

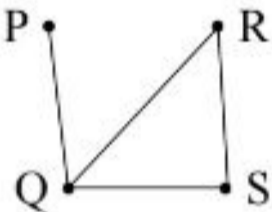
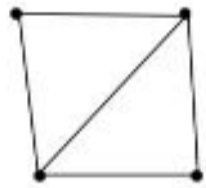
**UJIAN GEMPUR MATEMATIK SPM 2022 JPN PERAK**  
**PERATURAN PEMARKAHAN**

**Kertas 1**

<b>Bil</b>	<b>Jawapan</b>	<b>Bil</b>	<b>Jawapan</b>	<b>Bil</b>	<b>Jawapan</b>	<b>Bil</b>	<b>Jawapan</b>
1	<b>B</b>	11	<b>C</b>	21	<b>B</b>	31	<b>A</b>
2	<b>A</b>	12	<b>B</b>	22	<b>B</b>	32	<b>D</b>
3	<b>B</b>	13	<b>C</b>	23	<b>B</b>	33	<b>A</b>
4	<b>B</b>	14	<b>C</b>	24	<b>A</b>	34	<b>C</b>
5	<b>D</b>	15	<b>D</b>	25	<b>C</b>	35	<b>C</b>
6	<b>C</b>	16	<b>C</b>	26	<b>B</b>	36	<b>A</b>
7	<b>D</b>	17	<b>A</b>	27	<b>D</b>	37	<b>B</b>
8	<b>D</b>	18	<b>C</b>	28	<b>C</b>	38	<b>A</b>
9	<b>C</b>	19	<b>C</b>	29	<b>B</b>	39	<b>D</b>
10	<b>A</b>	20	<b>C</b>	30	<b>C</b>	40	<b>B</b>

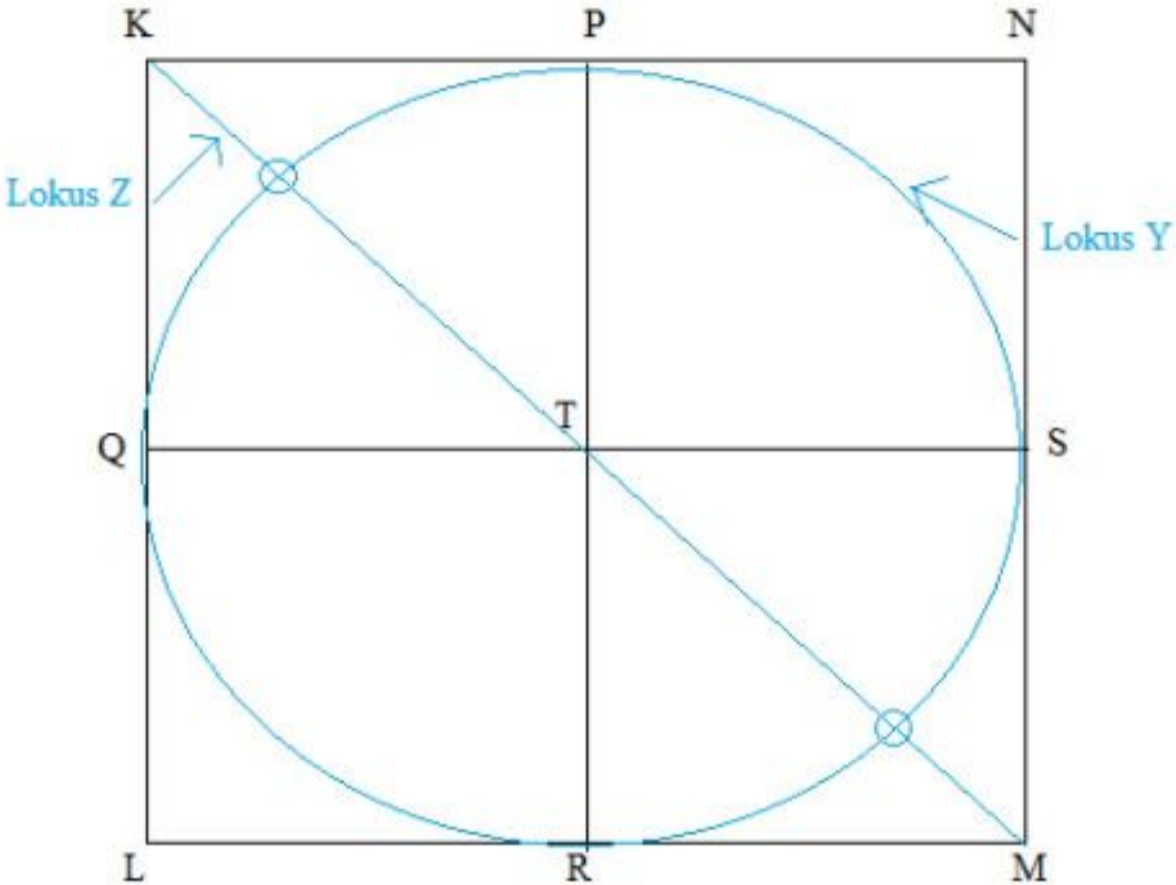
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## Bahagian A

