

KERTAS 1

1 D

$$7(-15 + 20) + \frac{3}{5} \div 2.5 = 35 + 0.24$$

$$= \frac{881}{25}$$

2 D

A: 1, 4, 9, 16, ...

$$\begin{array}{ccccccc} & +3 & +5 & +7 & & & \\ \text{A:} & 1 & 4 & 9 & 16 & & \end{array}$$

B: 2, 4, 6, 8, ...

$$\begin{array}{ccccccc} & +2 & +2 & +2 & & & \\ \text{B:} & 2 & 4 & 6 & 8 & & \end{array}$$

C: 3, 6, 9, 12, ...

$$\begin{array}{ccccccc} & +3 & +3 & +3 & & & \\ \text{C:} & 3 & 6 & 9 & 12 & & \end{array}$$

D: 4, 8, 16, 32, ...

$$\begin{array}{ccccccc} & \times 2 & \times 2 & \times 2 & & & \\ \text{D:} & 4 & 8 & 16 & 32 & & \end{array}$$

3 B

$$\frac{3^8 \times 2^4}{12} = 8\,748$$

A: $3^7 \times 2 = 4\,374$

B: $3^7 \times 2^2 = 8\,748$

C: $3^9 \times 2^2 = 78\,732$

D: $3^9 \times 2^6 = 1\,259\,712$

4 C

A: 3 029 016 = 3.03 juta / millions

B: 2 905 421 = 2.91 juta / millions

C: 4 260 572 = 4.26 juta / millions

D: 5 118 396 = 5.12 juta / millions

5 D

$$1 \times 2^3 + 1 \times 2^2 + 1 \times 2^0 = 1101_2$$

6 A

$$245_8 = 165_{10}$$

$$165 \times \frac{100}{60} = 275$$

$$275_{10} = 423_8$$

$$\begin{array}{r|l} 8 & 275 - 3 \uparrow \\ \hline 8 & 34 - 2 \\ \hline 8 & 4 - 4 \\ \hline & 0 \end{array}$$

7 C

Wang pendahuluan = RM63 000 – RM50 000

Down payment

$$= \text{RM}13\,000$$

Jumlah minimum simpanan = (RM13 000 – RM10 500) ÷ 5

Minimum amount of the saving

$$= \text{RM}2\,500 \div 5$$

$$= \text{RM}500$$

8 D

Jumlah cukai pintu = kadar cukai pintu $\times$ nilai tahunan

$$\begin{aligned}\text{Total amount of the property assessment tax} &= \text{property assessment tax rate} \times \text{annual value} \\ &= 1.5 \times 6\% \times \text{RM5 820} \\ &= \text{RM523.80}\end{aligned}$$

9 D

Premium asas = RM151.20

Basic premium

$$\begin{aligned}\text{Premium kasar} &= \text{RM151.20} \times \frac{55}{100} \\ \text{Gross premium} \\ &= \text{RM83.16}\end{aligned}$$

10 D

$$\begin{aligned}(x + 3y)(y - 3x) &= xy - 3x^2 + 3y^2 - 9xy \\ &= 3y^2 - 8xy - 3x^2\end{aligned}$$

11 A

$$V = \pi r^2 h$$

$$r^2 = \frac{V}{\pi h}$$

$$r = \sqrt{\frac{V}{\pi h}}$$

12 B

$$OR = \frac{3}{4} OS$$

$$OR = \frac{3}{4} (8)$$

$$OR = 6$$

$$\begin{aligned}m &= -\frac{\text{pintasan-}y / y\text{-intercept}}{\text{pintasan-}x / x\text{-intercept}} \\ &= -\frac{6}{8} \\ &= -\frac{3}{4}\end{aligned}$$

13 C

$$y = ax^2 + 9x + c$$

$$y = -x^2 + 9x - 18$$

$$y = -(x^2 - 9x + 18)$$

$$y = -(x - 3)(x - 6)$$

$$a = -1, \text{ bentuk / shape } \bigcap$$

$$x = 3 \text{ atau / or } x = 6$$

14 A

$2x$ lebih berat daripada $y + 5$.

$2x$ is heavier than $y + 5$.

15 C

A: $y \leq 0$ dan $y \geq -x$ adalah salah.

