 0$ N1	2	
2(a)(ii)	$x = -1$ N1		
2(b)	$8 + 2k = 12$ K1 $k = 2$ N1	2	4

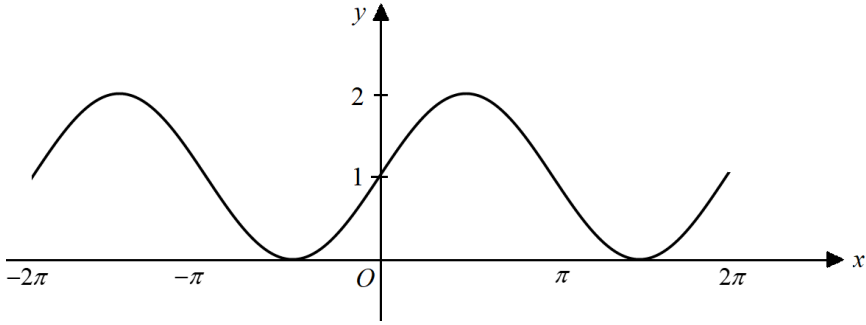
No.	Solution and Mark Scheme	Sub Marks	Total Marks																		
3(a)	<p><u>Rationalising using conjugate surds.</u></p> $(11 + \sqrt{3}) - \frac{169}{19 + 8\sqrt{3}} \times \frac{19 - 8\sqrt{3}}{19 - 8\sqrt{3}} \quad \text{K1}$ <p><u>Simplest form</u> K1</p> $-8 + 9\sqrt{3}$ <p>$a = -8$ and $b = 9$ (Both must be correct) N1</p>	3	5																		
3(b)	<p><u>Using law of indices</u></p> $2^{5(h+3)-6(2k-1)} = 2^3 \quad \text{or} \quad 2^{5(h+3)} = 2^{6(2k-1)+3} \quad \text{K1}$ $h = \frac{12k - 18}{5} \quad \text{N1}$	2																			
4(a)(i)	<table border="1" data-bbox="323 981 1080 1106"> <thead> <tr> <th>$X = r$</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Kebarangkalian</td> <td>$\frac{1}{16}$</td> <td>$\frac{1}{4}$</td> <td>$\frac{3}{8}$</td> <td>$\frac{1}{4}$</td> <td>$\frac{1}{16}$</td> </tr> <tr> <td>Probability</td> <td>$\frac{1}{16}$</td> <td>$\frac{1}{4}$</td> <td>$\frac{3}{8}$</td> <td>$\frac{1}{4}$</td> <td>$\frac{1}{16}$</td> </tr> </tbody> </table> <p>Seen $\frac{3}{8}$ N1</p>	$X = r$	0	1	2	3	4	Kebarangkalian	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{16}$	Probability	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{16}$	1	
$X = r$	0	1	2	3	4																
Kebarangkalian	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{16}$																
Probability	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{16}$																
4(a)(ii)	 <p>Note: P1: shape of binomial graph K1: the horizontal and vertical axes are completely labeled. Must use ruler to draw the line</p>	5	6																		
4(b)	$z < \frac{85 - 80}{15} \quad \text{K1}$ $1 - 0.3696 \quad \text{K1}$ $0.6304 \quad \text{N1}$																				

No.	Solution and Mark Scheme	Sub Marks	Total Marks
5(a)	$d = 4\pi$ P1 $\frac{7}{2}[2(2\pi r) + 6(4\pi)] = 140\pi$ K1 $r = 4$ N1	3	5
5(b)	$\frac{n}{2}[2(8\pi) + (n-1)(4\pi)] = 200\pi$ K1 number of completed circles = 8 N1	2	
6	$\begin{pmatrix} 3p \\ 2h \end{pmatrix} + \begin{pmatrix} -1 \\ 2 \end{pmatrix} + \begin{pmatrix} 1 \\ -2 \end{pmatrix} + \begin{pmatrix} h \\ m \end{pmatrix} = \begin{pmatrix} 5 \\ 3 \end{pmatrix}$ K1 <u>Two equations obtained and solved</u> K1 $3p + h = 5 \longrightarrow (1)$ $2h + m = 3 \longrightarrow (2)$ <u>Eliminated h by using substitution</u> $2(5 - 3p) + m = 3$ K1 $m = -7 + 6p$ or $m = 6p - 7$ N1	4	4
7(a)	<u>Used theorem Pythagoras</u> $\sqrt{5^2 - 4^2}$ K1 $A(0, 3)$ N1	2	4
7(b)	<u>Using law of logarithm</u> $\log_{10} y = \log_{10}(x+1)^{\frac{3}{4}} + \log_{10} 1000$ or $\log_{10} y = \log_{10} 1000(x+1)^{\frac{3}{4}}$ K1 $y = 1000(x+1)^{\frac{3}{4}}$ N1	2	