Bil	Jawapan	Markah
1.	<p>Katakan harga satu rim kertas A4 dan satu rim kertas A3 masing-masing ialah RMx dan RMy.</p> <p><i>Let the prices of a ream of A4 paper and a ream of A3 paper are RMx and RMy respectively.</i></p> $\begin{bmatrix} 3 & 2 \\ 2 & 5 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 42 \\ 61 \end{bmatrix}$ $\begin{bmatrix} x \\ y \end{bmatrix} = \frac{1}{15 - 4} \begin{bmatrix} 5 & -2 \\ -2 & 3 \end{bmatrix} \begin{bmatrix} 42 \\ 61 \end{bmatrix}$ $= \frac{1}{11} \begin{bmatrix} 88 \\ 99 \end{bmatrix}$ $= \begin{bmatrix} 8 \\ 9 \end{bmatrix}$ <p><math>x = 8</math></p> <p><math>y = 9</math></p> <p>harga satu rim kertas A4 ialah RM8</p> <p>harga satu rim kertas A3 ialah RM9.</p>	<p>P1</p> <p>K1</p> <p>N1</p> <p>N1</p>
		4
2.	<p>(a)</p>  <p>atau setara</p> <p>Semua betul</p> <p>Nota :</p> <p>1. Ada 4 bucu dan sekurang-kurangnya 3 tepi betul</p>	<p>K2</p> <p>[K1]</p>
	<p>(b)</p>  <p>Semua betul</p>	<p>K2</p>
		4

3.	$\frac{RM100000}{RM1000} \times RM 2.80$ $\frac{RM80000}{RM1000} \times RM 2.64$ <p>Beza = RM280 - RM211.20 = RM68.80</p>	<p>K1</p> <p>K1</p> <p>K1</p> <p>N1</p>
		4

4	<p>a) Laju = <math>\frac{80}{(50 \div 60)}</math> = 96 kmj<sup>-1</sup></p>	<p>K1</p> <p>N1</p>
	<p>b) Laju (pulang) = <math>\frac{80}{(40 \div 60)}</math> = 120 kmj<sup>-1</sup> Beza Laju = 120 kmj<sup>-1</sup> - 96 kmj<sup>-1</sup> = 24 kmj<sup>-1</sup></p>	<p>K1</p> <p>N1</p>
		4