$y \leq 0$ and $y \geq -x$ are wrong.

B: $y \leq 0$, $y \geq -x$, $y < x - 3$ dan $x < 5$ adalah salah.

$y \leq 0$, $y \geq -x$, $y < x - 3$ and $x < 5$ are wrong.

D: $y \geq -x$, $y < x - 3$ dan $x < 5$ adalah salah.

$y \geq -x$, $y < x - 3$ and $x < 5$ are wrong.

16 B

$$\text{Kadar perubahan laju} = -\frac{v-0}{12-3}$$

The rate of change of speed

$$-14\frac{2}{3} = -\frac{v}{9}$$

$$\frac{44}{3} = \frac{v}{9}$$

$$v = 132 \text{ m s}^{-1}$$

17 D

$$x \propto y^2$$

$$x = ky^2$$

$$\frac{2}{5} = k\left(\frac{1}{2}\right)^2$$

$$\frac{2}{5} = k\left(\frac{1}{4}\right)$$

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

$$x = \frac{8}{5}y^2$$

18 C

$$R \propto \frac{1}{j^2}$$

$$R = \frac{k}{j^2}$$

$$0.5 = \frac{k}{0.1^2}$$

$$k = \frac{1}{200}$$

$$R = \frac{1}{200j^2}$$

$$2 = \frac{1}{200j^2}$$

$$j^2 = \frac{1}{400}$$

$$j = \sqrt{\frac{1}{400}}$$

$$j = \frac{1}{20}$$

$$j = 0.05$$

19 A

Katakan tinggi = t ,

Let height

Katakan isi padu = v ,

Let volume

Katakan jejari = j ,

Let radius

$$t \propto \frac{v}{j^2}$$

$$t = \frac{kv}{j^2}$$

$$7 = \frac{k(269.5)}{(3.5)^2}$$

$$k = \frac{7}{22}$$

$$t = \frac{7v}{22j^2}$$

$$21 = \frac{7v}{22j^2}$$

$$21 = \frac{7(1\,996.5)}{22j^2}$$

$$j^2 = 30.25$$

$$j = \sqrt{30.25}$$

$$j = 5.5 \text{ cm}$$

20 A

$$M + \begin{bmatrix} 4 & 6 \\ -3 & -15 \end{bmatrix} = \begin{bmatrix} 17 & -10 \\ 6 & -5 \end{bmatrix}$$

$$M = \begin{bmatrix} 17 & -10 \\ 6 & -5 \end{bmatrix} - \begin{bmatrix} 4 & 6 \\ -3 & -15 \end{bmatrix}$$

$$M = \begin{bmatrix} 17-4 & -10-6 \\ 6-(-3) & -5-(-15) \end{bmatrix}$$

$$M = \begin{bmatrix} 13 & -16 \\ 9 & 10 \end{bmatrix}$$

21 A

$$P = Q$$

$$\begin{bmatrix} 5 & x+y \\ x & z \end{bmatrix} = \begin{bmatrix} 5 & 8 \\ 6 & x-y \end{bmatrix}$$

$$x = 6$$

$$x + y = 8$$

$$6 + y = 8$$

$$y = 8 - 6$$

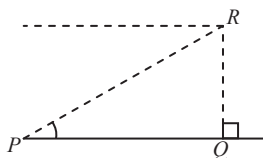
$$y = 2$$

$$z = x - y$$

$$z = 6 - 2$$

$$z = 4$$

22 A



$\angle QPR$

23 B

$$\text{Isi padu kon} = \frac{1}{3} \pi j^2 t$$

$$\text{Volume of cone} = \frac{1}{3} \pi r^2 h$$

$$\text{Isi padu hemisfera} = \frac{2}{3} \pi j^3$$

$$\text{Volume of hemisphere} = \frac{2}{3} \pi r^3$$

Isi padu gabungan pepejal

Volume of the combined solid

$$\begin{aligned}
 &= \frac{1}{3} \pi j^2 t + \frac{2}{3} \pi j^3 \\
 &= \frac{1}{3} \left(\frac{22}{7} \right) (3)^2 (7) + \frac{2}{3} \left(\frac{22}{7} \right) (3)^3 \\
 &= 66 + 56 \frac{4}{7} \\
 &= 122 \frac{4}{7} \text{ cm}^3
 \end{aligned}$$

