

KERTAS MODEL SPM

MATEMATIK

Dwibahasa

KERTAS MODEL SIJIL PELAJARAN MALAYSIA SET 1

KERTAS 1

1 B

$$\begin{aligned} 36 \times \left(\frac{1}{\sqrt[3]{343}}\right)^{-1} &= 36 \times \left(\frac{1}{7}\right)^{-1} \\ &= 36(7) \\ &= 252 \end{aligned}$$

2 A

$$\begin{aligned} 434_6 &: \\ (6^2 \times 4) + (6^1 \times 3) + (6^0 \times 4) &= 144 + 18 + 4 \\ &= 166_{10} \end{aligned}$$

$$\begin{array}{r} 9 \overline{) 166} \\ 9 \overline{) 18} \quad - 4 \\ 9 \overline{) 2} \quad - 0 \\ 0 \quad - 2 \end{array}$$

$$204_9, m = 0$$

3 D

$$\begin{aligned} \frac{(3rs^{-4})^4 \times (s^4)^{-3}}{r^7 s^{-27}} &= \frac{(3^4 r^4 s^{-16}) \times s^{-12}}{r^7 s^{-27}} \\ &= 81r^{(4-7)}s^{[-16+(-12)-(-27)]} \\ &= 81r^{-3}s^{-1} \\ &= \frac{81}{r^3s} \end{aligned}$$

4 B

$$\begin{aligned} J: 202_4 &= (4^2 \times 2) + (4^1 \times 0) + (4^0 \times 2) \\ &= 32 + 0 + 2 \\ &= 34 \end{aligned}$$

$$\begin{aligned} K: 111_5 &= (5^2 \times 1) + (5^1 \times 1) + (5^0 \times 1) \\ &= 25 + 5 + 1 \\ &= 31 \end{aligned}$$

$$L: 53_6 = (6^1 \times 5) + (6^0 \times 3)$$

$$= 30 + 3$$

$$= 33$$

$$M: 40_8 = (8^1 \times 4) + (8^0 \times 0)$$

$$= 32 + 0$$

$$= 32$$

∴ Kapal *K* mengambil masa terpendek. / *Ship K takes the shortest time.*

5 A

$$1001_3 = (3^3 \times 1) + (3^2 \times 0) + (3^1 \times 0) + (3^0 \times 1)$$

$$= 27 + 0 + 0 + 1$$

$$= 28$$

$$54_6 = (6^1 \times 5) + (6^0 \times 4)$$

$$= 30 + 4$$

$$= 34$$

$$28 < n_{10} < 34, \therefore n = 33$$

6 C

Hartanah mempunyai tahap kecairan terendah.
Real estate has the lowest liquidity level.

7 C

$$MV = P \left(1 + \frac{r}{n} \right)^{nt}$$

$$P = \text{RM}25\,000, \quad r = 0.033, \quad n = 3, \quad t = 1$$

$$MV = 25\,000 \left(1 + \frac{0.033}{3} \right)^{3(1)}$$

$$= 25\,000(1.033364331)$$

$$= \text{RM}25\,834.11$$

8 D

$$V = (0.85 \times 100 \text{ cm}) \times (0.26 \times 100 \text{ cm}) \times 30 \text{ cm}$$

$$= 85 \times 26 \times 30$$

$$= 66\,300 \text{ cm}^3$$

$$= 6.63 \times 10^4 \text{ cm}^3$$

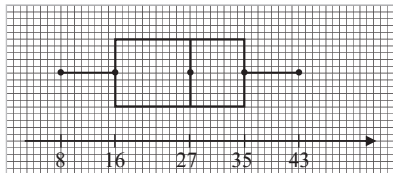
9 C

8, 11, 16, 22, 25, 29, 32, 35, 39, 43

$$Q_1 = \frac{1}{4} \times 10 = 2.5 \rightarrow 16$$

$$m = \frac{1}{2} = 5 \rightarrow 27$$

$$Q_3 = \frac{3}{4} \times 10 = 7.5 \rightarrow 35$$



Q_3 ialah 35 bukan 32. / Q_3 is 35 not 32.

10 C

$$\begin{aligned}\text{Skala / Scale} &= \frac{20 \text{ cm}}{(20 \times 100\,000) \text{ cm}} \\ &= \frac{20 \text{ cm}}{200\,000 \text{ cm}} \\ &= 1 : 100\,000\end{aligned}$$

11 B

$$\begin{aligned}3q + 2p &= 15 \\ 3q &= 15 - 2p \\ q &= \frac{15 - 2p}{3}\end{aligned}$$

12 C

$$\begin{aligned}\text{Sudut pedalaman / Interior angle} &= \frac{(5 - 2) \times 180^\circ}{5} \\ &= 108^\circ\end{aligned}$$

$$f = 108^\circ$$

$$\begin{aligned}g &= 180^\circ - 108^\circ \\ &= 72^\circ\end{aligned}$$

$$e = 108^\circ$$

$$\begin{aligned}e + f + g &= 108^\circ + 108^\circ + 72^\circ \\ &= 288^\circ\end{aligned}$$

13 B

$$\begin{bmatrix} 2 & -4 \\ 5 & -3 \end{bmatrix} \begin{bmatrix} -1 & 0 \\ 7 & -6 \end{bmatrix}$$

$$= \begin{bmatrix} (2 \times -1) + (-4 \times 7) & (2 \times 0) + (-4 \times -6) \\ (5 \times -1) + (-3 \times 7) & (5 \times 0) + (-3 \times -6) \end{bmatrix}$$

$$= \begin{bmatrix} -30 & 24 \\ -26 & 18 \end{bmatrix}$$

$$a_{21} = -26$$

14 A

Kadar inflasi, kadar faedah dan kesihatan diri ialah aspek yang perlu diambil kira bagi pelan kewangan jangka panjang.

Inflation rate, interest rate and personal health are aspects that need to be taken into account for a long-term financial plan.

15 D

$$y > -2x + 4$$

$$\begin{array}{ll} 1 > -2(1) + 4 & , \quad 0 > -2(2) + 4 \\ 1 > 2 & \quad 0 > 0 \end{array}$$

$$\begin{array}{ll} 2 > -2(1) + 4 & , \quad 2 > -2(2) + 4 \\ 2 > 2 & \quad 2 > 0 \end{array}$$

(2, 2) berada di rantau $y > -2x + 4$.

(2, 2) is in the region of $y > -2x + 4$.

16 C

$$G \propto \frac{1}{H^2}$$

17 B

Bucu Vertex	Darjah Degrees
P	2
Q	4
R	4
S	2

$$\begin{aligned}\text{Bilangan darjah / Number of degree} &= 2 + 4 + 4 + 2 \\ &= 12\end{aligned}$$

18 D

$$\begin{aligned}3(x+1)(x-1) - 8x &= 0 \\ 3(x^2 - x + x - 1) - 8x &= 0 \\ 3(x^2 - 1) - 8x &= 0 \\ 3x^2 - 3 - 8x &= 0 \\ 3x^2 - 8x - 3 &= 0 \\ (x-3)(3x+1) &= 0 \\ x = 3 \text{ atau / or } x &= -\frac{1}{3}\end{aligned}$$

19 B

$$\begin{aligned}\text{Harga 1 unit mainan pada bulan Januari} &= \text{RM}400 \div 200 \\ \text{Price of 1 unit toy in January} & \\ &= \text{RM}2\end{aligned}$$

$$\begin{aligned}\text{Harga 1 unit mainan pada bulan Februari} &= \text{RM}500 \div 250 \\ \text{Price of 1 unit toy in February} & \\ &= \text{RM}2\end{aligned}$$

Harga seunit mainan ialah RM2 pada kedua-dua bulan Januari dan Februari.
The price of one unit is RM2 for both months, January and Februari.

20 A

$$\begin{aligned}k &= \frac{PA'}{PA} \\ &= \frac{9 \text{ cm}}{27 \text{ cm}} \\ &= \frac{1}{3}\end{aligned}$$

21 B

$$\begin{aligned}\text{Sisihan piawai / Standard deviation} &= \sqrt{\frac{\sum x^2}{N} - \bar{x}^2} \\ &= \sqrt{\frac{396}{7} - \left(\frac{52}{7}\right)^2} \\ &= \sqrt{\frac{68}{49}} \\ &= 1.18\end{aligned}$$

22 D

$$\xi = \{20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45\}$$

$$R = \{24, 30, 36, 42\}$$

$$S = \{27, 36, 45\}$$

$$(R \cap S) = \{36\}$$

$$n(\xi) = 26$$

$$n(R) = 4$$

$$n(S) = 3$$

$$n(R \cap S) = 1$$

$$n(R \cup S)' = 26 - 6 \\ = 20$$

23 A

$$m_{EF} = -\frac{3}{4}$$

$$m_{GH} = \frac{5}{3}$$

$$m_{EF} \times m_{GH} = -\frac{3}{4} \times \frac{5}{3} \\ = -\frac{5}{4}$$

24 C

$$m = -\frac{J}{K} = -\frac{7}{6}$$

$$K = (6, 0)$$

$$\therefore x = 6$$

25 B

Isi padu prisma = luas keratan rentas \times tinggi

Volume of prism = cross-sectional area \times height

$$= \frac{1}{2} \times \sqrt{17^2 - 15^2} \times 15 \text{ cm} \times 20 \text{ cm}$$

$$= 1\,200 \text{ cm}^3$$

26 D

$$\frac{1}{3} \begin{pmatrix} -9 & 3 \\ 9 & 6 \end{pmatrix} - 2P = \begin{pmatrix} -1 & 5 \\ 1 & -2 \end{pmatrix}$$

$$\begin{pmatrix} -3 & 1 \\ 3 & 2 \end{pmatrix} - 2P = \begin{pmatrix} -1 & 5 \\ 1 & -2 \end{pmatrix}$$

$$-2P = \begin{pmatrix} -1 & 5 \\ 1 & -2 \end{pmatrix} - \begin{pmatrix} -3 & 1 \\ 3 & 2 \end{pmatrix}$$

$$-2P = \begin{pmatrix} 2 & 4 \\ -2 & -4 \end{pmatrix}$$

$$P = \begin{pmatrix} -1 & -2 \\ 1 & 2 \end{pmatrix}$$

27 A

$$5JM = 2ML$$

$$JM = \frac{2}{5}ML$$

$$JM = \frac{2}{5}(20 \text{ cm})$$

$$JM = 8 \text{ cm}$$

$$KJ = \sqrt{10^2 - 8^2}$$
$$= 6 \text{ cm}$$

$$\cos / \cos x = \frac{6}{10}, \quad \tan y = -\frac{6}{8}$$

$$\cos / \cos x + \tan y = \frac{6}{10} + \left(-\frac{6}{8}\right)$$
$$= \frac{24}{40} - \frac{30}{40}$$
$$= -\frac{3}{20}$$