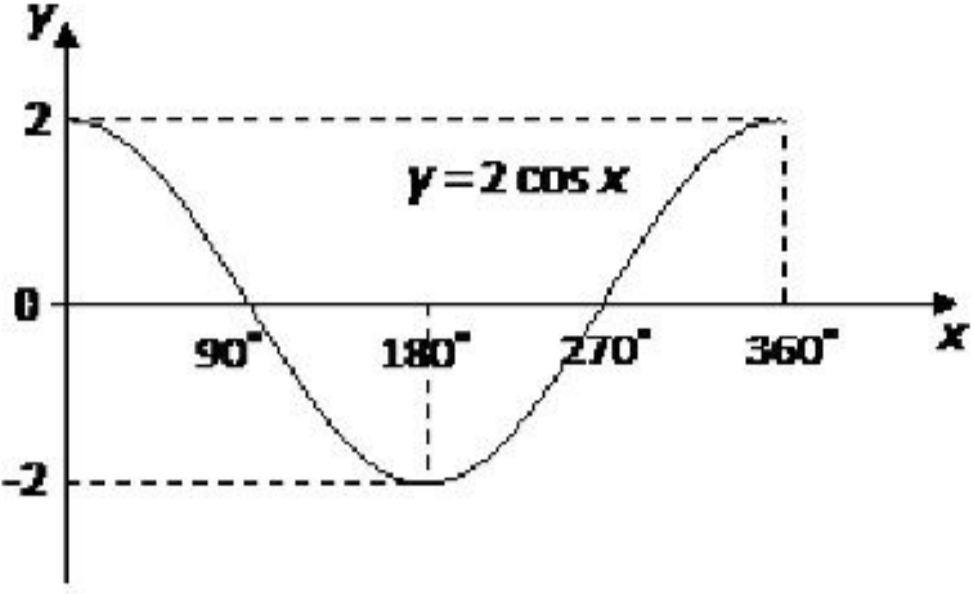
5.	a)    Garis lurus PR	P1
	<p>b)</p> 	<p>Lokus Y P1 Lokus Z P1 Persilangan P1</p>
		4

6	(a) $= \left( \frac{90}{100} \times 95000 \right)$ $= 85\,500$	K1 N1
	b)    Ansuran bulanan $85\,500 + \left[ \left( \frac{90}{100} \times 95000 \right) \times \frac{2.8}{100} \times 9 \right]$ $\frac{107\,046}{9 \times 12}$ RM 991.17	K1 K1 N1
		5

7	$(2 \times 4^2 + 1 \times 4^0) + (1 \times 2^4 + 1 \times 2^1 + 1 \times 2^0) + (3 \times 5^2)$ 127 tahun	K1 K1  N1
		3

8	(a) (i) Sebilangan / Some	P1
	(ii) Semua / All	P1
	(b) (i) Benar / True	P1
	(ii) Palsu / False	P1
		4

9	a) $\left[ \frac{1}{2} \times 6 \times (4 + v) \right] = 2 \left( \frac{1}{2} \times 4 \times v \right)$ $v = 12$	K1 K1 N1
	(b) $\frac{12 - 4}{6 - 0}$ $\frac{4}{3}$ atau 1.333	K1 N1
		5

10	<p>a)</p>  <p><math>y = 2 \cos x</math></p> <p>Bentuk graf kos <i>Shape cos graph</i></p> <p>Maks=2, Min =-2 (Amplitud) <i>Max = 2, Min = -2 (Amplitude)</i></p>	K1
	b) -2	P1
		3