24 C

$$\begin{aligned}
 x &= \angle LJN + \angle JLM \\
 &= 60^\circ + 32^\circ \\
 &= 92^\circ
 \end{aligned}$$

25 D

$P \rightarrow S$: Pantulan / *Reflection*

$S \rightarrow R$: Translasi / *Translation*

26 A

$$k = \frac{\text{panjang sisi imej} / \text{a side of an image}}{\text{panjang sisi objek} / \text{a side of an object}}$$

$$k = \frac{3}{6}$$

$$k = \frac{1}{2}$$

Arah bertentangan, $\therefore k = -\frac{1}{2}$
Opposite direction

27 C

$$\sin x = -\frac{\sqrt{3}}{2}$$

$$x = -60^\circ$$

$$x = 180^\circ - 60^\circ$$

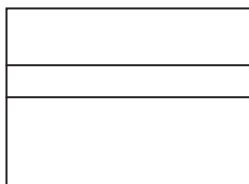
$$x = 120^\circ$$

$$\tan 60^\circ = \frac{m}{n}$$

$$m = n \tan 60^\circ$$

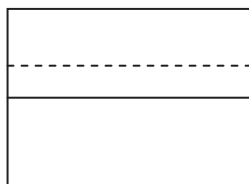
28 B

A:



← Salah / *Wrong*

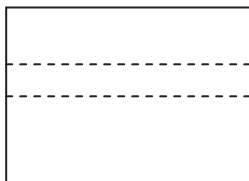
C:



← Salah / *Wrong*

← Salah / *Wrong*

D:



Salah / Wrong

29 D

A: $(a - b)^2 = a^2 - b^2$ (Palsu / False)

B: $m - 7 = 4$ (Bukan pernyataan / Not a statement)

C: $(-2)^2 = -4$ (Palsu / False)

D: $\{3, 6, 9\} \cap \{9, 16\} = \{9\}$ (Benar / True)

30 B

	Bentuk III Form III
Premis 1 Premise 1	Jika p , maka q If p , then q
Premis 2 Premise 2	Bukan q adalah benar Not q is true
Kesimpulan Conclusion	Bukan p adalah benar Not p is true

$p: x = 3$

$q: x + 2 = 5$

$\therefore$ Jika $x = 3$ maka $x + 2 = 5$

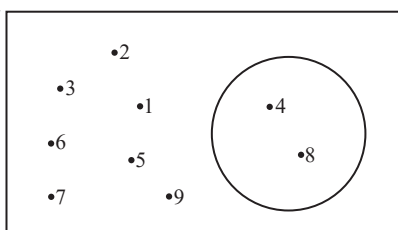
If $x = 3$ then $x + 2 = 5$

31 C

$\zeta = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

Set $P = \{4, 8\}$

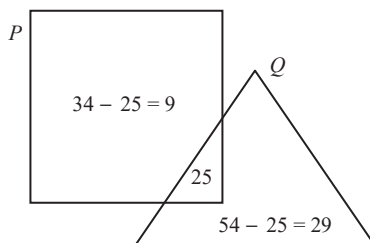
ζ



32 A

$$\begin{aligned} n(P) + n(Q) &= 34 + 54 \\ &= 88 \end{aligned}$$

$$\begin{aligned} n(P \cap Q) &= 88 - n(P \cup Q) \\ &= 88 - 63 \\ &= 25 \end{aligned}$$



33 C

$$\begin{aligned} \text{A: } P_1 \rightarrow P_2 \rightarrow P_3 \rightarrow P_7 \\ &= 70 \text{ km} + 40 \text{ km} + 30 \text{ km} \\ &= 140 \text{ km} \end{aligned}$$

$$\begin{aligned} \text{B: } P_1 \rightarrow P_2 \rightarrow P_6 \rightarrow P_7 \\ &= 70 \text{ km} + 90 \text{ km} + 60 \text{ km} \\ &= 220 \text{ km} \end{aligned}$$

$$\begin{aligned} \text{C: } P_1 \rightarrow P_4 \rightarrow P_2 \rightarrow P_7 \\ &= 40 \text{ km} + 50 \text{ km} + 80 \text{ km} \\ &= 170 \text{ km} \end{aligned}$$

$$\begin{aligned} \text{D: } P_1 \rightarrow P_4 \rightarrow P_5 \rightarrow P_7 \\ &= 40 \text{ km} + 30 \text{ km} + 50 \text{ km} \\ &= 120 \text{ km} \end{aligned}$$