28 C

$$f(x) = -x^2 + 4x + c$$

$$-x^2 + 4x + 21 = 0$$

$$x^2 - 4x - 21 = 0$$

$$(x - 7)(x + 3) = 0$$

$$x = 7 \text{ atau / or } x = -3$$

$$\therefore r = -3, s = 7$$

29 C

$$2q, 3q, (4q), 4q, 5q, 6q, 6q, 6q, (10q), 10q, 11q, 12q$$

$$Q_1 = \frac{1}{4} \times 12 = 3 \rightarrow 4q$$

$$Q_3 = \frac{3}{4} \times 12 = 9 \rightarrow 10q$$

$$Q_3 - Q_1 = 6q$$

30 B

Dadu / Dice	Pen / Pens	Kad / Cards
3	6	$y + 2$

$$\frac{5}{6} = \frac{y + 2}{3 + 6 + (y + 2)}$$

$$6(y + 2) = 5(y + 11)$$

$$6y + 12 = 5y + 55$$

$$6y - 5y = 55 - 12$$

$$y = 43$$

Bilangan baharu dadu baharu / *New number of dice* = $3 + 4 = 7$

Bilangan baharu pen / *New number of pen* = $6 + 5 = 11$

Bilangan baharu kad / *New number of card* = $45 - 1 = 44$

Dadu / Dice	Pen / Pens	Kad / Cards
7	11	44

$$\begin{aligned} \text{Kebarangkalian baharu / New probability} &= \frac{44}{7 + 11 + 44} \\ &= \frac{44}{62} \\ &= \frac{22}{31} \end{aligned}$$

31 C

$$\begin{aligned} 36^{2y+3} &= 216^{4y-6} \\ (6^2)^{2y+3} &= (6^3)^{4y-6} \\ 6^{4y+6} &= 6^{12y-18} \\ 4y+6 &= 12y-18 \\ 4y-12y &= -18-6 \\ -8y &= -24 \\ y &= \frac{-24}{-8} \\ y &= 3 \end{aligned}$$

32 B

- A:** $3^4 = 12$ atau $(-4)^2 = 16$. (palsu **atau** benar \rightarrow benar)
 $3^4 = 12$ or $(-4)^2 = 16$. (*false or true \rightarrow true*)
- B:** $4x^2 + 8x^2 = 12x^2$ dan 6 ialah faktor bagi 116. (benar **dan** palsu \rightarrow palsu)
 $4x^2 + 8x^2 = 12x^2$ and 6 is a factor of 116. (*true and false \rightarrow false*)
- C:** $\{ \} \subset \{2, 5, 7\}$ atau $15 \notin \{\text{Gandaan bagi } 5\}$. (benar **atau** palsu \rightarrow benar)
 $\{ \} \subset \{2, 5, 7\}$ or $15 \notin \{\text{Multiple of } 5\}$. (*true or false \rightarrow true*)
- D:** 343 ialah nombor kuasa tiga sempurna dan $(c+d)(c-d) = c^2 - d^2$. (benar **dan** benar \rightarrow benar)
343 is a perfect cube number and $(c+d)(c-d) = c^2 - d^2$. (*true and true \rightarrow true*)

33 D

$$\begin{aligned} \text{Set } S &= 33 + x + x \\ 53 &= 33 + 2x \\ 2x &= 20 \\ x &= \frac{20}{2} \\ x &= 10 \end{aligned}$$

$$\begin{aligned} \text{Bilangan murid yang menyukai satu permainan sahaja} &= 4 + x + 33 + x \\ \text{Number of students who only like one type of game} &= 4 + 10 + 33 + 10 \\ &= 57 \end{aligned}$$

34 A

$$\begin{aligned} \text{Sudut penumpang yang menggunakan motosikal} &= \frac{15}{100} \times 360^\circ \\ \text{Angle of passengers use motorcycles} &= 54^\circ \end{aligned}$$

$$\begin{aligned} \text{Sudut penumpang yang menggunakan bas} &= 360^\circ - 160^\circ - 100^\circ - 54^\circ \\ \text{Angle of passengers use buses} &= 46^\circ \end{aligned}$$

$$\begin{aligned} \text{Bilangan penumpang yang menggunakan bas} &= \frac{46^\circ}{360^\circ} \times 900 \\ \text{Number of passengers use buses} &= 115 \end{aligned}$$

35 D

Warna hijau mempunyai kekerapan tertinggi.
Green colour has the highest frequency.

36 C

$$y = -\cos / \cos x$$

$$y = -\cos / \cos x$$

$$0 = -\cos / \cos \theta$$

$$0 = -\cos / \cos 270^\circ$$

$$\therefore \theta = 270^\circ$$

37 B

Kelas Bijaksana menunjukkan pencapaian paling konsisten kerana mempunyai sisihan piawai terkecil.
Class Bijaksana shows the most consistent achievement because it has the smallest standard deviation.

38 B

$$(200 \times 0.218 + 100 \times 0.334 + 300 \times 0.516 + (y) \times 0.546 + \left(\frac{6}{100} \times y \times 0.546\right) = 318.61$$

$$231.80 + 0.546y + 0.03276y = 318.61$$

$$0.57876y = 86.81$$

$$y = 149.99$$

$$y \approx 150$$

39 A

Kos rawatan / *Treatment cost* = RM30 000

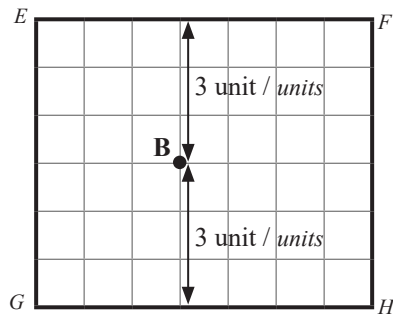
Jumlah yang perlu ditanggung Siew Mei / *Amount borne by Siew Mei* = RM20 000

Jumlah yang perlu dibayar oleh syarikat insurans = RM30 000 – RM20 000

Amount need to pay by the insurance company

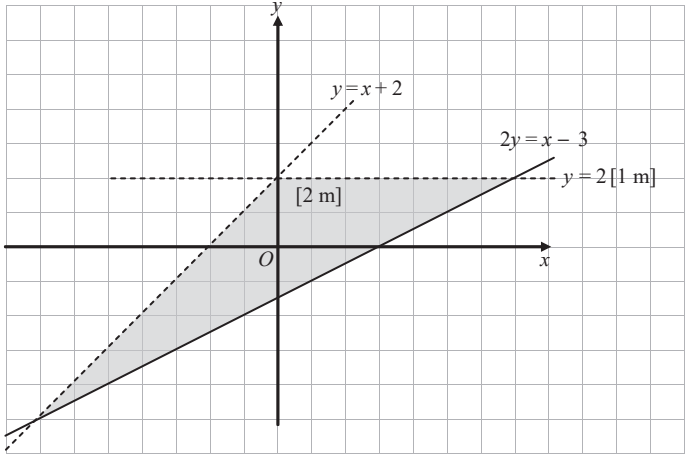
$$= \text{RM}10\,000$$

40 B



KERTAS 2

Bahagian A

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
1	(a) $\left(\frac{-6+4}{2}, \frac{-1+5}{2}\right)$ $= (-1, 2)$	1	4
	(b) $\sqrt{(-1-4)^2 + (2-5)^2}$ $= 5.83$	1	
2	$(3x+4)(2x+1) = 209$ $6x^2 + 11x + 4 = 209$ $6x^2 + 11x - 205 = 0$ $(x-5)(6x+41) = 0$ $x = 5$ atau / or $x = -\frac{41}{6}$ $\therefore x = 5$	1	4
3		3	3
4	(a) Sfera tidak mempunyai bucu atau isi padu sfera ialah $V = \frac{4}{3} \pi r^3$. <i>A sphere does not have vertices or the volume of a sphere is $V = \frac{4}{3} \pi r^3$.</i> Benar. <i>True.</i>	1	4
	(b) 72 ialah gandaan 8. <i>72 is a multiple of 8.</i> Deduktif. <i>Deductive.</i>	1	
5	(a) $\frac{4}{7} \times \frac{3}{6}$ $= \frac{2}{7}$	1	4
	(b) $\left(\frac{4}{7} \times \frac{3}{6}\right) + \left(\frac{3}{7} \times \frac{4}{6}\right)$ $= \frac{4}{7}$	1	