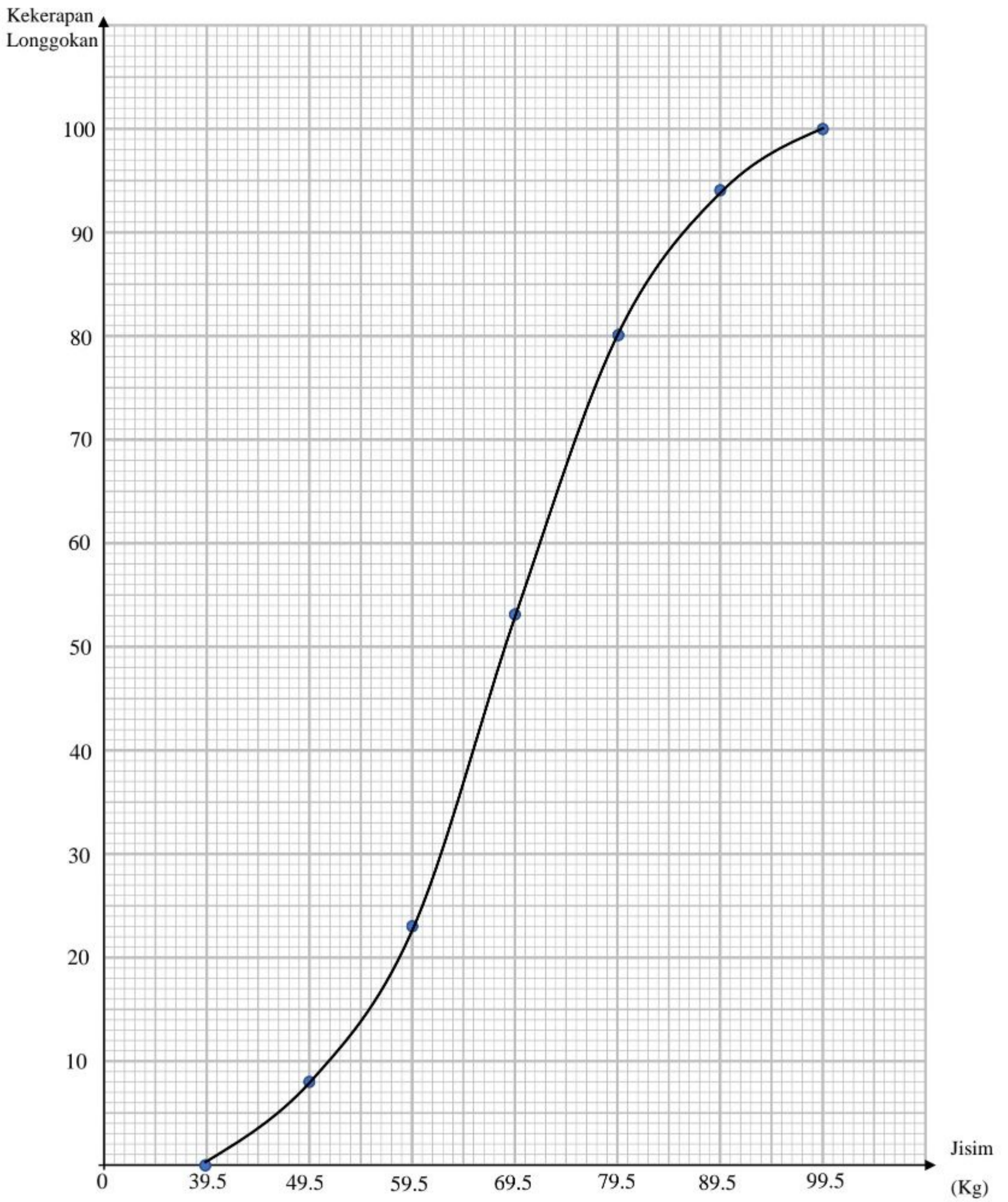
## Bahagian B

11	a)	(i) 2 (ii) 6 (iii) -1	P1 P1 P1
	b)	$a(x - 2)(x - 6) = 0$ $-x^2 + 8x - 12 = 0$	P2
	c)	$-\frac{8}{2(-1)}$ $x = 4$	K1 N1
	d)	$-(4)^2 + 8(4) - 12$ (4, 4)	P1
			8

