

SULIT

**PROGRAM GEMPUR KECEMERLANGAN
SIJIL PELAJARAN MALAYSIA 2021
NEGERI PERLIS**

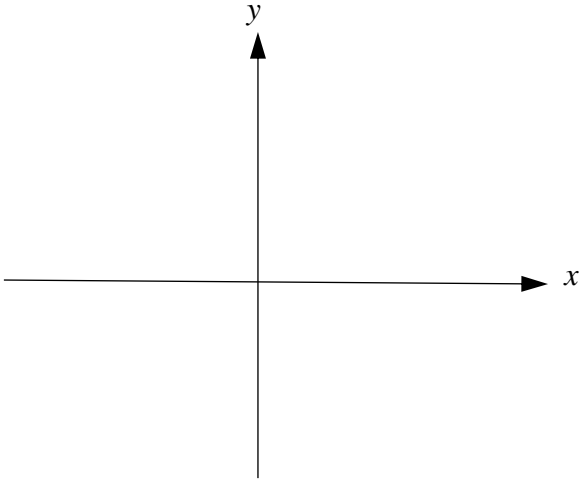
**SIJIL PELAJARAN MALAYSIA 2021
MATEMATIK TAMBAHAN
Kertas 1
Peraturan Pemarkahan
November**

3472/1(PP)

SET A

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 16 halaman bercetak

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>1</p> <p>(a)</p> <p>(b)</p>	<p>Find $g^{-1}(x)$ (K1) (K1) Find $fg(x)$</p> <p>$\frac{15+5}{2}$ @ 10 $(2x - 1)^2 + 1$</p> <p>$x = 1,4$ (N1)</p> 	<p>3</p> <p>2</p>	<p>5</p>

No.	Solution and Mark Scheme	Sub Marks	Total Marks
2	<p><u>Eliminate one variable</u> (K1)</p> $5x + 5y = 40$ <p>(K1) <u>Eliminate two variables</u></p> $5x = 25$ $x = 5$ $y = 3$ $z = -1$		5

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>3</p> <p>(a)</p>	<p>Find $s(7)$ or $s(7 + \delta t)$ P1</p> <p>63 or $(7 + \delta t)^2 + 2(7 + \delta t)$</p> <p>Find δs K1</p> <p>$63 + 16\delta t + (7 + \delta t)^2 - 63$</p> <p>Use $\lim_{\delta t \rightarrow 0} \frac{\delta s}{\delta t}$ K1</p> <p>$\frac{16\delta t + (\delta t)^2}{\delta t}$</p> <p>$16$ N1</p> <p>(b) P1 $2x$ or $6x(x^2 - 1)^2$ seen</p> <p>Use Quotient rule K1</p> <p>$\frac{(x^2 + 1)[6x(x^2 - 1)^2] - (x^2 - 1)^3(2x)}{(x^2 + 1)^2}$</p> <p>$\frac{4x(x^2 - 1)^2(x^2 + 2)}{(x^2 + 1)^2}$ N1</p>	<p>4</p> <p>3</p>	<p>7</p>

No.	Solution and Mark Scheme	Sub Marks	Total Marks
4	<div style="text-align: right; margin-bottom: 10px;">$\boxed{\text{P1}}$ $r = \frac{1}{\sqrt{2}-1}$ seen</div> <p>Use cylinder volume $\textcircled{\text{K1}}$</p> $\pi \left(\frac{1}{\sqrt{2}-1} \right)^2 (\sqrt{2} + 1)$ <p>Use surd conjugate $\textcircled{\text{K1}}$</p> $\pi \left(\frac{\sqrt{2}+1}{3-2\sqrt{2}} \right) \left(\frac{3+2\sqrt{2}}{3+2\sqrt{2}} \right)$ <div style="text-align: right; margin-top: 10px;">$(7 + 5\sqrt{2})\pi$ $\boxed{\text{N1}}$</div>	4	4