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
6	(a)	2	
	(b) $x = 2$ Koordinat titik minimum = $(2, -3)$ The coordinates of minimum point = $(2, -3)$	1 1	4
7	$PR = \sqrt{29^2 - 21^2}$ $= 20$ $PQ = \sqrt{20^2 - 16^2}$ $= 12$ $\tan y = -\frac{16}{12}$ $= -\frac{4}{3}$	1 1 1	3
8	(a) Jumlah perlindungan untuk penyakit kritikal <i>Total coverage for critical illness</i> $\frac{25}{100} \times \text{RM}200\,000$ $= \text{RM}50\,000$ Premium tahunan penyakit kritikal <i>Annual critical illness premium</i> $\frac{\text{RM}50\,000}{\text{RM}1\,000} \times \text{RM}1.05$ $= \text{RM}52.50$	1 1	
	(b) $\frac{\text{RM}200\,000}{\text{RM}1\,000} \times \text{RM}1.23 + \text{RM}52.50$ $= \text{RM}298.50$	2 1	5
9	(a) $17\,000 \times 15 \times 7 \times 4$ $= 7\,140\,000$ $= 7.14 \times 10^6$	2 1	
	(b) $\frac{90}{100} \times 7.14 \times 10^6$ $= 6.426 \times 10^6$	1 1	5
10	$P \propto \frac{Q}{R}$ $P = \frac{kQ}{R}$ $30 = \frac{k(10)}{2}$ $k = 6$ $Q = \frac{6(15)}{5}$ $Q = \text{RM}18$	1 1 1 1	4

Bahagian B

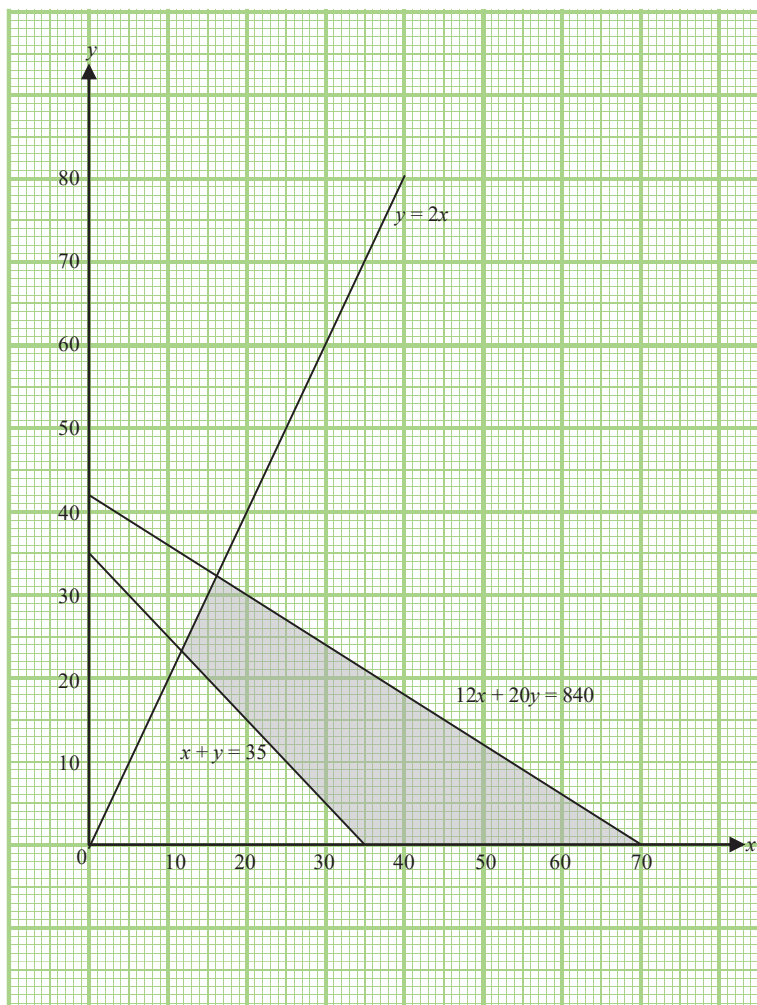
No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
11	(a) $(10, -2) \xrightarrow{Q} (4, -4) \xrightarrow{P} (-4, 4)$	2	10
	(b) (i) Putaran ikut arah jam pada pusat $(-2, -4)$. <i>Clockwise rotation at the centre of $(-2, -4)$.</i>	3	
	(ii) Pembesaran dengan faktor skala 3 pada pusat $(-2, -1)$. <i>Enlargement with the scale factor of 3 at the centre of $(-2, -1)$.</i>	3	
	(c) Luas imej = $k^2 \times$ luas objek <i>Area of image = $k^2 \times$ area of object</i> $= 3^2 \times 54$ $= 486 \text{ cm}^2$	1 1	
12	(a) $6(-5) - 3(-5q) = 0$ $q = 2$	2 1	8
	(b) Biar $x =$ ikan, $y =$ sotong <i>Let $x =$ fish, $y =$ squid</i> $4x + 9y = 326$ $3x + 8y = 277$ $\begin{pmatrix} 4 & 9 \\ 3 & 8 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 326 \\ 277 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{4(8) - 9(3)} \begin{pmatrix} 8 & -9 \\ -3 & 4 \end{pmatrix} \begin{pmatrix} 326 \\ 277 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{5} \begin{pmatrix} 8 & -9 \\ -3 & 4 \end{pmatrix} \begin{pmatrix} 326 \\ 277 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} \frac{8}{5} & -\frac{9}{5} \\ -\frac{3}{5} & \frac{4}{5} \end{pmatrix} \begin{pmatrix} 326 \\ 277 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 23 \\ 26 \end{pmatrix}$ $x = 23$ $y = 26$	1 1 1 1 1 1 1	
13	(a) $x + y \geq 35$ $y \leq 2x$ $12x + 20y \leq 840$	1 1 1	
	(b) <ul style="list-style-type: none"> • Kedua-dua paksi adalah betul. <i>Both axes are correct.</i> • $x + y = 35$ dilukis dengan betul. <i>$x + y = 35$ is drawn correctly.</i> • $y = 2x$ dilukis dengan betul. <i>$y = 2x$ is drawn correctly.</i> • $12x + 20y = 840$ dilukis dengan betul. <i>$12x + 20y = 840$ is drawn correctly.</i> • Rantau dilorek dengan betul. <i>The region is shaded correctly.</i> 	1 1 1 1 1	

No.

Skema Pemarkahan
Marking Scheme

Markah
Marks

Markah Total
Total Marks



8

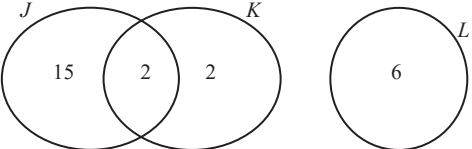
14 (a)

Sempadan atas <i>Upper boundary</i>	Kekerapan longgokan <i>Cumulative frequency</i>
59.5	0
64.5	4
69.5	19
74.5	37
79.5	58
84.5	72
89.5	78
94.5	80

2

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
(b)	Jumlah cukai pintu = kadar cukai pintu × nilai tahunan <i>Total of assessment tax = assessment tax rate × annual leave</i> $= 5\% \times \text{RM}7\,690$ $= \text{RM}384.50$ Cukai pintu setiap setengah tahun = $\text{RM}384.50 \div 2$ <i>Assessment tax each half year</i> $= \text{RM}192.25$	1 1 1	10
(c)	$\text{RM}250 \times 2 + (\text{RM}250 \times 2 \times 6\%)$ $= \text{RM}530$	2 1	

Bahagian C

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
16	(a) (i) $(4x - 6)(x + 3) = 220$ $4x^2 + 12x - 6x - 18 = 220$ $4x^2 + 6x - 238 = 0$ $(x - 7)(2x + 17) = 0$ $x = 7$ atau / or $x = -\frac{17}{2}$ $\therefore x = 7$ (ii) $2[4(7) - 6] + 2(7 + 3)$ $= 64 \text{ cm}$	1 1 1 1 1	15
(b)	$\frac{70}{100} \times \frac{22}{7} \times 28^2 \times 50$ $= 86\,240 \text{ cm}^3$	2 1	
(c)	(i) 16 (ii) $\frac{320}{240}$ $= 13.33 \text{ m s}^{-1}$	1 1 1	
(d)	(i) $y = 10 \sin 2x$ (ii) $10 - (-10)$ $= 20$	2 1 1	
17	(a) (i) $-\frac{40}{\left(\frac{5}{60}\right)}$ $= 480 \text{ km j}^{-2} / \text{km h}^{-2}$ (ii) $\frac{1}{2} (v + 40) \left(\frac{20}{60}\right) + \left(\frac{6}{60} \times 40\right) = 12$ $v = 8 \text{ km j}^{-1} / \text{km h}^{-1}$	1 1 2 1	15
(b)		3	

4 C

$$348 \times 438 = 152\,424 \text{ m}^2$$

152 424 = 152 000 m² (tiga angka bererti / *three significant figures*)

5 A

$$\frac{u}{3+u+7} \times 360^\circ = 120^\circ$$

$$\frac{u}{u+10} = \frac{120^\circ}{360^\circ}$$

$$\frac{u}{u+10} = \frac{1}{3}$$

$$3u = u + 10$$

$$3u - u = 10$$

$$2u = 10$$

$$u = 5$$

6 D

A: $\angle e + \angle p = 180^\circ$ adalah benar.

$\angle e + \angle p = 180^\circ$ is true.

B: $\angle p + \angle q + \angle r = 180^\circ$ adalah benar.

$\angle p + \angle q + \angle r = 180^\circ$ is true.

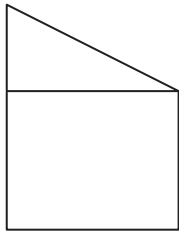
C: $\angle e + \angle f + \angle g = 360^\circ$ adalah benar.

$\angle e + \angle f + \angle g = 360^\circ$ is true.

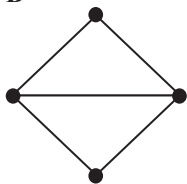
D: $\angle f = \angle p + \angle q$ adalah tidak benar. $\angle f = \angle p + \angle r$ adalah benar.

$\angle f = \angle p + \angle q$ is not true. $\angle f = \angle p + \angle r$ is true.