12	a)	<table border="1"> <thead> <tr> <th>Jisim (kg) / Mass (kg)</th> <th>Kekerapan / Frequency</th> <th>Titik tengah / Midpoint</th> <th>Sempadan atas / Upper boundary</th> <th>Kekerapan longgokan / Cumulative Frequency</th> </tr> </thead> <tbody> <tr> <td>30 – 39</td> <td>0</td> <td>34.5</td> <td>39.5</td> <td>0</td> </tr> <tr> <td>40 – 49</td> <td>8</td> <td>44.5</td> <td>49.5</td> <td>8</td> </tr> <tr> <td>50 – 59</td> <td>15</td> <td>54.5</td> <td>59.5</td> <td>23</td> </tr> <tr> <td>60 – 69</td> <td>30</td> <td>64.5</td> <td>69.5</td> <td>53</td> </tr> <tr> <td>70 – 79</td> <td>27</td> <td>74.5</td> <td>79.5</td> <td>80</td> </tr> <tr> <td>80 – 89</td> <td>14</td> <td>84.5</td> <td>89.5</td> <td>94</td> </tr> <tr> <td>90 – 99</td> <td>6</td> <td>94.5</td> <td>99.5</td> <td>100</td> </tr> </tbody> </table>	Jisim (kg) / Mass (kg)	Kekerapan / Frequency	Titik tengah / Midpoint	Sempadan atas / Upper boundary	Kekerapan longgokan / Cumulative Frequency	30 – 39	0	34.5	39.5	0	40 – 49	8	44.5	49.5	8	50 – 59	15	54.5	59.5	23	60 – 69	30	64.5	69.5	53	70 – 79	27	74.5	79.5	80	80 – 89	14	84.5	89.5	94	90 – 99	6	94.5	99.5	100	<p>Sempadan Atas Baris 2 – 7 betul P1</p> <p>Kekerapan Longgokan Baris 2 – 7 betul P1</p>
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$\Sigma fx^2 = 488605$	K1
<p>Varians / Variance</p> $= \frac{488605}{100} - 68.7^2$ $= 4886.05 - 4719.69$ $= 166.36$	K1
<p>Sisihan piawai / Standard deviation</p> $= \sqrt{166.36}$ $= 12.8981$	K1
<p>C) Rujuk graf</p> <p>Paksi dilukis pada arah yang betul, skala seragam bagi <math>39.5 \leq x \leq 99.5</math> dan <math>0 \leq y \leq 100</math>.</p> <p>7 titiknya* ditanda dengan betul</p> <p>Lengkungan licin melalui 7 titik yang betul</p>	N1
	P1
	K2
	N1
	<b>10</b>





13	a) i. $S = \{(Aziz, Samuel), (Aziz, Kishen), (Aziz, Nabila), (Aziz, Batrisyia), (Samuel, Kishen), (Samuel, Nabila), (Samuel, Batrisyia), (Kishen, Nabila), (Kishen, Batrisyia), (Nabila, Batrisyia)\}$  ii. $\frac{6}{10} = \frac{3}{5}$	P2  K1N1
	b) i. $S = \{(Aziz, Nabila), (Aziz, Batrisyia), (Aziz, Christine), (Aziz, Varsha), (Samuel, Nabila), (Samuel, Batrisyia), (Samuel, Christine), (Samuel, Varsha), (Kishen, Nabila), (Kishen, Batrisyia), (Kishen, Christine), (Kishen, Varsha), (Elyas, Nabila), (Elyas, Batrisyia), (Elyas, Christine), (Elyas, Varsha), (Jie Wei, Nabila), (Jie Wei, Batrisyia), (Jie Wei, Christine), (Jie Wei, Varsha)\}$  ii. $\frac{4}{20} = \frac{1}{5}$	P2  K1N1
		<b>8</b>

14	a) 7880 – 3370 – 1820 2690 Lebih tunai	K1 N1 N1
	b) 300000/2500 atau 120 120/12 10	P1 K1 N1