34 A

$$\begin{aligned} \text{Sudut sektor} &= \frac{18.42}{9.18 + 18.42 + 1.36} \times 360^\circ \\ \text{Angle of sector} &= 229^\circ \end{aligned}$$

35 B

Skor <i>Score</i>	2	3	4	5
Kekerapan <i>Frequency</i>	3	8	7	4

$$\begin{aligned} \text{Min skor baharu} &= \frac{(2 \times 3) + (3 \times 8) + (4 \times 7) + (5 \times 4)}{3 + 8 + 7 + 4} \\ \text{New mean score} &= \frac{78}{22} \\ &= 3.55 \end{aligned}$$

36 B

Kebarangkalian memilih sebiji guli bukan berwarna hijau / *Probability of choosing marble that is not green*

$$\begin{aligned} &= \frac{6 + 4}{6 + 4 + 9} \\ &= \frac{10}{19} \end{aligned}$$

37 D

Kotak Q tidak mengandungi bola biru.

Box Q does not consist of blue balls.

38 D

$$\begin{aligned} x + 5 + x + 2x + 3 &= 40 \\ 4x + 8 &= 40 \\ 4x &= 32 \\ x &= 8 \end{aligned}$$

$$\begin{aligned} \text{Kebarangkalian peserta mengambil bahagian dalam kedua-dua kuiz} &= \frac{8}{40} \\ \text{Probability of the participant takes part in both quizzes} &= \frac{1}{5} \end{aligned}$$

39 B

A: Titik 60 dan 80 adalah salah

Points 60 and 80 are wrong

C: 65 bukan median

65 is not a median

D: Titik 35 dan 85 adalah salah

Points 35 and 85 are wrong

40 B

$$\text{Persentil ke-40} = \frac{40}{100} \times 60$$

40th percentile

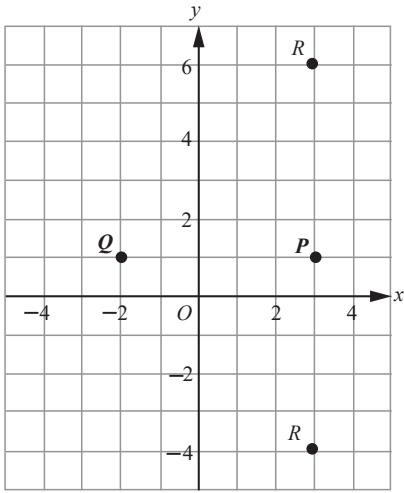
$$= 24$$

Dari graf, markah ialah 61.5.

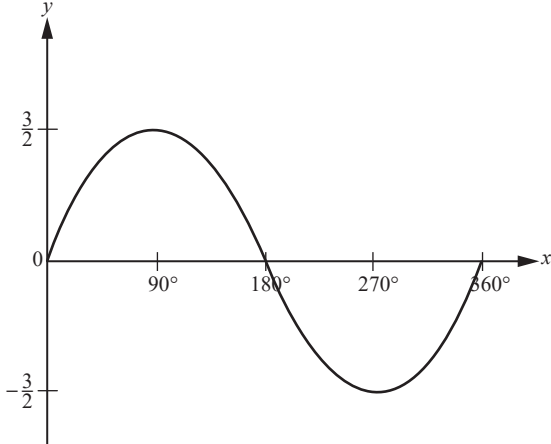
From the graph, the marks is 61.5.