No.	Solution and Mark Scheme	Sub Marks	Total Marks
5 (a)	$\boxed{\text{P1}} \quad {}^3P_2 \text{ seen}$ ${}^3P_2 + {}^3P_2 + {}^3P_2 \text{ or } 3 \times {}^3P_2 \quad \textcircled{\text{K1}}$ $18 \quad \boxed{\text{N1}}$	3	
(b)	${}^4C_3 \times {}^4C_2 \text{ or } {}^4C_4 \times {}^4C_1 \quad \boxed{\text{P1}}$ ${}^4C_3 \times {}^4C_2 + {}^4C_4 \times {}^4C_1 \quad \textcircled{\text{K1}}$ $28 \quad \boxed{\text{N1}}$	3	6

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>6</p> <p>(a)</p>	<p>$SOR = -(c + 7)$ and $POR = 5c + 10$ P1</p> <p>$SOR_{new} = 2(\alpha + \beta)$ and $POR_{new} = 4\alpha\beta$ P1</p> <p><u>Write a new equation</u> K1</p> <p>$x^2 - (2(-c - 7))x + 4(5c + 10) = 0$</p> <p>$x^2 + (2c + 14)x + 20c + 40 = 0$ N1</p> <p>(b)</p> <p><u>Use $b^2 - 4ac > 0$</u> K1</p> <p>$(c + 7)^2 - 4(1)(5c - 10) > 0$</p> <p>$c > 3$ N1</p>	<p>4</p> <p>2</p>	<p>6</p>

No.	Solution and Mark Scheme	Sub Marks	Total Marks
7	<p data-bbox="193 528 225 562">(a)</p> <p data-bbox="320 528 719 584">Use $2 \times m_2 = -1$ (K1)</p> <p data-bbox="632 629 885 685">$m_2 = \frac{-1}{2}$ (N1)</p> <p data-bbox="312 730 1045 786">Use $\frac{y-y_1}{x-x_1} = m_2$ or other equivalent methods (K1)</p> <p data-bbox="408 831 560 887">$\frac{y-1}{x-9} = \frac{-1}{2}$</p> <p data-bbox="584 931 935 987">$2y + x - 11 = 0$ (N1)</p> <p data-bbox="193 1155 225 1189">(b)</p> <p data-bbox="320 1155 885 1200"><u>Solve simultaneous equations</u> (K1)</p> <p data-bbox="400 1234 568 1267">$5y - 25 = 0$</p> <p data-bbox="647 1335 871 1391">$B(1,5)$ (N1)</p>	4	6
		2	

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>8</p> <p>(a)</p>	$\frac{3p}{5p-2q} = \frac{2p+q}{3p} \quad \text{(K1)}$ $p = \frac{-q \pm \sqrt{q^2 - 4(1)(-2q^2)}}{2(1)} \quad \text{(K1)}$ $q = \frac{-p}{2} \quad \text{(N1)}$ <p>(b)</p> $5p - 3\left(\frac{-p}{2}\right), 3p, 2p + \left(\frac{-p}{2}\right), \dots \dots \quad \text{(P1)}$ $r = \frac{3p}{6p} \quad \text{(K1)}$ $\frac{1}{2} \quad \text{(N1)}$	<p>3</p> <p>3</p>	<p>6</p>

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>9</p> <p>(a)</p>	<p><u>Integrate $(y - 5)$</u> (K1)</p> $\frac{y^2}{2} - 5y$ <p>(K1) Use limit \int_5^k into $\frac{y^2}{2} - 5y$ and solve for k</p> $k^2 - 10k + 9 = 0$ <p>(N1) $k = 1$ and $k = 9$</p>	<p>3</p>	
<p>(b)</p>	<p>$3 \int_{-1}^4 g(x) dx$ (K1)</p> <p>60 (N1)</p>	<p>2</p>	<p>5</p>

No.	Solution and Mark Scheme	Sub Marks	Total Marks
10	<p style="text-align: center;"> P1 $\sqrt{1-t^2}$ seen </p> <p>(a) $Tan \theta = \frac{\sqrt{1-t^2}}{t}$ N1</p> <p>(b) $Sin(-\theta) = -\sqrt{1-t^2}$ N1</p> <p>(c) Use $2cos^2\theta - 1$ K1</p> <p style="text-align: center;">N1 $2t^2 - 1$</p>		5

