Penyelesaian Lengkap

SET 4

KERTAS 1

1 C

231_9

$2(9^2) = 162$

625_7

$2(7^1) = 14$

2410_5

$2(5^3) = 250$

21010_3

$2(3^4) = 162$

2 B

$10.4576 \div 7.6 \times 10^{-3} = 1376$

3 A

$$35y + 1 = \frac{6}{y}$$

$$35y^2 + y - 6 = 0$$

$$(7y + 3)(5y - 2) = 0$$

$$y = \frac{-3}{7} \text{ atau/}or\ y = \frac{2}{5}$$

4 D

$$\sqrt{6\frac{25}{4}} \div \sqrt[3]{2^3 + (4^2 + 3)}$$

$$= \sqrt{\frac{49}{4}} \div \sqrt[3]{2^3 + (19)}$$

$$= \frac{7}{2} \div \sqrt[3]{27}$$

$$= \frac{7}{2} \div 3$$

$$= \frac{7}{6}$$

5 D

6 B

$$\frac{x}{0.125}(2y) \geqslant 1\,600$$

$$16xy \geqslant 1\,600$$

$$xy \geqslant 100$$

7 A

Sudut *SPQ* ialah 90°.
Angle SPQ is 90°.

$k = 180 - 90 - 58$

$= 32°$

Sudut *SQR* ialah 21°.
Angle SQR is 21°.

Sudut/*Angle ROQ*

$= 180° - 21° - 21°$

$= 138°$

$n = 180 - 138$

$= 42°$

$$m = \frac{180° - 42°}{2}$$

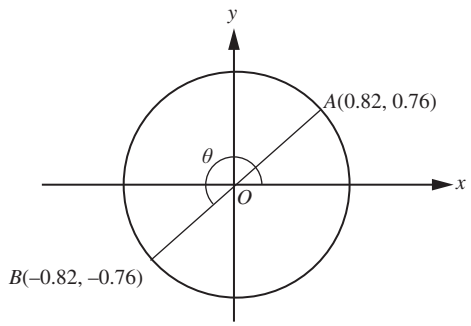
$= 69°$

$k + m + n$

$= 32° + 69° + 42°$

$= 143°$

8 D



$\cos\theta = -\cos\alpha$

$$= -\frac{0.82}{1}$$

$= -0.82$

9 B

$\xi = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16\}$

$P = \{4, 5, 10\}$

$Q = \{4, 8, 12, 16\}$

$P' \cap Q = \{8, 12, 16\}$

10 B

1 500 m : 5 km : 200 000 cm

= 1.5 km : 5 km : 2 km

= 3 : 10 : 4

11 D

12 C

$$\frac{185 - 120}{6} \approx 10.83 = 11$$

13 B

$$\frac{6}{d} = \frac{2d}{3 + e^2}$$

$$18 + 6e^2 = 2d^2$$

$$d^2 = 3e^2 + 9$$

$$d = \sqrt{3e^2 + 9}$$

14 A

$E(-5, 4)$, $F(3, 31)$, $G(11, 4)$, $H(3, 1)$

Panjang pepenjuru *EG* ialah 16 unit.
Length of diagonal EG is 16 *units.*

Panjang pepenjuru *FH* ialah 30 unit.
Length of diagonal FH is 30 *units.*

Panjang 1 sisi rombus
Length of 1 *side of rhombus*

$= \sqrt{8^2 + 15^2}$

$= 17$

Perimeter

$= 17 \times 4$

$= 68$

15 D

$6x + 3y = 5$

$3y = -6x + 5$

$$y = -2x + \frac{5}{3}$$

$y = -2x + c$

Di/*At* (7, 8)

$8 = -2(7) + c$

$c = 8 + 14$

$= 22$

$y = -2x + 22$

16 C
$$\frac{(p^{6k}q^{9k})^{\frac{1}{3}}}{p^{-k}q^{2k}}$$
$$=\frac{p^{2k}q^{3k}}{p^{-k}q^{2k}}$$
$$=p^{3k}q^{k}$$
$3k = 21$
$k = 7$

17 B
$$\sqrt{\frac{\sum x^2}{26}-\left(\frac{130}{26}\right)^2}=10$$
$$\frac{\sum x^2}{26}-\left(\frac{130}{26}\right)^2=100$$
$$\frac{\sum x^2}{26}=125$$
$$\sum x^2=3\,250$$