KERTAS 2

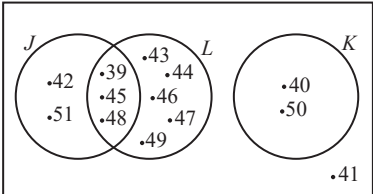
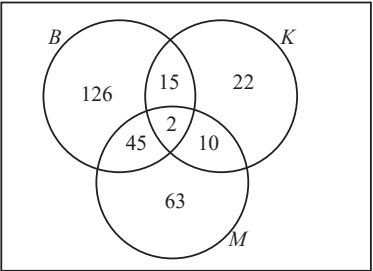
Bahagian A

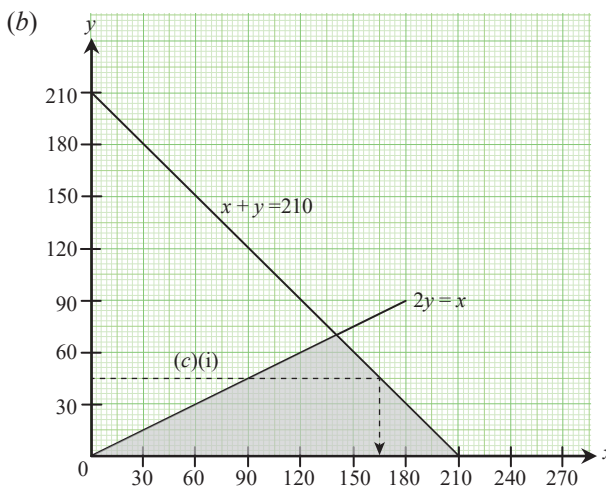
No.	Skema Pemarkahan <i>Marking Scheme</i>	Markah <i>Marks</i>	Markah Total <i>Total Marks</i>
1	(a)  R ditanda di (3, 6) atau (3, -4). <i>R is marked at (3, 6) or (3, -4).</i> (b) Jarak antara titik R dan titik Q <i>Distance between points R and Q</i> $= \sqrt{[3 - (-2)]^2 + (6 - 1)^2}$ atau / or $\sqrt{[3 - (-2)]^2 + (-4 - 1)^2}$ $= 7.07$ unit	1	3
2	(a) $Q_1 = 5$ (b) Julat antara kuartil / <i>Interquartile range</i> $= Q_3 - Q_1$ $= 16 - 5$ $= 11$	1	
		1	3

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
3	(a) Akas: Jika $2x - 3 = 5$, maka $x = 4$. Converse: If $2x - 3 = 5$, then $x = 4$.	1	4
	Kontrapositif: Jika $2x - 3 \neq 5$, maka $x \neq 4$. Contrapositive: If $2x - 3 \neq 5$, then $x \neq 4$.	1	
	(b) $8(n)^2 - 4$, $n = 1, 2, 3, 4, \dots$	2	
4	(a) Y: Menilai kedudukan kewangan. Evaluating financial status.	1	4
	(b) Aliran tunai / Cash flow = RM8 500 + RM1 200 - $\left(\frac{12}{100} \times 8\,500\right)$ - RM4 350 - RM3 610 = RM720	2 1	
5	$\left[\frac{1}{2}(50 + QP)(24)\right] - (10 \times 8) = 628$ $600 + 12QP = 708$ $QP = 9\text{ m}$	2 1	3
6	(a) $\frac{80}{100} \times 300\,000 = 240\,000$ Bayaran pampasan / Amount of compensation = $\frac{\text{Jumlah insurans yang telah dibeli}}{\text{Jumlah insurans yang harus dibeli}} \times \text{Jumlah kerugian} - \text{Deduktibel}$ = $\frac{\text{Amount of insurance purchased}}{\text{Amount of insurance to be purchased}} \times \text{Total loss} - \text{Deductible}$ = $\frac{200\,000}{240\,000} \times 30\,000 - 2\,500$ = RM22 500	1 1 1	4
	(b) Penalti ko-insurans / Co-insurance penalty = $30\,000 - \left(\frac{200\,000}{240\,000} \times 30\,000\right)$ = RM5 000	 1	
7	Luas kolam renang – Luas bahagian kanak-kanak = Luas bahagian dewasa Area of the swimming pool – Area of children's section = Area of adults' section $\left[(7x - 2)\left(2 \times \frac{5}{2}x\right)\right] - 12\frac{4}{7} = 107\frac{3}{7}$ $35x^2 - 10x - 120 = 0$ $(7x + 12)(x - 2) = 0$ $x = -\frac{12}{7}$ atau / or $x = 2$ $\therefore x = 2$	1	4
		1	
		1	
		1	
		1	
8	Katakan pelitup muka = m Let face mask = m Katakan pensanitasi tangan = k Let hand sanitizer = k $3m + 4k = 148.40$ $2(2m + 6k) = 301.20$ $4m + 12k = 301.20$	1	