7 B



8 B



bukan subgraf
not a subgraph.

9 A

$$2 \times \frac{22}{7} \times 16 \times 4 = 402.29 \text{ cm}^2$$

10 D

Bentuk S dan T tidak mempunyai ruang apabila berlaku teselasi.
S and T shapes do not have space when tessellation happens.

11 A

$$\begin{aligned}\text{Faktor skala} &= \frac{45}{9} \\ \text{Scale factor} &= 5\end{aligned}$$

12 A

FSTB / HCF

5	$25x^3, 5x^3$
x	$5x^3, x^2$
x	$5x^2, x$

$$5x, 1$$

$$5 \times x \times x = 5x^2$$

13 D

$$A = P + Prt$$

$$522.50 \times 8 \times 12 = 38\,000 + 38\,000(r)(8)$$

$$50\,160 = 38\,000 + 304\,000r$$

$$12\,160 = 304\,000r$$

$$r = \frac{12\,160}{304\,000}$$

$$r = 0.04$$

$$r = 4\%$$

14 C

Bentuk graf ialah U, $a > 0$.

The graph shape is U, $a > 0$.

$$y = x^2 - 3, y = 0^2 - 3$$

$$y = -3$$

$$y = x^2 - 9, y = 0^2 - 9$$

$$y = -9$$

$$\therefore y = x^2 - 9$$

15 B

$$\frac{24p - 12pq}{p^2 - 36} \div \frac{6p^2q}{p + 6}$$

$$= \frac{12p(2 - q)}{(p + 6)(p - 6)} \times \frac{p + 6}{6p^2q}$$

$$= \frac{2(2 - q)}{pq(p - 6)}$$

16 B

$\cos x = -\frac{1}{\sqrt{2}}$, $180^\circ \leq x \leq 360^\circ$, $\cos x$ berada di sukuan III.

$\cos x = -\frac{1}{\sqrt{2}}$, $180^\circ \leq x \leq 360^\circ$, $\cos x$ is in quadrant III.

$\sin x = -\frac{1}{\sqrt{2}}$ jika berada di sukuan III.

$\sin x = -\frac{1}{\sqrt{2}}$ if it is in quadrant III.

$$6 \sin x = -\frac{6}{\sqrt{2}}$$

17 A

$$\tan 40^\circ = \frac{16}{FG}$$

$$FG = \frac{16}{\tan 40^\circ}$$

$$FG = 19.07 \text{ m}$$

18 C

$$u = \frac{5}{6} \sqrt{\frac{v}{w}}$$

$$\frac{6u}{5} = \sqrt{\frac{v}{w}}$$

$$\left(\frac{6u}{5}\right)^2 = \left(\sqrt{\frac{v}{w}}\right)^2$$

$$\frac{36u^2}{25} = \frac{v}{w}$$

$$w = \frac{25v}{36u^2}$$

19 B

$$\frac{5}{2} q \leq 20$$

$$q \leq \frac{40}{5}$$

$$q \leq 8$$

$$4q + 5 > 29$$

$$4q > 24$$

$$q > \frac{24}{4}$$

$$q > 6$$

$$q = 7, 8$$

20 A

Domain = {3, 5, 7}

Julat = {9, 11, 12}

Range

21 D

Biarkan jumlah empat nombor = T

Let the total of four numbers = T

$$\frac{T}{4} = 15$$

$$T = 15 \times 4$$

$$T = 60$$

$$\frac{T + x + x + 2}{4 + 2} = 25$$

$$T + 2x + 2 = 25 \times 6$$

$$60 + 2x + 2 = 150$$

$$2x = 150 - 62$$

$$2x = 88$$

$$x = 44$$

22 C

$$\text{Luas sukuan} = \frac{1}{4} \times \pi r^2$$

$$\text{Area of quadrant} = \frac{1}{4} \times \pi r^2$$

$$= \frac{1}{4} \times \frac{22}{7} \times 7^2$$

$$= \frac{77}{2} \text{ cm}^2$$

$$\text{Luas segi tiga} = \frac{1}{2} \times (10 + 7) \times (7 + 4)$$

$$\text{Area of triangle} = \frac{187}{2} \text{ cm}^2$$

$$\text{Luas kawasan berlorek} = \frac{187}{2} - \frac{77}{2}$$

$$\text{Area of shaded region} = 55 \text{ cm}^2$$

23 A

Andaikan / *Let,*

Farhan = f

Wahid = w

Zurina = z

$$f = 6w$$

Andaikan / *Let,* $w = m$

$$f = 6w$$

$$f = 6m$$

$$f + w = 6m + m$$

$$= 7m$$

$$z = f + 17$$

$$= 6m + 17$$

24 C

A:	Segi empat selari <i>Parallelogram</i>	0
B:	Rombus <i>Rhombus</i>	2
C:	Trapezium	0
D:	Layang-layang <i>Kite</i>	1

25 B

$$\begin{aligned} & \left(\frac{-9 + 5}{2}, \frac{8 + 14}{2} \right) \\ &= \left(\frac{-4}{2}, \frac{22}{2} \right) \\ &= (-2, 11) \end{aligned}$$

26 B

Pilihan jenama adalah bukan kuantiti.
Choices of brands are not quantities.

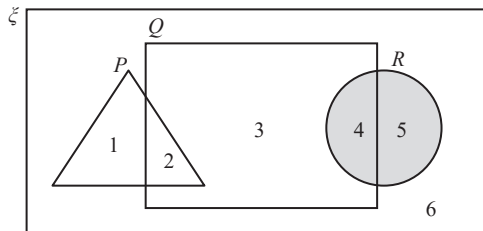
27 C

$$\begin{aligned} \angle EGO &= \frac{180^\circ - 140^\circ}{2} \\ &= 20^\circ \\ \angle KGE &= 90^\circ - 20^\circ \\ &= 70^\circ \\ \angle KGE &= \angle GEF \\ \angle GEF &= 70^\circ \\ y &= 70^\circ \end{aligned}$$

28 B

$$\begin{aligned} G &= \{48, 54, 60, 66, 72, 78\} \\ n(G) &= 6 \end{aligned}$$

29 D



$$P = 1, 2$$

$$P' = 3, 4, 5, 6$$

$$Q = 2, 3, 4$$

$$R = 4, 5$$

$$\begin{aligned} P' \cup Q &= 3, 4, 5, 6 \cup 2, 3, 4 \\ &= 2, 3, 4, 5, 6 \end{aligned}$$

$$\begin{aligned} P' \cup Q \cap R &= 2, 3, 4, 5, 6 \cup 4, 5 \\ &= 4, 5 \end{aligned}$$

$$\{29, 30, 31, 32, 33\}$$

30 A

$$\begin{aligned}\text{Bilangan darjah} &= 6 \times 2 \\ \text{Number of degrees} & \\ &= 12\end{aligned}$$

31 D

$$\begin{aligned}2, 2, 3, 4, 5, 6, 7, 7, 8, 9, \underline{10}, 10, 11, 12 \\ 10 - 4 = 6\end{aligned}$$

32 C

$$\text{RM1 } 800 - \text{RM1 } 300 = \text{RM500}$$

33 B

$$\begin{aligned}\tan \theta &= \frac{0.75}{(-0.62)} \\ &= -1.21\end{aligned}$$

34 B

$$\begin{aligned}y &= mx + c \\ 0 &= \frac{3}{4}x + 6 \\ -6 &= \frac{3}{4}x \\ x &= \frac{-6 \times 4}{3} \\ x &= -8\end{aligned}$$

35 A

$$\frac{55}{250} = \frac{11}{50}$$

36 D

$$\text{RM11 } 000 \times \frac{7}{100} \times \frac{1}{2} = \text{RM385}$$

37 A

$$\begin{aligned}e &\propto f^3 \\ e &= kf^3 \\ -25.6 &= k(4)^3 \\ k &= -0.4 \\ -86.4 &= (-0.4)f^3 \\ f^3 &= 216 \\ f &= \sqrt[3]{216} \\ f &= 6\end{aligned}$$

38 D

$$\begin{aligned}\begin{pmatrix} -2 \\ 4 \end{pmatrix} \begin{pmatrix} 6 & 3 \end{pmatrix} &= \begin{pmatrix} -2 \times 6 & -2 \times 3 \\ 4 \times 6 & 4 \times 3 \end{pmatrix} \\ &= \begin{pmatrix} -12 & -6 \\ 24 & 12 \end{pmatrix}\end{aligned}$$

39 D

$$p - 3(7) = 8$$

$$p - 21 = 8$$

$$p = 8 + 21$$

$$p = 29$$

$$7 - 3q = 4$$

$$-3q = 4 - 7$$

$$-3q = -3$$

$$q = \frac{-3}{-3}$$

$$q = 1$$

40 C

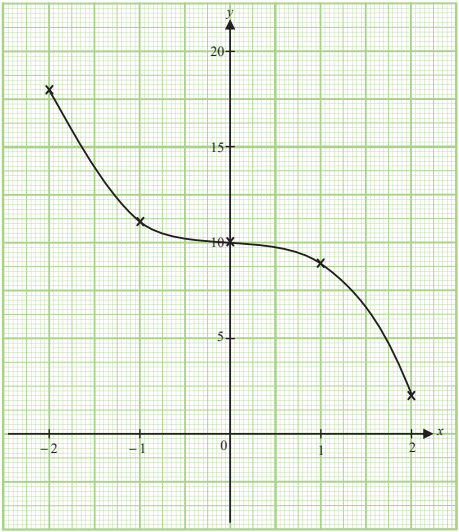
$$\frac{(42 \times 2) + (47 \times 7) + (52 \times 16) + (57 \times 19) + (62 \times 9) + (67 \times 4) + (72 \times 3)}{60}$$