18 B
$$\frac{3}{2^{-4}}$$
$= 3(2^4)$
$e = 3, f = 2, g = 4$

19 A
$$6.6 \div 11 + 0.2 \times 3\frac{1}{2}$$
$= 0.6 + 0.7$
$= 1.3$

20 B

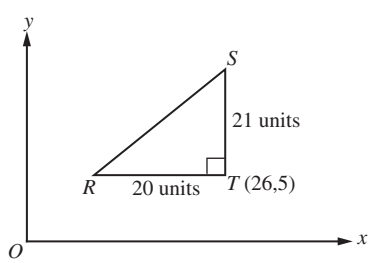
Bilangan tahun ***Number of years***	**Titik tengah,** ***x*** ***Midpoint, x***	**Kekerapan longgokan** ***Cumulative frequency***	**Kekerapan,** ***f*** ***Frequency, f***	***fx***
1 – 5	3	3	3	9
6 – 10	8	8	5	40
11 – 15	13	16	8	104
16 – 20	18	28	12	216
21 – 25	23	35	7	161
			$\sum f = 35$	$\sum fx = 530$

Min/Mean
$$=\frac{530}{35}$$
$= 15.14$

21 A Kuasa tiga sempurna/*Perfect cube*
$= \{1, 64\}$
Huruf vokal/*Vowel letter*
$= \{A, E\}$
Kebarangkalian/*Probability*
$$=\frac{2}{3}\times\frac{2}{4}$$
$$=\frac{1}{3}$$

22 D $d_{in}(P) = 1$
$d_{out}(U) = 2$
Maka/*Thus*, $d_{in}(P) \neq d_{out}(U)$

23 A



$R(6, 5)$
$S(26, 26)$

Kecerunan *RS*/*Gradient of RS*
$$=\frac{26-5}{26-6}$$
$$=\frac{21}{20}$$
$$y=\frac{21}{20}x+c$$
Di/*At* $T(26, 5)$,
$$5=\frac{21}{20}(26)+c$$
$$c=\frac{-223}{10}$$
$$y=\frac{21}{20}x-\frac{223}{10}$$

24 D

25 B

26 C
$$\frac{r-t}{2r+2t}\div\frac{0.5r-0.5t}{r+t}$$
$$=\frac{r-t}{2(r+t)}\times\frac{r+t}{0.5(r+1)}$$
$$=\frac{r-t}{r+t}$$

27 D
$$\tan 54.47^\circ=\frac{x}{300}$$
$x = 420$ cm
Tinggi pokok krismas/*Height of christmas tree*
$= 420$ cm $+ 180$ cm
$= 600$ cm

28 D

29 B Katakan x mewakili jumlah bilangan roti dalam bakul.
Let x represents the total number of buns in the basket
$$\frac{9}{19}=\frac{180}{x}$$
$$x=380$$
$380 - 180 = 200$

30 D
$$4x=\frac{8^2}{x-6}$$
$$4x(x-6)=64$$
$$x(x-6)=16$$
$x^2 - 6x - 16 = 0$
$(x - 8)(x + 2) = 0$
$x = 8$ atau/*or* $x = -2$

31 D

32 C

33 C
$$e\propto\frac{g^2}{f}$$
$$e=\frac{kg^2}{f}$$
$$120=\frac{100k}{5}$$
$$k=6$$
$$e=\frac{6g^2}{f}$$
$$=\frac{6(5)}{2}$$
$$=15$$

34 D
$$y\propto\frac{1}{x}$$
$$y=\frac{k}{x}$$
$$28=\frac{k}{4}$$
$$k=112$$

35 A
$$\frac{1}{2}\begin{pmatrix}10 & 6\\ 8 & 2\end{pmatrix}\begin{pmatrix}1 & 5 & 7\\ 3 & 4 & -2\end{pmatrix}$$
$$=\begin{pmatrix}5 & 3\\ 4 & 1\end{pmatrix}\begin{pmatrix}1 & 5 & 7\\ 3 & 4 & -2\end{pmatrix}$$
$$=\begin{pmatrix}14 & 37 & 29\\ 7 & 24 & 26\end{pmatrix}$$