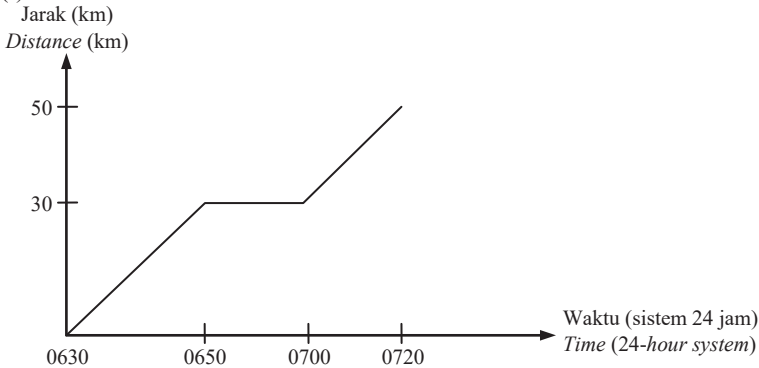
No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
	$\begin{bmatrix} 3 & 4 \\ 4 & 12 \end{bmatrix} \begin{bmatrix} m \\ k \end{bmatrix} = \begin{bmatrix} 148.40 \\ 301.20 \end{bmatrix}$ $\begin{bmatrix} m \\ k \end{bmatrix} = \frac{1}{(3)(12) - (4)(4)} \begin{bmatrix} 12 & -4 \\ -4 & 3 \end{bmatrix} \begin{bmatrix} 148.40 \\ 301.20 \end{bmatrix}$ $\begin{bmatrix} m \\ k \end{bmatrix} = \frac{1}{20} \begin{bmatrix} (12 \times 148.40) + (-4 \times 301.20) \\ (-4 \times 148.40) + (3 \times 301.20) \end{bmatrix}$ $\begin{bmatrix} m \\ k \end{bmatrix} = \frac{1}{20} \begin{bmatrix} 576 \\ 310 \end{bmatrix}$ $\begin{bmatrix} m \\ k \end{bmatrix} = \begin{bmatrix} 28.8 \\ 15.5 \end{bmatrix}$ $m = \text{RM}28.80$ $k = \text{RM}15.50$	1 1 1 1	5
9	(a) (i) $M' = (3, 0)$ (ii) Putaran lawan arah jam pada pusat $(-4, 2)$. <i>Anticlockwise rotation at centre $(-4, 2)$.</i> atau / or Putaran ikut arah jam pada pusat $(1, -7)$. <i>Clockwise rotation at centre $(1, -7)$.</i>	1 2	5
	(b) Translasi / Translation $\begin{pmatrix} 11 \\ 11 \end{pmatrix}$ atau / or Pantulan pada garis $y = -x$. <i>Reflection on line $y = -x$.</i>	2	
10	(a) 	2	5
	(b) (i) $PR = \sqrt{30^2 + 15^2}$ $= 33.54 \text{ cm}$	1 1	
	(ii) $\cos / \cos y^\circ = \frac{30}{33.54}$ (Sukuan / <i>Quadrant II</i>) $\cos / \cos y^\circ = -0.89$	1	

Bahagian B

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
11	(a) (i) $2y = -3x + 8$ $y = -\frac{3}{2}x + 4$ $m = -\frac{3}{2}$ (ii) $2(0) = -3x + 8$ $x = \frac{8}{3}$ $\therefore$ Pintasan-x / x-intercept $= \frac{8}{3}$	1 1 1	8
	(b) (i) $m = \frac{3-2}{0-(-2)}$ $= \frac{1}{2}$ $y = mx + c$ $y = \frac{1}{2}x + 3$ $y = \frac{1}{2}(8) + 3$ $y = 7$ Koordinat zoo / The coordinates of zoo $= (8, 7)$ (ii) $7 = -\frac{1}{4}(8) + c$ $c = 9$ $y = -\frac{1}{4}x + 9$	1 1 1 1 1	
12	(a) (i) $J = \{39, 42, 45, 48, 51\}$ $L = \{39, 43, 44, 45, 46, 47, 48, 49\}$ (ii) ζ 	1 1 3	8
	(b) (i) ζ  (ii) Bilangan responden yang tidak memilih sebarang syarikat penerbangan Number of respondents who do not choose any airlines $= 300 - 126 - 15 - 22 - 2 - 45 - 10 - 63$ $= 17$	2 1 1	