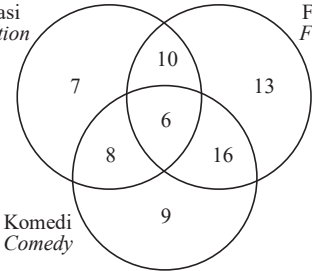
$$= \frac{3\,370}{60}$$

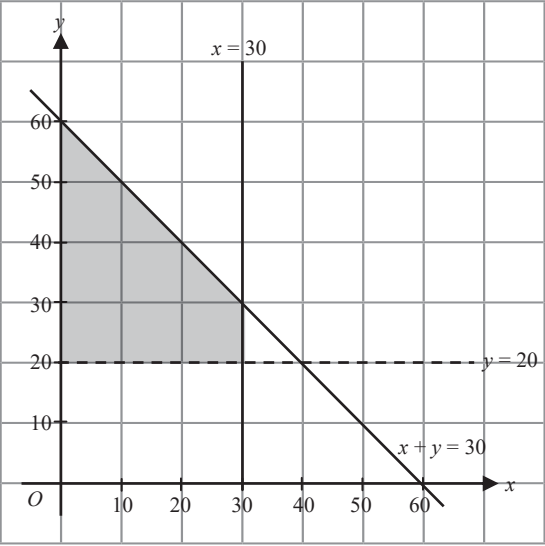
$$= 56.17$$

KERTAS 2

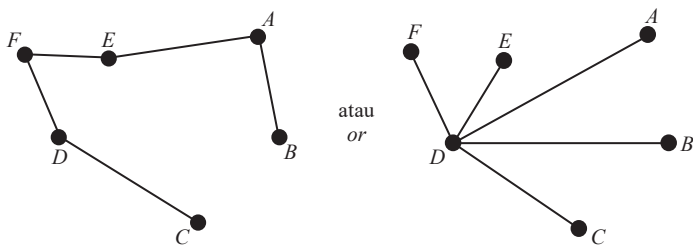
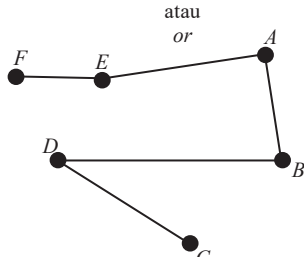
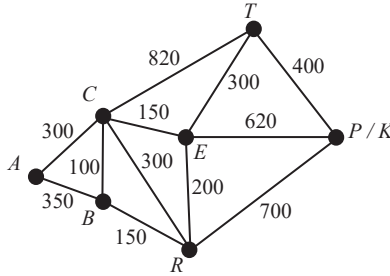
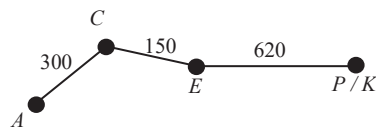
Bahagian A

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks												
1	(a) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>y</td> <td>18</td> <td>11</td> <td>10</td> <td>9</td> <td>2</td> </tr> </table>	x	-2	-1	0	1	2	y	18	11	10	9	2	1	
	x	-2	-1	0	1	2									
y	18	11	10	9	2										
(b) 	2	3													
2	$m = \frac{3 - 0}{0 - 6}$ $= -\frac{1}{2}$ $0 = -\frac{1}{2}(0) + c$ $c = 0$ $y = -\frac{1}{2}x$	1 1 1	3												

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
3	(a) $\text{Min / Mean} = \frac{34 + 37 + 41 + 44 + 46 + 48 + 50 + 63 + 64 + 67 + 67 + 69 + 71}{13}$ $= 53.92$	1	3
	(b) $\frac{11}{13} \times 100\% = 84.62\%$ Murid kelas tersebut mencapai peratusan lulus sebanyak 84.62%. <i>Pupils in the class achieved a passing percentage of 84.62%.</i>	1	
4	(a) 	2	5
	(b) (i) $7 + 13 + 9 = 29$ (ii) $7 + 8 + 13 + 16 + 9 = 53$	1 1 1	
5	(a) <i>EFGH</i> mempunyai 4 paksi simetri. <i>EFGH has 4 axes of symmetry.</i>	1	5
	(b) (i) $y = 230x + 10$ (ii) $2\ 080 = 230x + 10$ $2\ 070 = 230x$ $x = 9$ bulan / months	2 1 1	
6	(a) Tidak, kos rawatan adalah sama dengan deduktibel. <i>No, the cost of treatment is equal to the deductible.</i>	1	4
	(b) Kos perubatan selepas deduktibel <i>Medical cost after deductible</i> $= \text{RM}40\ 000 - \text{RM}3\ 000$ $= \text{RM}37\ 000$ Kos yang ditanggung oleh Becky <i>The cost borne by Becky</i> $= \frac{30}{100} \times \text{RM}37\ 000 + \text{RM}3\ 000$ $= \text{RM}14\ 100$	1 1 1	
7	(a) Laju seragam <i>Uniform speed</i>	1	4
	(b) Jumlah jarak $= \frac{1}{2} \times 15 \times 30 + \frac{1}{2} \times (45 - 25) \times 30$ <i>Total distance</i> $= 525$ m	2 1	
8	(a) Tidak. Satu daripada panjang sisi sepadan bentuk tersebut adalah tidak sama. <i>No. One of the corresponding side lengths of the shape is not similar.</i> atau / or Tidak. Satu daripada sudut sepadan bentuk tersebut adalah tidak sama. <i>No. One of the corresponding angles of the shape is not similar.</i>	1	

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
	<p>(b) Pembesaran pada pusat (7, 4) dengan faktor skala $\frac{-2}{3}$. <i>Enlargement at centre (7, 4) with a scale factor of $\frac{-2}{3}$.</i></p>	3	4
9	<p>(a) (i) Pendapatan bercukai <i>Chargeable income</i> $= \text{RM}46\,990 - \text{RM}400 - \text{RM}9\,000 - \text{RM}3\,800 - \text{RM}3\,000$ $= \text{RM}30\,790$</p> <p>(ii) Layak. Rebat cukai sebanyak RM400 akan diberikan kepada pembayar cukai sekiranya pendapatan bercukainya tidak melebihi RM35 000. <i>Eligible. Tax rebate of RM400 will be given to the taxpayers if their taxable income is not exceeding RM35 000.</i></p> <p>(b) Cukai pendapatan <i>Income tax</i> $= \text{RM}150 + (\text{RM}30\,790 - \text{RM}20\,000) \times 3\% - \text{RM}400$ $= \text{RM}73.70$</p>	1 1 1 1 1	5
10	<p>(a) $x + y \leq 60$</p> <p>(b)</p> 	1 3	4

Bahagian B

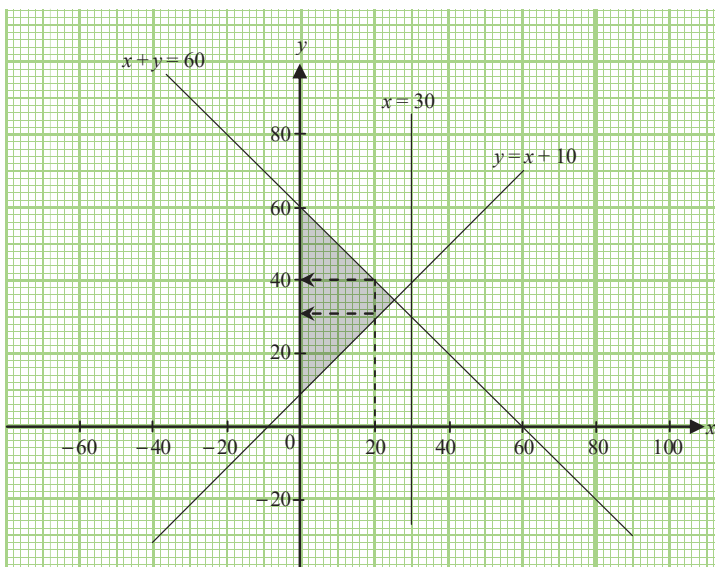
No.	Skema Pemarkahan <i>Marking Scheme</i>	Markah <i>Marks</i>	Markah Total <i>Total Marks</i>
11	<p>(a) (i) $n(E) = 11$ $d = 2 \times 11 = 22$</p> <p>(ii)</p>  <p>atau or</p>  <p>atau or</p>	<p>1</p> <p>1</p> <p>1</p>	
	<p>(b) (i)</p>  <p>(ii)</p>  <p>Jarak terdekat / <i>Shortest distance</i> $= A \rightarrow C \rightarrow E \rightarrow K$ $= 300 + 150 + 620$ $= 1\ 070\ \text{m}$</p>	<p>3</p> <p>1</p> <p>1</p>	
	<p>(c) Tempoh masa diambil / <i>Time taken</i> $= \frac{20}{100} \times 1\ 070$ $= 214\ \text{minit} / \text{minutes}$ $= 3\ \text{jam}\ 34\ \text{minit} / 3\ \text{hours}\ 34\ \text{minutes}$</p> <p>Waktu sampai ke puncak / <i>Time arrive at peak</i> $= 5:00\ \text{a.m.} + 3:34$ $= 8:34\ \text{a.m.}$</p>	<p>1</p> <p>1</p>	<p>10</p>

