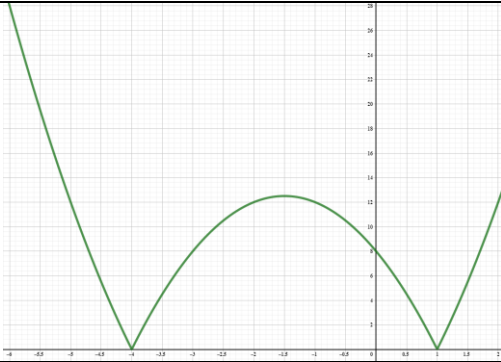


PEPERIKSAAN PERCUBAAN TAHUN 2022
PERATURAN PEMARKAHAN KERTAS 2

NOMBOR		JAWAPAN	MARKAH
1		$x = 10 - 2y$ K1 $5(10 - 2y)^2 - 2(10 - 2y)(y) = 24$ K1 $(3y - 17)(2y - 7) = 0$ K1 $y = \frac{17}{3}, y = \frac{7}{2}$ $x = -\frac{4}{3}, x = 3$ N1 $\left(-\frac{4}{3}, \frac{17}{3}\right), \left(3, \frac{7}{2}\right)$ N1	5
2	(a)	<p>Surd mempunyai nombor perpuluhan yang tidak berulang dan surd ialah suatu nombor tak nisbah. P1</p> <p>$\sqrt{3} = 1.7320508$ <i>ialah surd</i></p> <p>$\sqrt[3]{11} = 2.223980$ <i>ialah surd</i></p> <p>$\sqrt{\frac{1}{4}} = 0.5$ <i>bukan surd</i> P1</p> <p>$\sqrt[3]{27} = 3$ <i>bukan surd</i></p> <p>Boleh juga menggunakan nilai-nilai yang lain.</p>	7
	(b)	$2^3 (2^{2x-2}) = 2^{6x-3}$ K1 $2x + 1 = 6x - 3$ $x = 1$ N1	
	(c)	$\frac{\log_3 x}{\log_3 27} - \frac{\log_3 y}{\log_3 9}$ K1 $\frac{\log_3 3^p}{3} - \frac{\log_3 3^q}{2}$ K1 $\frac{p}{3} - \frac{q}{2}$ N1	

3	(a)	$p(3x-4)+q$ K1 $p=2$ N1 $-4(2)+q=5$ K1 $q=13$ N1	8
	(b)	(i) $x = \frac{4}{m-y}$ K1 $f^{-1}(x) = m - \frac{4}{x}, x \neq 0$ atau $f^{-1}(x) = \frac{mx-4}{x}, x \neq 0$ N1 (ii) $m^2 + 7 = 3 + (2+m)^2$ K1 $m=0$ N1	
4	(a)	$f(x) = 2 \left[x^2 + 3x + \left(\frac{3}{2}\right)^2 - \left(\frac{3}{2}\right)^2 - 4 \right]$ K1 $f(x) = 2 \left(x + \frac{3}{2} \right)^2 - \frac{25}{2}$ N1	7
	(b)	(i) $x = -\frac{3}{2}$ N1	
		(ii) Graf mempunyai titik minimum iaitu $\left(-\frac{3}{2}, -\frac{25}{2}\right)$ N1 kerana nilai $a > 0$	
	(c)		
		Punca-punca=1,-4 N1 Bentuk K1 Verteks pada $x = 1.5$ N1	