36 C
$$MV = P\left(1+\frac{r}{n}\right)^{nt}$$
$$MV = 15\,000\left(1+\frac{0.05}{4}\right)^{4(3)}$$
$$= \text{RM}17\,411.32$$
Faedah/*Interest*
$= \text{RM}17\,411.32 - \text{RM}15\,000$
$= \text{RM}2\,411.32$

37 B
$$xy = 72$$
$$4xy + 2y^2 = 360$$
$$4(72) + 2y^2 = 360$$
$$2y^2 = 72$$
$$y^2 = 36$$
$$y = 6$$
$$x = 12$$
Nisbah/*Ratio*
$= 3\times2\times2 : 12\times6\times6$
$= 12 : 432$
$= 1 : 36$

38 A

39 B
$$e\begin{pmatrix}-2 & 4\\ -1 & 3\end{pmatrix}$$
$$A=\begin{pmatrix}3 & -4\\ 1 & -2\end{pmatrix}$$
$$e=\frac{1}{3(-2)-1(-4)}$$
$$=\frac{1}{-2}$$

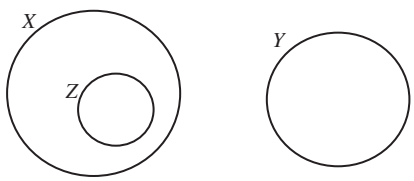
40 B

KERTAS 2

Bahagian A

1 (a) $M = \{17, 19\}$
Subset $= \{17\},\{19\},\{17, 19\},\{\ \}$

(b)



2 $y > x + 1$
$y < 4$
$y \geqslant -2x - 5$

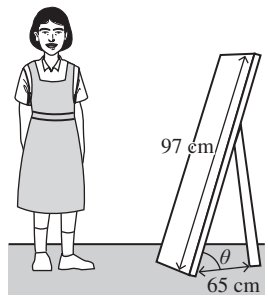
3
$$\begin{pmatrix}x & 4y\\ x+1 & y\end{pmatrix}\begin{pmatrix}45\\ 95\end{pmatrix}=\begin{pmatrix}985\\ 460\end{pmatrix}$$
$$\begin{pmatrix}45\\ 95\end{pmatrix}=\frac{1}{xy-4xy-4y}\begin{pmatrix}x & -4y\\ -x-1 & x\end{pmatrix}\begin{pmatrix}985\\ 460\end{pmatrix}$$
$$=\frac{1}{-3xy-4y}\begin{pmatrix}-855y\\ -985x-985+460x\end{pmatrix}$$
$$=\begin{pmatrix}\dfrac{855}{3x+4}\\[2ex] \dfrac{-525x-985}{-3xy-4y}\end{pmatrix}$$
$$\frac{855}{3x+4}=45$$
$$x=5$$
$$\frac{-525x-985}{-3xy-4y}=95$$
$$\frac{-525(5)-985}{-3(5)y-4y}=95$$
$$15y+4y=38$$
$$y=2$$

4 (a)

Perkara *Item*	**Boleh dituntut** *Can be claimed*
Kerosakan motosikal Remon *Damage to Remon's motorcycle*	✓
Kerosakan kereta Jonathan *Damage to Jonathan's car*	✓
Kerugian kecederaan Cindy *The loss on Cindy's injury*	
Kerugian kecederaan Faiz *The loss on Faiz's injury*	
Kerugian kecederaan Remon *The loss on Remon's injury*	✓

(b) Pihak ketiga, kebakaran dan kecurian
Third party, fire and theft

5



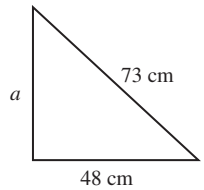
$$\cos\theta=\frac{65}{97}$$
$$\theta=\cos^{-1}\frac{65}{97}$$
$$=47.92°$$
$$\sin\alpha=\frac{90}{97}$$
$$\alpha=\sin^{-1}\frac{90}{97}$$
$$=68.10°$$
Perbezaan/*Difference*
$= 68.10° - 47.92°$
$= 20.18°$

6 (a) Bukan
No

(b) Jika matriks X ialah matriks identiti, maka unsur pepenjuru bagi matriks X ialah satu dan unsur lain ialah sifar.
Jika unsur pepenjuru bagi matriks X ialah satu dan unsur lain ialah sifar, maka matriks X ialah matriks identiti.
If matrix X is an identity matrix, then the diagonal elements of matrix X are ones and the other elements are zeroes.
If the diagonal elements of matrix X are ones and the other elements are zeroes, then matrix X is an identity matrix.