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
12	(a) Pendapatan tahunan / <i>Annual income</i> = RM5 200 × 12 = RM62 400 Pendapatan bercukai / <i>Chargeable income</i> = 62 400 – 9 000 – 4 000 – 1 800 – 3 800 – 6 000 – 400 = RM37 400	1 1 1	9
	(b) 35 000 pertama / <i>On the first 35 000</i> = RM600 Baki berikutnya / <i>Next balance</i> = RM192 Rebat / <i>Rebate</i> = RM600 Cukai pendapatan / <i>Income tax</i> = 600 + 192 – 600 = RM192	1 1 1	
	(c) 20 × 12 = 240 RM240 – RM192 = RM48 PCB > Cukai pendapatan / <i>Tax income</i> Baki RM48 akan dipulangkan ke akaun Puan Samsiah oleh LHDN. <i>Balance of RM48 will be refunded to Puan Samsiah's account by IRB.</i>	1 1 1	
13	(a) (i) T: Pembesaran pada pusat (–7, 13) dengan faktor skala $-\frac{1}{2}$. <i>Enlargement at centre (–7, 13) with scale factor $-\frac{1}{2}$.</i> (ii) S: Translasi / <i>Translation</i> $\begin{pmatrix} 10 \\ -3 \end{pmatrix}$.	3 2	8
	(b) Anggap luas imej / <i>Let the area of an image</i> = x Luas imej / <i>Area of an image</i> = $\left(-\frac{1}{2}\right)^2 \times$ Luas objek / <i>Area of an object</i> $x = \frac{1}{4} \times (18 + x)$ $4x = 18 + x$ $3x = 18$ $x = 6 \text{ m}^2$ \therefore Luas trapezium IJKL / <i>Area of trapezium IJKL</i> = 6 m^2	1 1 1 1	
14	(a) (i) Koordinat sekolah / <i>School coordinates</i> $= \left(\frac{-2 + 6}{2}, \frac{10 + (-6)}{2}\right)$ $= (2, 2)$ (ii) $\sqrt{(-2 - 3)^2 + (10 - (-4))^2}$ $= 14.87$	1 1 1 1	9
	(b) (i) $m = \frac{10 - (-6)}{-2 - 6}$ $m = -2$ $-2 = \frac{6 - (-4)}{p - 3}$ $p = -2$ (ii) $y = -2x + c, (3, -4)$ $-4 = -2(3) + c$ $c = 2$ $\therefore y = -2x + 2$	1 1 1 1	

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks										
15	(a), (c)	2											
	<table border="1"> <tr> <td>x</td> <td>0°</td> <td>90°</td> <td>180°</td> <td>270°</td> <td>360°</td> </tr> <tr> <td>y</td> <td>-1</td> <td>3</td> <td>-1</td> <td>-5</td> <td>-1</td> </tr> </table> 	x		0°	90°	180°	270°	360°	y	-1	3	-1	-5
x	0°	90°	180°	270°	360°								
y	-1	3	-1	-5	-1								
	(b) (i) 360° (ii) 4 (iii) 3	1 1 1	9										

Bahagian C

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
16	(a) $x + y \leq 60$ $x \leq 30$ $y \geq x + 10$	1 1 1	
	(b) (i)	5	



No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks	
	(b) $\text{Ansurans bulanan / Monthly payment} = \frac{(84\,000) + (84\,000)\left(\frac{4}{100}\right)(5)}{5 \times 12}$ $= \text{RM1 680}$	1 1		
	(c) Kadar asas / Base rate = RM200 Kadar progresif / Progressive rate = $(1\,750 - 1\,600) \times 0.40$ $= \text{RM60}$ Cukai jalan / Road tax = RM200 + RM60 $= \text{RM260}$	1 1		
	(d) Premium asas / Premium rate = RM151.20 $\text{NCD} = \frac{15}{100} \times \text{RM151.20}$ $= \text{RM22.68}$ Premium kasar / Gross premium = $\text{RM151.20} - \text{RM22.68}$ $= \text{RM128.52}$	1 1 1		15

KERTAS 1

1 C

$$9(4) - 6(3) + 8 = 36 - 18 + 8 \\ = 26$$

2 A

Setiap objek dalam domain mempunyai satu imej sahaja.
Each object in the domain has only one image.

3 A

$$\frac{36^x}{216} = \frac{1}{6^x} \\ \frac{6^{2x}}{6^3} = \frac{1}{6^x} \\ 6^{2x-3} = 6^{-x} \\ 2x - 3 = -x \\ 3x = 3 \\ x = 1$$

4 D

$$124_6 \rightarrow 52_{10} \\ 567_8 \rightarrow 375_{10} \\ 52 + 375 = 427 \\ 427_{10} \rightarrow 3202_5$$

5 B

$$P \propto \frac{Q}{R^2} \\ P = \frac{kQ}{R^2} \qquad P = \frac{\frac{4}{3}S}{2^2} \\ 1 = \frac{k(12)}{4^2} \qquad 4(3) = \frac{4}{3}S \\ 16 = 12k \qquad \frac{12(3)}{4} = S \\ k = \frac{4}{3} \qquad S = 9$$

6 C

$$\text{Laju purata / Average speed} = \frac{\text{Jumlah jarak / Total distance}}{\text{Jumlah masa / Total time}} \\ \text{Laju purata / Average speed} = \frac{\left(\frac{1}{2} \times 6 \times 4\right) + \left[\frac{1}{2} \times (6 + 22) \times 4\right] + (22 \times 2)}{10} \\ \text{Laju purata / Average speed} = \frac{112}{10} \\ \text{Laju purata / Average speed} = 11.2 \text{ m s}^{-1}$$

7 B

$$\text{Panjang LK / Length of LK} = \sqrt{13^2 - 12^2} \\ = 5 \text{ cm} \\ \text{Luas / Area} = \left(\frac{1}{2} \times 12 \times 19\right) - \left(\frac{1}{2} \times 5 \times 12\right) \\ = 114 \text{ cm}^2 - 30 \text{ cm}^2 \\ = 84 \text{ cm}^2$$

8 C

$$\begin{aligned} & \frac{(p-4) \times q}{2p \times q} - \frac{(p-2q) \times 2}{pq \times q} \\ &= \frac{pq - 4q - (2p - 4q)}{2pq} \\ &= \frac{pq - 4q - 2p + 4q}{2pq} \\ &= \frac{pq - 2p}{2pq} \end{aligned}$$

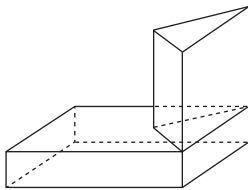
9 D

Jumlah sudut pedalaman / *Sum of interior angles*
 $= (6 - 2) \times 180^\circ$
 $= 720^\circ$
 $x = 720^\circ - 270^\circ - 90^\circ - 43^\circ - 167^\circ - 101^\circ$
 $= 49^\circ$

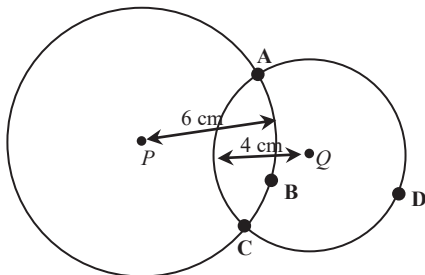
10 A

$$\begin{aligned} \angle EOF &= 180^\circ - 35^\circ - 35^\circ \\ &= 101^\circ \\ \angle EGF &= 110^\circ \div 2 \\ &= 55^\circ \\ \angle EFG &= 180^\circ - (30^\circ + 35^\circ) - 55^\circ \\ &= 60^\circ \\ x &= 60^\circ - 35^\circ \\ &= 25^\circ \end{aligned}$$

11 D



12 B



13 A

$$\begin{aligned} 4x + (0) &= 8 \\ x &= \frac{8}{4} \\ x &= 2 \end{aligned}$$

14 B

$$\begin{aligned} & 3.4 \times 10^{-5} - 0.57 \times 10^{-5} \\ &= 2.83 \times 10^{-5} \end{aligned}$$

15 C

Darjah bagi bucu / Degree of vertex $A = 3$
 Darjah bagi bucu / Degree of vertex $B = 3$
 Darjah bagi bucu / Degree of vertex $C = 4$
 Darjah bagi bucu / Degree of vertex $D = 4$
 Bilangan darjah / Number of degrees $= 3 + 3 + 4 + 4$
 $= 14$

16 C

Kadar pengangguran
 Unemployment rate

17 B

75% daripada premium asas polisi komprehensif adalah kadar premium polisi pihak ketiga, kebakaran dan kecurian.
 75% of the basic premium of comprehensive policy is the premium rate of third party, fire and theft policy from the basic premium.

18 A

Komisen
 Commissions

19 D

$$p\sqrt{q} - 4p = p - 3\sqrt{q}$$

$$p\sqrt{q} + 3\sqrt{q} = p + 4p$$

$$\sqrt{q}(p + 3) = 5p$$

$$\sqrt{q} = \frac{5p}{p + 3}$$

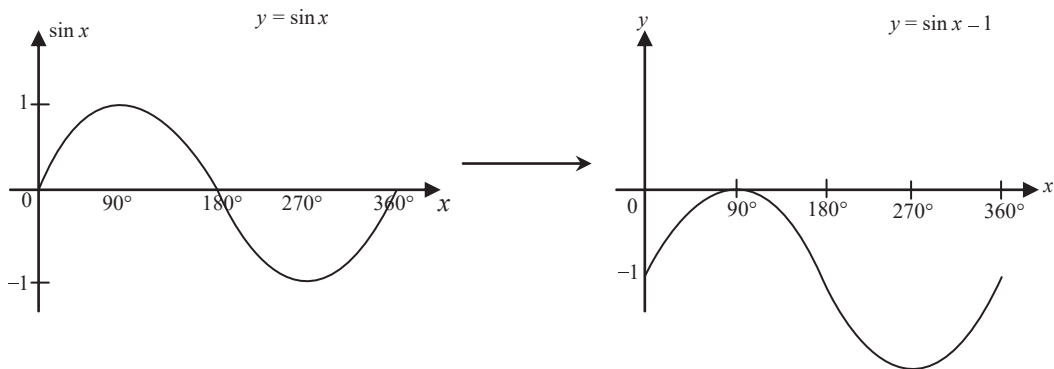
$$\sqrt{q} = \left(\frac{5p}{p + 3}\right)^2$$