5	(a)	<p>Shape (cosine) N1 1 cycle N1 Amplitude N1 Modulus N1</p>	7
	(b)	$y = 2 + \frac{x}{\pi} \quad \text{K1}$ <p>Draw line $y = 2 + \frac{x}{\pi}$ N1</p> <p>Number of solutions = 4 N1</p>	
6	(a)(i)	$\begin{aligned} \vec{AC} &= \vec{AO} + \vec{OC} \\ &= -3\underline{x} - 2\underline{y} + 9\underline{x} + 2\underline{y} \\ &= 6\underline{x} \end{aligned} \quad \text{N1}$	
	(a)(ii)	$\begin{aligned} \vec{OM} &= \vec{OA} + \vec{AM} \\ &= \vec{OA} + \frac{1}{2}\vec{AC} \\ &= 3\underline{x} + 2\underline{y} + \frac{1}{2}(6\underline{x}) \\ &= 6\underline{x} + 2\underline{y} \end{aligned} \quad \text{N1}$	
	(b)(i)	$\begin{aligned} \vec{OB} &= \frac{3}{2}\vec{OM} \\ &= \frac{3}{2}(6\underline{x} + 2\underline{y}) \\ &= 9\underline{x} + 3\underline{y} \end{aligned} \quad \begin{array}{l} \text{K1} \\ \text{N1} \end{array}$	
	(b)(ii)	$\begin{aligned} \vec{OB} &= \vec{OC} + \vec{CB} \\ &= 9\underline{x} + 2\underline{y} + 3r\underline{y} \\ &= 9\underline{x} + (2 + 3r)\underline{y} \end{aligned} \quad \text{K1}$ <p>With compare,</p> $2 + 3r = 3 \quad \text{K1}$ $r = \frac{1}{3} \quad \text{N1}$	

7	(a)	$A = \frac{1}{2}x^2 \left(\frac{100-2x}{x} \right) \quad K1$ $A = 50x - x^2 \quad N1$	
	(b)	<p>(i) $\frac{dA}{dx} = 50 - 2x \quad K1$ $50 - 2x = 0 \quad K1$ $x = 25 \quad N1$</p> <p>$\frac{d^2A}{dx^2} = -2 \quad N1$</p> <p>(ii) $\theta = \frac{100 - 2(25)}{25} \quad K1$ $\theta = 2 \quad N1$</p>	8
8	(a)	$\left[\frac{mx^2}{2} + Cx \right]_0^4 = 16 \quad K1$ $y = mx + c \text{ Gunakan koordinat/use coordinate } (4, 6) \quad K1$ $6 = m(4) + C \quad K1$ <p>Selesaikan menggunakan kaedah persamaan serentak $m = 1$ dan $c = 2 \quad N1 \quad N1$</p>	
	(b)	<p>Luas Berlorek = Luas trapezium + Luas Di bawah Lengkung <i>Shaded area = Area of trapezium + Area under curve</i></p> $= \frac{1}{2}(6+2)(4) \quad K1 \quad \text{OR} \quad \left[\frac{(x-6)^3}{3(1)} \right]_4^6 \quad K1$ $= 16 + \frac{8}{3} \quad K1$ $= 18\frac{2}{3} @ \frac{56}{3} @ 18.667 \quad N1$	10
	(c)	<p>Jumlah isipadu = Isipadu janaan oleh garis lurus + Isipadu janaan oleh lengkung <i>Total Volume = Volume generated straight line + Volume generated curve</i></p> <p>Use limit</p> $\pi \left[\frac{(x+2)^3}{3(1)} \right]_0^4 \quad K1$ <p>OR</p> $\pi \left[\frac{(x-6)^5}{5(1)} \right]_4^6 \quad K1$ $\frac{208}{3}\pi + \frac{32}{5}\pi$ $75\frac{11}{15} @ \frac{1136}{15} @ 75.733 \quad N1$	

9	(a)	$G = \left(\frac{8(1)+2(2)}{3}, \frac{7(1)+1(2)}{3} \right)$ $G = (4,3)$	<p>K1</p> <p>N1</p>
	(b)	$m_{RG} = \frac{5-3}{-2-4} = -\frac{1}{3}$ $m_{PQ} = 3$ $y-7 = 3(x-8)$ $y = 3x-17$	<p>P1</p> <p>K1</p> <p>N1</p>
	(c)	$m = \frac{5-1}{-2-2} = -1$ $y-5 = -1(x+2)$ $y = -x+3$	<p>K1</p> <p>N1</p>
	(d)	<p>(a) $2PW = 3PR$</p> $2\sqrt{(x-8)^2 + (y-7)^2} = 3\sqrt{(x+2)^2 + (y-5)^2}$ $5x^2 + 5y^2 + 100x - 34y - 191 = 0$	<p>P1</p> <p>K1</p> <p>N1</p>