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>11</p> <p>(a)</p>	$6(15 \times \theta) \text{ or } \frac{1}{2} \times 15^2 \times \theta \quad \boxed{\text{P1}}$ $2(15 \times 6) + 6(15 \times \theta) + 2\left(\frac{1}{2} \times 15^2 \times \theta\right) = 509.8 \quad \textcircled{\text{K1}}$ $1.047 \text{ rad} \quad \boxed{\text{N1}}$	3	
<p>(b)</p>	$\frac{1}{2} \times 15^2 \times (1.047) \times 6 \quad \textcircled{\text{K1}}$ $\boxed{\text{N1}} \quad 706.74 \text{ cm}^3$	2	5

No.	Solution and Mark Scheme	Sub Marks	Total Marks
12			
(a)	$k = -0.96$ N1	1	
(b)	$z = \pm 0.96$ N1		
	$\frac{57.64 - \mu}{3.5} = -0.96$ K1		
	N1 61	3	
			4

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>13</p> <p>(a)</p> <p>(b)</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p>	<p style="text-align: right;">$\boxed{\text{P1}}$ $\begin{pmatrix} -5 \\ 1+p \end{pmatrix}$ seen</p> <p>Use $\overrightarrow{OA} = \lambda \overrightarrow{AB}$ $\textcircled{\text{K1}}$</p> <p>$\begin{pmatrix} 3 \\ -1 \end{pmatrix} = \lambda \begin{pmatrix} -5 \\ 1+p \end{pmatrix}$</p> <p style="text-align: right;">$\lambda = \frac{-3}{5}$ $\boxed{\text{N1}}$</p> <p style="text-align: right;">$p = \frac{2}{3}$ $\boxed{\text{N1}}$</p> <p>$\overrightarrow{OA} = 3i + 4j$ $\boxed{\text{N1}}$</p> <p>$\overrightarrow{PQ} = \begin{pmatrix} -10 \\ 2 \end{pmatrix}$ $\boxed{\text{N1}}$</p> <p>Find \overrightarrow{PQ} $\textcircled{\text{K1}}$</p> <p>$\sqrt{(-10)^2 + 2^2}$</p> <p style="text-align: right;">$\frac{1}{\sqrt{104}} \begin{pmatrix} -10 \\ 2 \end{pmatrix}$ $\boxed{\text{N1}}$</p>	<p style="text-align: center;">4</p> <p style="text-align: center;">4</p>	<p style="text-align: center;">8</p>

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>14</p> <p>(a)</p>	<p>Find $\frac{dy}{dx}$ and equate to 0 (K1)</p> $3x^2 - 6x - 9 = 0$ $x = 3 \text{ and } x = -1$ (N1) <p>(3, -12) and (-1, 20) (N1)</p> <p>Find $\frac{d^2y}{dx^2}$ and substitute $x = 3$ or $x = -1$ (K1)</p> <p>(3, -12) is minimum point <u>or</u> (-1, 20) is maximum point (N1)</p> <p>(-1, 20) is minimum point <u>and</u> (-1, 20) is maximum point (N1)</p> <p>(b)</p> <p>Use $\frac{d^2y}{dx^2} = 0$ (K1)</p> $6x - 6 = 0$ <p>(1, 4) (N1)</p>	<p>6</p> <p>2</p>	<p>8</p>

No.	Solution and Mark Scheme	Sub Marks	Total Marks
<p>15</p> <p>(a)</p>	$\frac{1}{y} = \frac{2}{h} \left(\frac{1}{x} \right) + \frac{k}{h} \quad \boxed{\text{P1}}$ $m = \frac{2}{h} \quad \boxed{\text{N1}}$ $c = \frac{k}{h} \quad \boxed{\text{N1}}$ <p>(b)</p> <p>Substitute (1,8) into $y = \frac{hx}{kx+2}$ $\textcircled{\text{K1}}$</p> $8k + 16 = h$ $\textcircled{\text{K1}} \text{ y-intercept} = \frac{1}{6}$ $\frac{k}{h} = \frac{1}{6}$ $8k + 16 = 6k \quad \textcircled{\text{K1}}$ $\boxed{\text{N1}} \quad k = -8$ $\boxed{\text{N1}} \quad h = -42$	<p>3</p> <p>5</p>	<p>8</p>