20 A

$$n(J \cup K \cap L)' = 5 + 6 + 11 + 9 + 7$$

$$= 38$$

21 C



22 D

Jenis buah Type of fruit	Oren Orange	Epal Apple
Nisbah Ratio	9	: 7
Bilangan buah Number of fruits	$9 \times 3 = 27$	$7 \times 3 = 21$

Bilangan buah oren yang elok / *Number of good oranges*

$$= 27 - 7$$

$$= 20$$

23 B

$$3x^2 - 3x - 18 = 0$$

$$(x - 3)(x + 2) = 0$$

$$x = 3, x = -2$$

24 A

$$\frac{1}{60} = \frac{\text{Ukuran skala / Scale measurement}}{\text{Ukuran sebenar / Actual measurement}}$$

$$\frac{1}{60} = \frac{\text{Ukuran skala / Scale measurement}}{22.2 \text{ m}}$$

$$\frac{1}{60} = \frac{\text{Ukuran skala / Scale measurement}}{22.2 \times 100}$$

$$\text{Ukuran skala / Scale measurement} = \frac{2\,200 \text{ cm}}{60}$$

$$\text{Ukuran skala / Scale measurement} = 37 \text{ cm}$$

25 A

$$\text{Min / Mean} = \frac{(23 \times 2) + (28 \times 8) + (33 \times 18) + (38 \times 26) + (43 \times 30) + (48 \times 10) + (53 \times 4)}{98}$$

$$= \frac{3\,834}{98}$$

$$= 39.12$$

26 D

Nombor perdana / *Prime number* = 2, 3, 5, 7

Nombor kuasa dua sempurna / *Perfect square number* = 9, 16, 25

$$\text{Kebarangkalian / Probability} = \frac{4}{8} + \frac{3}{8}$$

$$= \frac{7}{8}$$

27 D

Rebat cukai / *Tax rebate* = RM400

28 C

$$10 - 8x < x + 28$$

$$10 - 28 < x + 8x$$

$$-18 < 9x$$

$$x < -2$$

$$\therefore x = -1, 0, 1, 2$$

$$x + 28 \leq 40 - 5x$$

$$x + 5x \leq 40 - 28$$

$$6x \leq 12$$

$$x \leq 2$$

29 B

Jika $x + 1 \neq 7$, maka $x \neq 6$

If $x + 1 \neq 7$, then $x \neq 6$

30 D

Julat / *Range* = 1.9 - 1.0

$$= 0.9$$

1.0, 1.1, 1.1, 1.2, 1.2, 1.3, 1.4, 1.5, 1.5, 1.6, 1.7, 1.9

$$Q_1 = \frac{1.1 + 1.2}{2} = 1.15$$

$$Q_3 = \frac{1.5 + 1.6}{2} = 1.55$$

$$\begin{aligned} \text{Julat antara kuartil / Interquartile range} &= 1.55 - 1.15 \\ &= 0.4 \end{aligned}$$

$$\begin{aligned} \text{Beza julat dengan julat antara kuartil / Difference of range and interquartile range} \\ &= 0.9 - 0.4 \\ &= 0.5 \end{aligned}$$

31 C

$$\frac{60}{100} \times 20 = 12$$

Bilangan rantai $\geq y$ cm ialah 12 utas.

The number of the necklaces $\geq y$ cm is 12.

$$\therefore y = 39 \text{ cm}$$

32 B

Jumlah bilangan kek / Total number of cakes = x

$$\frac{90^\circ}{360^\circ} \times x = 165$$

$$x = \frac{165 \times 360}{90}$$

$$x = 660$$

Bilangan kek perisa kopi / Number of coffee flavoured cakes

$$\begin{aligned} &= 660 - 165 - 385 \\ &= 110 \end{aligned}$$

33 A

$$(2 \times -5) + (-2 \times 3x) + (3 \times 4x) = 8$$

$$-10 + (-6x) + 12x = 8$$

$$-10 + 6x = 8$$

$$6x = 18$$

$$x = 3$$

34 D

Kadar perubahan laju / Rate of change of speed

$$= \frac{3 - 15}{7 - 0}$$

$$= -\frac{12}{7}$$

35 B

Titik tengah / Midpoint

$$= \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left(\frac{4 + 2}{2}, \frac{6 + (-2)}{2} \right)$$

$$= (3, 2)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{7 - 2}{-5 - 3}$$

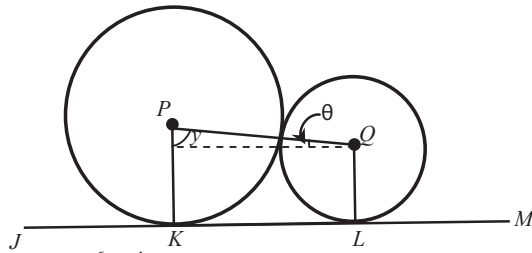
$$= -\frac{5}{8}$$

36 C

Jumlah wang simpanan / *Total savings*

$$\begin{aligned} &= \text{RM}9\,000 + \left(\frac{4}{100} \times 9\,000\right) \\ &= \text{RM}9\,000 + 360 \\ &= \text{RM}9\,360 \end{aligned}$$

37 D



$$\sin \theta = \frac{6-4}{6+4}$$

$$\sin \theta = \frac{2}{10}$$

$$\theta = 11.54^\circ$$

$$\begin{aligned} y &= 180^\circ - 90^\circ - 11.54^\circ \\ &= 78.46^\circ \end{aligned}$$

38 A

Isi padu hemisfera / *Volume of hemisphere*

$$\begin{aligned} &= \frac{1}{2} \times \frac{4}{3} \pi r^3 \\ &= \frac{2}{3} \pi r^3 \\ &= \frac{2}{3} \times \frac{22}{7} \times 3^3 \\ &= 56\frac{4}{7} \text{ cm}^3 \end{aligned}$$

Isi padu kon / *Volume of cone*

$$\begin{aligned} &= \frac{1}{3} \pi r^2 h \\ &= \frac{1}{3} \times \frac{22}{7} \times 3^2 \times 4 \\ &= 37\frac{5}{7} \text{ cm}^3 \end{aligned}$$

Isi padu bekas / *Volume of the container*

$$\begin{aligned} &= 56\frac{4}{7} \text{ cm}^3 + 37\frac{5}{7} \text{ cm}^3 \\ &= 94\frac{2}{7} \text{ cm}^3 \end{aligned}$$

Jumlah isi padu 20 000 bekas / *Volume of 20 000 containers*

$$\begin{aligned} &= 20\,000 \times 94\frac{2}{7} \text{ cm}^3 \\ &= 1\,885\,714.286 \text{ cm}^3 \\ &= \frac{1\,885\,714.286}{1\,000} \times 1 \text{ l} \\ &= 1\,885.714286 \\ &= 1\,885\frac{5}{7} \text{ l} \end{aligned}$$

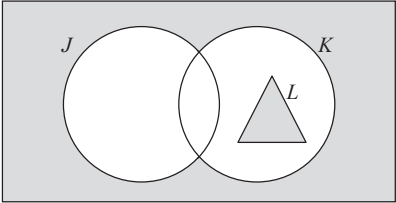
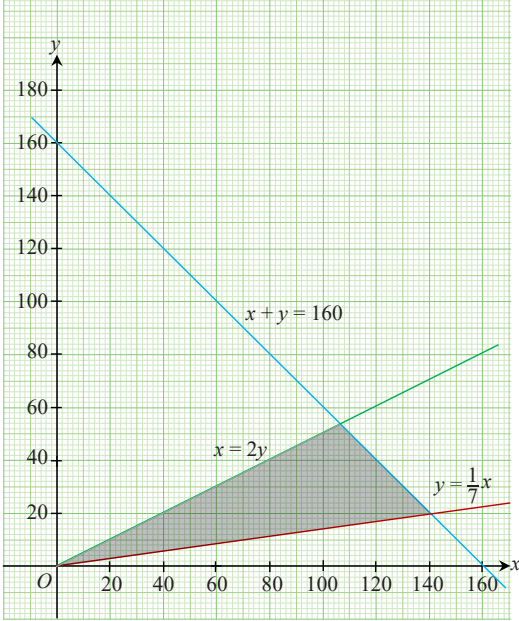
No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
4	(a) Tempoh masa <i>Time-bound</i>	1	4
	(b) $RM3\ 300 - RM1\ 840 - RM360 = RM1\ 100$ $6 \times RM1\ 100 - RM7\ 000 = -RM400$ Dia tidak mencapai matlamat kewangannya. Dia mengalami kekurangan RM400. <i>He cannot achieve his financial goal. He has a shortage of RM400.</i>	1 1 1	
	5	4	
5	Isi padu silinder + isi padu hemisfera = $\pi r^2 t + \frac{2}{3} \pi r^3$ <i>Volume of cylinder + volume of hemisphere</i> $= \left(\frac{22}{7} \times 14^2 \times 35\right) + \left(\frac{2}{3} \times \frac{22}{7} \times 14^3\right)$ $= 21\ 560 + 5\ 749\frac{1}{3}$ $= 27\ 309\frac{1}{3} \text{ cm}^3$ Jumlah bilangan guli = $27\ 309\frac{1}{3} \text{ cm}^3 - 195\frac{1}{42} \text{ cm}^3$ <i>The total number of marbles</i> $= 14$	2 1 1	4
	6	4	
	(a) Premium tahunan Encik Gan <i>Encik Gan's monthly premium</i> $= \frac{90\ 000}{1\ 000} \times RM3.58 \div 12$ $= RM26.85$ (b) Premium tahunan Puan Shapu <i>Puan Shapu's annual premium</i> $= \frac{85\ 000}{1\ 000} \times RM1.73$ $= RM147.05$ Premium tahunan Puan Phuva <i>Puan Phuva's annual premium</i> $= \frac{95\ 000}{1\ 000} \times RM2.24$ $= RM212.80$ Beza premium tahunan = $RM212.80 - RM147.05$ <i>The difference of annual premium</i> $= RM65.75$	1 1 1 1 1 1	5
7	$10x(x - 2) = 350$ $10x^2 - 2x - 350 = 0$ $x^2 - 2x - 35 = 0$ $(x - 7)(x + 5) = 0$ $x = 7$ atau / or $x = -5$ (Abaikan / Ignored)	1 1 1	5
	$AB : AC = 3 : 5$ $\frac{AB}{10(7)} = \frac{3}{5}$ $AB = 42$	1	
		1	