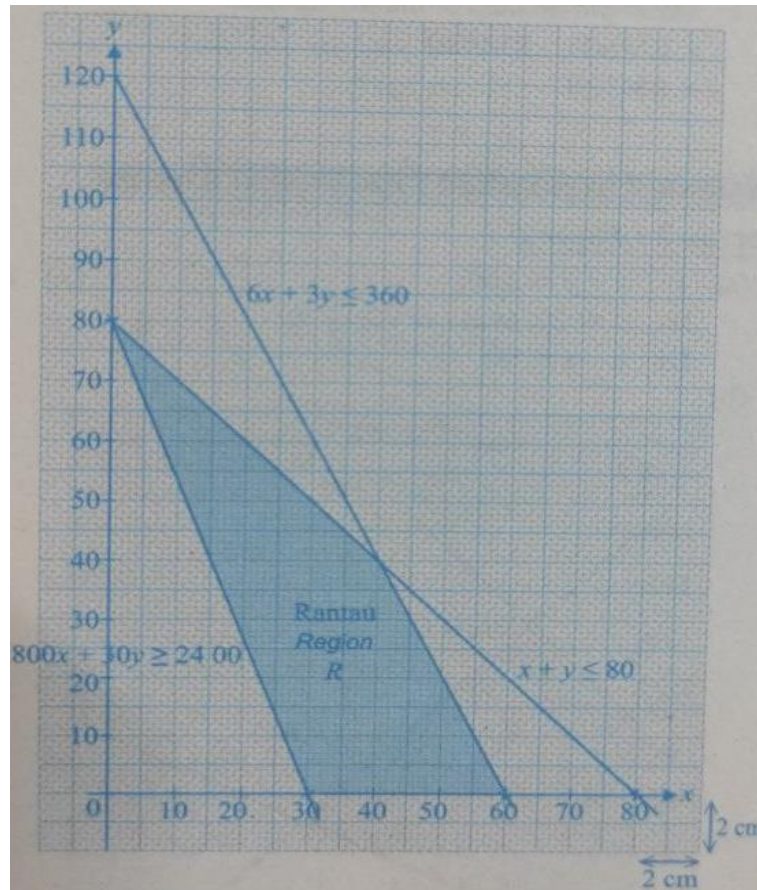
10

10	(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">$\frac{1}{x}$</td> <td style="text-align: center;">0.67</td> <td style="text-align: center;">0.50</td> <td style="text-align: center;">0.33</td> <td style="text-align: center;">0.25</td> <td style="text-align: center;">0.20</td> <td style="text-align: center;">0.17</td> </tr> <tr> <td style="text-align: center;">$\frac{1}{y}$</td> <td style="text-align: center;">0.50</td> <td style="text-align: center;">1.30</td> <td style="text-align: center;">2.15</td> <td style="text-align: center;">2.60</td> <td style="text-align: center;">2.85</td> <td style="text-align: center;">2.95</td> </tr> </table> <p style="text-align: center;">K1 K1</p>	$\frac{1}{x}$	0.67	0.50	0.33	0.25	0.20	0.17	$\frac{1}{y}$	0.50	1.30	2.15	2.60	2.85	2.95	
$\frac{1}{x}$	0.67	0.50	0.33	0.25	0.20	0.17											
$\frac{1}{y}$	0.50	1.30	2.15	2.60	2.85	2.95											
	(b)	<p style="text-align: center;">P1 K1 K1</p>	10														
	(c)	<p>(c) $\frac{1}{y} = \frac{p}{n} \left(\frac{1}{x}\right) + \frac{1}{n}$ K1</p> <p style="margin-left: 40px;">i) $\frac{1}{n} = 3.87$ K1 $n = 0.260$ N1</p> <p style="margin-left: 40px;">ii) $\frac{p}{n} = -\frac{2.85}{0.57}$ K1 $p = -1.3$ N1</p>															