	<p>c) Meningkatkan jumlah lebih tunai setiap bulan daripada RM 2690 kepada RM 2780</p> $500000 / (15 \times 12)$ $2777.78$ <p>Nota : Terima jawapan yang munasabah berdasarkan bab 10.</p>	<p>P1 K1 N1</p>
		<b>9</b>

15	<p>(a)</p> <p>(i) Pembesaran pada pusat (-10, -2) dengan faktor skala 2.</p> <p>(ii) Pembesaran pada pusat (-2, 2) dengan faktor skala -2.</p>	<p>P3 P3</p>
	<p>(b)</p> <p>(i) <math>J // (6, 6)</math></p> <p>(ii) <math>2^2</math></p> $2^2 \times 12.5$ $50$	<p>P1 K2 N1</p>
		<b>10</b>

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## Bahagian C

16	a) i) Putaran 150° ikut arah jam pada pusat O Rotation of 90° clockwise at centre O ii) $2 \times 3.142 \times 8 \times \frac{210^\circ}{360^\circ}$ $= 29.33 \text{ m}$	P3 K1 K1 N1
	b) i) $x + y = 7$ $4x + 12y = 52$  ii) Kaedah Penggantian $x = 7 - y$ K1 $4(7 - y) + 12y = 52$ $8y = 24$ K1  <b>atau</b>  Kaedah Penghapusan $4x + 4y = 28$ K1 $-8y = -24$ K1  Bilangan kanak-kanak = 4 Bilangan dewasa = 3	P1 P1       N1 N1
	c) $MV = 9500 \left(1 + \frac{0.05}{4}\right)^{4(2)}$  $MV = \text{RM } 10492.62$	K2  N1
		<b>15</b>

17	<p>a. Fitri = F, Aliyah = A</p> <p>i. <math>F = (2x - 5)(x + 2)</math>  <math>= 2x^2 + 4x - 5x - 10</math>  <math>= 2x^2 - x - 10</math></p> <p>ii. <math>F = 2(10)^2 - 10 - 10</math>  <math>F = \text{RM } 180</math></p>	K1 N1 K1 N1
	<p>b. Min Fitri atau / or Aliyah  <math>= \frac{40+70+90+85+64}{5}</math> atau / or <math>\frac{80+65+73+58+73}{5}</math>  <math>= 69.8</math></p> <p>Sisihan Piawai Fitri atau Sisihan Piawai Aliyah  <i>Standard Deviation Fitri atau Standard Deviation Aliyah</i></p> $\sqrt{\frac{40^2+70^2+90^2+85^2+64^2}{5} - 69.8^2}$ atau / or $\sqrt{\frac{80^2+65^2+73^2+58^2+73^2}{5} - 69.8^2}$ $= 17.67$ dan / and $7.574$ <p>Aliyah layak untuk menerima Anugerah Pekerja Cemerlang kerana sisihan piawai Aliyah lebih rendah menunjukkan prestasi Aliyah lebih konsisten.  <i>Aliyah is eligible to receive the Outstanding Employee Award because Aliyah's lower standard deviation shows that Aliyah's work performance is more consistent.</i></p>	K1 N1 K1 N1N1 N1
	<p>c. Pendapatan bercukai / <i>Chargeable Income</i>  <math>= \text{RM } 53\,700 - \text{RM } 400 - (\text{RM } 9\,000 - \text{RM } 7\,000 - \text{RM } 2\,700 - \text{RM } 4\,500)</math>  <math>= \text{RM } 30\,100</math></p> <p>Cukai pendapatan yang perlu dibayar / <i>Income tax payable</i>  <math>(\text{RM } 30\,100 - \text{RM } 20\,000) \times 3\%</math></p> $= \text{RM } 150 + [(\text{RM } 30\,100 - \text{RM } 20\,000) \times 3\%] - \text{RM } 400$ ( Rebat / <i>Rebate</i> ) $= \text{RM } 150 + \text{RM } 303 - \text{RM } 400$ $= \text{RM } 53$	K1 N1 K1 K1 N1
		15