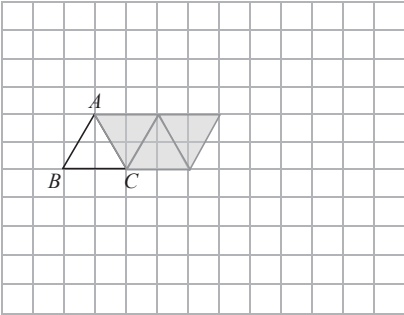
No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
	Luas segi tiga $= \frac{1}{2} (7 - 2)(42)$ <i>Area of the triangle</i> $= 105 \text{ cm}^2$	1 1	5
8	(a) $\theta = 37^\circ 58', (180^\circ - 37^\circ 58')$ $= 37^\circ 58', 142^\circ 2'$ (b) $\theta = (180^\circ - 50^\circ 35') - (360^\circ - 50^\circ 35')$ $= 129^\circ 25', 309^\circ 25'$	1 1 1 1	4
9	$I = Prt$ $= 7\,000 \times \frac{5}{100} \times 4$ $= \text{RM}1\,400$ $MV = P\left(1 + \frac{r}{n}\right)^{nt}$ $= 7\,000\left(1 + \frac{0.05}{4}\right)^{4(4)}$ $= \text{RM}8\,539.23$ Faedah = $\text{RM}8\,539.23 - \text{RM}7\,000$ <i>Interest</i> $= \text{RM}1\,539.23$ Beza faedah = $\text{RM}1\,539.23 - \text{RM}1\,400$ <i>Difference of interest</i> $= \text{RM}139.23$	1 1 1 1 1	5
10	(a) $\frac{24}{30} \times \frac{23}{29}$ $= \frac{92}{145}$ (b) $\left(\frac{6}{30} \times \frac{24}{29}\right) + \left(\frac{24}{30} \times \frac{6}{29}\right)$ $= \frac{48}{145}$	1 1 1 1	4

Bahagian B

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks								
11	(a) <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>-2</td> </tr> <tr> <td>y</td> <td>-1</td> </tr> </table> <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>2</td> </tr> <tr> <td>y</td> <td>15</td> </tr> </table>	x	-2	y	-1	x	2	y	15	1 1	
x	-2										
y	-1										
x	2										
y	15										

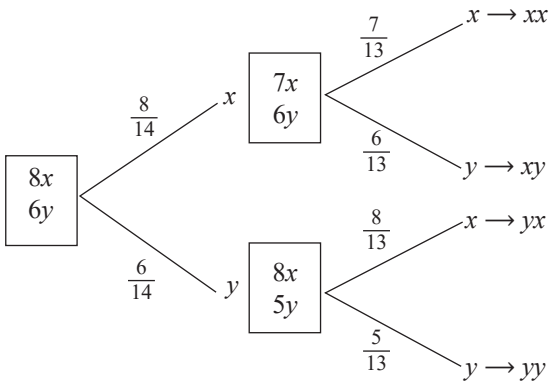
No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
(b)		4	
(c)	(i) 22 (ii) -2.75, 1.45	1 2	9
12	<p>(a) Katakan kek vanila = x, kek coklat = y <i>Let vanilla cake = x, chocolate cake = y</i></p> $28x + 24y = 194$ $16x + 12y = 104$ $\begin{bmatrix} 28 & 24 \\ 16 & 12 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 194 \\ 104 \end{bmatrix}$ $\begin{bmatrix} x \\ y \end{bmatrix} = \frac{1}{(28)(12) - (24)(16)} \begin{bmatrix} 12 & -24 \\ -16 & 28 \end{bmatrix} \begin{bmatrix} 194 \\ 104 \end{bmatrix}$ <p>$x = \text{RM}3.50$ $y = \text{RM}4$</p> <p>(b) $\begin{bmatrix} 6 & 7 \end{bmatrix} \begin{bmatrix} 3.5 \\ 4 \end{bmatrix}$ $= 49$</p> <p>Duit Amir cukup kerana RM50 melebihi RM49. <i>Amir's money is enough because RM50 exceeds RM49.</i></p>	1 1 1 1 1 1 1	9
13	<p>(a) $x = 17 - 5$ $= 12$</p> <p>$y = 21 - 12$ $= 9$</p> <p>$z = 40 - 12 - 5 - 7 - 9$ $= 7$</p>	1 1 1	

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
	(b) (i)  (ii) $5 + 9$ $= 14$	3 1 1	8
14	(a) $x \geq 2y$ $x + y \leq 160$ $y \geq \frac{1}{7}x$ (b) Lukis paksi-x dan paksi-y dengan skala yang betul. <i>Draw x-axis and y-axis with the correct scale.</i>  Garis lurus $x + y = 160$ dilukis dengan betul. <i>The straight line $x + y = 160$ is drawn correctly.</i> Garis lurus $x = 2y$ dilukis dengan betul. <i>The straight line $x = 2y$ is drawn correctly.</i> Garis lurus $y = \frac{1}{7}x$ dilukis dengan betul. <i>The straight line $y = \frac{1}{7}x$ is drawn correctly.</i> Rantau dilorek dengan betul. <i>The region is shaded correctly.</i>	1 1 1 1	
	(c) (i) 140 (ii) 20	1 1	10

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
15	(a) (i) Putaran 90 lawan arah jam pada pusat (6, 9). <i>A 90° counter-clockwise rotation at the center (6, 9).</i>	3	
	(ii) Pembesaran pada pusat (10, 9) dengan faktor skala 2. <i>Enlargement at the center (10, 9) with a scale factor of 2.</i>	3	
(b) Tiga segi tiga sama sisi dilukis dengan saiz yang betul. <i>Three equilateral triangles are drawn with the correct size.</i>		3	
			9

Bahagian C

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
16	(a) (i) Ahli Kelab STEM / <i>STEM Club members = x</i> Ahli Kelab Kewangan / <i>Finance Club members = $\frac{1}{4}x$</i> Ahli Kelab Seni / <i>Art Club members = 2</i> $x + \frac{1}{4}x + 2 = 32$ $\frac{5}{4}x = 30$ $x = 24$ Ahli Kelab Kewangan / <i>Finance Club members = $\frac{1}{4}(24)$</i> $= 6$ \therefore Nisbah / <i>Ratio = 24 : 6 : 2</i>	1 1 1	
	(ii) Peratus ahli Kelab STEM / <i>STEM Club members = $\frac{24}{32} \times 100$</i> $= 75\%$	1	
(b) Katakan bilangan murid lelaki / <i>Let the number of male students = x</i> Katakan bilangan murid perempuan / <i>Let the number of female students = y</i> $5x + 4y = 109 \dots \textcircled{1}$ $x + y = 24 \dots \textcircled{2}$ $\textcircled{2} \times 5 : 5x + 5y = 120 \dots \textcircled{3}$ $\textcircled{3} - \textcircled{1} : y = 11$ $x = 24 - 11$ $= 13$ Bilangan murid lelaki Tingkatan 1 / <i>Number of Form 1 male students</i> $= 5 \times 13$ $= 65$ Bilangan murid perempuan Tingkatan 1 / <i>Number of Form 1 female students</i> $= 4 \times 11$ $= 44$	1 1 1 1		

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
	(c) (i) $t = 6 + 5$ $= 11 \text{ s}$ (ii) Laju purata / Average speed $= \frac{30 - 0}{20 - 0}$ atau setara / or equivalent $= \frac{3}{2}$ atau setara / or equivalent	1 1 1	
	(d) Katakan duit syiling 20 sen / Let 20 cent coins = x Katakan duit syiling 50 sen / Let 50 cent coins = y  $P(xy \text{ atau } / \text{ or } yx)$ $= P(xy) + P(yx)$ $= \left(\frac{8}{14} \times \frac{6}{13}\right) + \left(\frac{6}{14} \times \frac{8}{13}\right)$ $= \frac{48}{91}$	3 1	15
17	(a) Cukai jalan kereta 1 590 cc = RM90.00 Road tax 1 590 cc Cukai jalan kereta 1 650 cc = RM200.00 + (1 650 – 1 600) × RM0.40 Road tax 1 650 cc $= \text{RM}220.00$ Cukai jalan kereta 1 950 cc = RM280.00 + (1 951 – 1 800) × RM0.50 Road tax 1 950 cc $= \text{RM}355.50$ Jumlah cukai jalan = RM90.00 + RM220.00 + RM355.50 Total road tax $= \text{RM}665.50$	1 1 1 1	
	(b) $D \rightarrow A \rightarrow C \rightarrow B$ Laluan ini mengambil masa yang paling singkat, iaitu 30 minit. This route takes the shortest time, which is 30 minutes.	1 2	
	(c) (i) $N \propto \frac{Q}{R}$ $N = \frac{kQ}{R}$ $50 = \frac{k(25)}{10}$ $k = 20$	1	

No.	Skema Pemarkahan <i>Marking Scheme</i>	Markah <i>Marks</i>	Markah Total <i>Total Marks</i>
	$N = \frac{20Q}{R}$	1	15
	(ii) $60 = \frac{20Q}{10}$	1	
	$Q = 30$	1	
	(d) $(1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) = 6$	1	
	$(2 \times 3^1) + (1 \times 3^0) = 7$	1	
	$(6 \times \text{RM}5) + (7 \times \text{RM}8)$ $= \text{RM}86$	1 1	