11	(a)(i)	$(i) P(X = 6) = {}^6C_6(p)^6(1-p)^0 = 0.04666$ $p^6 = 0.04666$ $6 \log_{10} p = \log_{10} 0.04666$ $\log_{10} p = \frac{\log_{10} 0.04666}{6}$ $p = 0.6$	K1 K1 N1	10
	(a)(ii)	$P(X > 4) = P(X = 5) + P(X = 6)$ $= {}^6C_5(0.6)^5(0.4)^1 + {}^6C_6(0.6)^6(0.4)^0$ $= 0.23328$	K1 N1	
	(b)(i)	$(i) P(X > V) = 0.409$ $P\left(z > \frac{V-900}{17}\right) = 0.409$ $\frac{V-900}{17} = 0.23$ $V = 903.91$	K1 N1	
	(b)(ii)	$P(866 < X < 951)$ $= P\left(\frac{866-900}{17} < z < \frac{951-900}{17}\right)$ $= P(-2 < z < 3) = 1 - P(z < -2) - P(z > 3)$ $= 0.9759$	K1 K1 N1	
12	(a)	$\frac{1}{2}(6)(10)\sin \angle ACB = 22$ $\angle ACB = 180^\circ - 47.17^\circ$ 132.83°	K1 N1	10
	(b)	$AB^2 = 6^2 + 10^2 - 2(6)(10)\cos^*132.83$ 14.75 cm	K1 N1	
	(c)	$\frac{\sin \angle BCD}{8} = \frac{\sin 40^\circ}{6}$ $\angle BCD = 180^\circ - 58.99$ $121.01^\circ (\text{obtuse})$ $\angle DBC = 180^\circ - 40^\circ - 121.01^\circ = 18.99^\circ$ $\frac{\sin \angle CBA}{10} = \frac{\sin 132.83^\circ}{*14.75}$ $\angle CBA = 29.82^\circ$ $\angle DBA = 29.82^\circ + 18.99^\circ = 48.81^\circ$	K1 K1 K1 N1	
	(d)	$\frac{1}{2}(8)(14.75)\sin 48.81^\circ$ 44.40 cm^2	K1 N1	

13	(a)	2 % P1	
	(b)	$123 = \frac{P_{18}}{10.50} \times 100$ $RM12.92$ K1 N1	
	(c)	$\frac{92}{100} = \frac{x}{125}$ $x = 115$ K1 K1 N1	10
	(d)	$I_{18/14} = \frac{62.15}{55.00} \times 100$ $I_{18/14} = 113$ $\frac{98(y+2) + 123(y+4) + 115(5)}{y+2+y+4+5} = 113$ $y = 4$ K1 N1 K1 N1	
14	(a)	<p>(a) Tiga ketaksamaan;</p> $6x + 3y \leq 360$ $800x + 300y \geq 24000$ $x + y \leq 80$ N1 N1 N1	

(b)



K1 K1 K1

10

(c)

(b) Berdasarkan graf;

(i) 35 N1

(ii) Titik maks (40,40) N1

$k = RM 700(40) + RM 250(40)$ K1

$k = RM 38000$ N1

15	(a)	$25m + 5n = 0$ atau $5m + n = 0$ P1 $a = 2mt + n$ K1 $2m + n = 3$ K1 $m = -1$ N1	10	
	(b)	$(-t^2 + 5t) > 0$ K1 $0 < t < 5$ N1		
	(c)	$s = -\frac{t^3}{3} - \frac{5t^2}{2}$ K1 $\left(\frac{2^3}{3} + \frac{5(2)^2}{2}\right) - \left(-\frac{1^3}{3} + \frac{5(1)^2}{2}\right)$ K1 K1 $5\frac{1}{6}$ N1		