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
14	(a) $x + y \leq 210$ $x \geq 2y$	1 1	
	(b) 	4	
	(c) (i) Bilangan maksimum murid sekolah menengah = 165 <i>The maximum number of secondary school students</i>	1	
	(ii) Jumlah yuran minimum yang diterima penganjur <i>Total minimum fees received by the organiser</i> = $(90 \times \text{RM}150) + (45 \times \text{RM}120)$ = RM18 900	1 1	
15	(a) Pendapatan bercukai Encik Farqan / <i>Encik Farqan's chargeable income</i> = RM77 600 – RM12 600 – RM9 000 – RM3 360 – RM2 500 = RM50 140	1 1	
	(b) Cukai pendapatan / <i>Income tax</i> = $\text{RM}1\,800 + \left[(\text{RM}50\,140 - \text{RM}50\,000) \times \frac{13}{100} \right] - \text{RM}840$ = $\text{RM}1\,800 + \text{RM}18.20 - \text{RM}840$ = RM978.20	2 1	
	(c) (i) Potongan cukai bulanan (PCB) pada tahun tersebut <i>Monthly tax deduction (PCB) in that year</i> = $\text{RM}120 \times 12$ = RM1 440 Tidak perlu, RM1 440 melebihi RM978.20. <i>No need, RM1 440 exceeds RM978.20.</i>	1 1	
	(ii) LHDN perlu memulangkan lebih kepada Encik Farqan. <i>IRB should refund the excess deduction to Encik Farqan.</i>	1	

Bahagian C

No.	Skema Pemarkahan Marking Scheme	Markah Marks	Markah Total Total Marks
16	(a) (i) $15 : 18 = 5 : 6$	1	
	(ii) $18x + 15(14) = 390$ $18x = 390 - 210$ $x = \frac{180}{18}$ $x = 10$	1	
		1	
	(b) (i)	3	
			
	(ii) Laju van / Speed of the van $= \frac{30 - 0}{50 - 30}$ $= \frac{3}{2} \text{ km min}^{-1}$		
	$\frac{23(2) + 24(2) + 26(3) + 28(4) + 30(2) + 32(2) + 35(2) + 36(4) + 38(3)}{2 + 2 + 3 + 4 + 2 + 2 + 2 + 4 + 3}$	2	
(c) Min / Mean $= \frac{23(2) + 24(2) + 26(3) + 28(4) + 30(2) + 32(2) + 35(2) + 36(4) + 38(3)}{2 + 2 + 3 + 4 + 2 + 2 + 2 + 4 + 3}$	1		
$= 30 \frac{2}{3}$			
$\therefore$ Setuju dengan kenyataan pemain tersebut. Agree with the player's statement.	1		
(d) Kebarangkalian pasukan lelaki $= \left(\frac{2}{5} \times \frac{7}{15}\right) + \left(\frac{3}{5} \times \frac{8}{15}\right) + \left(\frac{2}{5} \times \frac{8}{15}\right)$ Probability of boys team $= \frac{54}{75}$	1		
Kebarangkalian pasukan perempuan $= \left(\frac{3}{7} \times \frac{5}{8}\right) + \left(\frac{4}{7} \times \frac{3}{8}\right) + \left(\frac{3}{7} \times \frac{3}{8}\right)$ Probability of girls team $= \frac{36}{56}$	1		
	$= \frac{36}{56}$	1	
	Kedua-dua pasukan lelaki dan perempuan berpeluang ke peringkat seterusnya kerana kedua-dua kebarangkalian melebihi $\frac{3}{5}$. Both boys and girls team get the chance to the next stage because both the probability exceeds $\frac{3}{5}$.	1	
			15
17	(a) (i) $25 \text{ km j}^{-1} / \text{ km h}^{-1}$	1	
	(ii) Jarak yang dilalui $= \frac{1}{2} \times 25 \times 0.5$ Distance travelled $= 6.25 \text{ km}$	1	
		1	