No.	Solution and Mark Scheme	Sub Marks	Total Marks	
11(a)	$\frac{1}{3}x^3 + \frac{3}{2}x^2 - 18x + c$ K1 $m = 3, n = 6$ (Both must be correct) N1 9 N1	3	6	
11(b)	Area of trapezium = $\frac{1}{2}(q+8)(p)$ K1 $\frac{1}{2}(q+8)(p) - 12$ K1 $\frac{pq+8p-24}{2}$ N1	3		
12(a)(i)	${}^n C_0 = \frac{n!}{(n-0)!0!}$ K1 $= \frac{n!}{n!(1)}$ $= 1$ N1	2	6	
12(a)(ii)	2×3 K1 6 N1	2		
12(b)	$\frac{8!}{3!}$ K1 $= 6720$ N1	2		
12(c)	${}^4 C_2 \times {}^4 C_2$ K1 OR ${}^6 C_2 \times {}^6 C_2$ $= 36$ N1 OR $= 225$			

No.	Solution and Mark Scheme	Sub Marks	Total Marks
13	<p><u>Equation of the area of papaya trees</u> $15x - (x - 5)(15 - y) = 115$ P1</p> <p><u>Equation of the area of papaya trees</u> $2(15 - y) + 2(x - 5) = 24$ P1</p> <p><u>Express x in terms of y / Express y in terms of x</u></p> <p>$x = y + 2 / y = x - 2$ P1</p> <p><u>Substitute x or y</u></p> <p>$5y = (y + 2)(y - 40)$ OR K1 $5(x - 2) = x(x - 2) - 40$</p> <p><u>Method to find x or y</u></p> <p>$y^2 - 3y - 40 = 0$ OR $x^2 - 7x - 30 = 0$</p> <p><u>Using factorise/Formula/Completing the square to find x or y.</u> K1</p> <p>$y = -5, y = 8$ OR $x = -3, x = 10$ N1</p> <p>Note: K0, N0 if no method to find x or y by using Factorisation/Formula/Completing the square.</p> <p><u>To find y or x using substitution</u></p> <p>$x = y + 2 / y = x - 2$</p> <p>$x = (8) + 2$ OR $y = (10) - 2$</p> <p>$x = 10$ $y = 8$ N1</p> <p><u>Area of pineapple plant</u> $7 \text{ m} \times 5 \text{ m}$ 35 m^2 N1</p>	8	8

No.	Solution and Mark Scheme	Sub Marks	Total Marks	
14(a)	$g(x) = -\left[x^2 - px + \left(-\frac{p}{2}\right)^2 - \left(-\frac{p}{2}\right)^2 + 6 \right] \text{ OR EQUIVALENT K1}$ $g(x) = -\left(x - \frac{p}{2}\right)^2 + \frac{p^2 - 24}{4}$ <p>$p = 6$ N1</p> <p>Using p to find the value of k.</p> $k = \frac{(6)^2 - 24}{4} \quad \text{K1}$ <p>$k = 3$ N1</p>	4	8	
14(b)	$B(0, -6)$ N1	1		
14(c)	$(x-4)(x-2) \geq 0$ K1  $x \leq 2, \quad x \geq 4$ N1	3		

No.	Solution and Mark Scheme	Sub Marks	Total Marks
15(a)	$\frac{1}{\sin\left(2x + \frac{\pi}{6}\right)} = 2 \quad \text{P1}$ $2x + \frac{\pi}{6} = 30^\circ \quad \text{K1}$ $2x + \frac{\pi}{6} = \frac{1}{6}\pi, \frac{5}{6}\pi, \frac{13}{6}\pi, \frac{17}{6}\pi \quad \text{OR equivalent K1}$ $x = 0, \frac{1}{3}\pi, \pi, \frac{4}{3}\pi \quad \text{N1}$	4	
15(b)	<p>Shape of sin graph P1</p> <p>2 cycles in $-2\pi \leq x \leq 2\pi$. P1</p> <p>Shifted upward 1 unit. P1</p> <p>Amplitude $0 \leq y \leq 2$ P1</p> <div style="text-align: center;">  </div>		