(c) $6(n^3) + (n + 1)$, di mana $n = 1, 2, 3, ...$
$6(n^3) + (n + 1)$, *where* $n = 1, 2, 3, ...$

7



$a = \sqrt{73^2 - 48^2}$
$= 55$
Isi padu prisma/*Volume of prism*
$= 0.5(0.96)(0.55)(6)2$
$= 3.168\ m^2$
Isi padu silinder/*Volume of cylinder*
$= \frac{22}{7} \times 0.55^2 \times 2$
$= 0.01571\ m^3$
Isi padu pepejal yang tinggal/*Volume of remaining solid*
$= 3.168\ m^2 - 0.01571\ m^3$
$= 3.152\ m^3$

8 (a) Kecerunan/*Gradient* $= \frac{8}{15}$

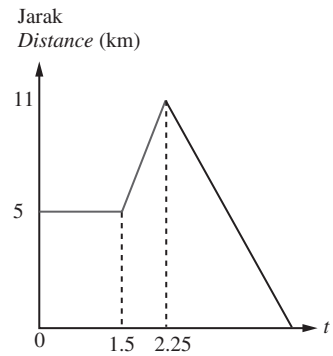
$y = \frac{8}{15}x$

(b) Jarak titik *F* dari titik *O*/*Distance of point F from point O*
$= \sqrt{8^2 + 15^2}$
$= 17$

$y = \frac{8}{15}x + 17$

Apabila/*When* $y = 0$, $x = -31.875$
Jarak/*Distance*
$= \sqrt{17^2 + 31.875^2}$
$= 36.13$

9



(a) (2.25, 11) (*x*, 0)

$\frac{11 - 0}{2.25 - x} = -22$

$2.25 - x = -0.5$

$x = 2.75$

0.5 jam = 30 minit
0.5 *hour* = 30 *minutes*
t = 1 415
1.5 jam = 90 minit
1.5 *hours* = 90 *minutes*

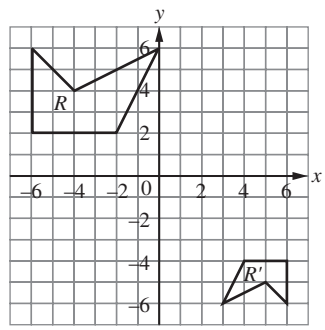
10 (a) $a = 2$
(b) $b = 0.5$
(c) $c = -1$

Bahagian B

11 (a) $y = -x$
(b) (2, –2)
(c) *K* ialah pembesaran pada pusat (2, –2) dengan faktor skala $-\frac{1}{2}$.

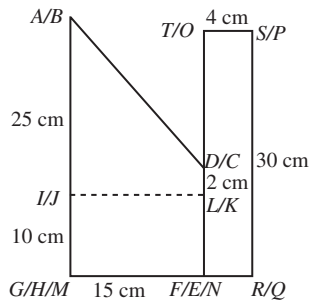
K is an enlargement at centre (2, –2) *with scale factor* $-\frac{1}{2}$.

(d)

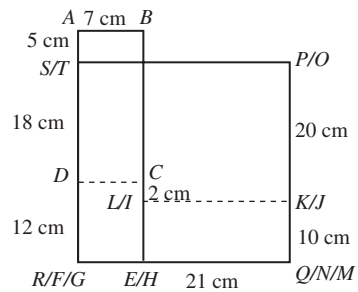


(e) Luas imej = $k^2 \times$ Luas objek
Area of image = $k^2 \times$ *Area of object*
$= (-0.5)^2 \times 128$
$= 32\ cm^2$

12 (a)



(b)



13 (a)

Kumpulan *Group*	**Bilangan murid** *Number of pupils*	**Min** *Mean*	**Sisihan piawai** *Standard deviation*
P	15	170	2.0
Q	10	158	1.5

Kumpulan/*Group P*
Min/*Mean* = 170

$\frac{\Sigma x}{\Sigma f} = 170$

$\frac{\Sigma x}{15} = 170$

$\Sigma x = 2\,550$

Sisihan Piawai/*Standard deviation* = 2

$\sqrt{\frac{\Sigma x^2}{\Sigma f} - x^2} = 2$

$\sqrt{\frac{\Sigma x^2}{15} - 170^2} = 2$

$\frac{\Sigma x^2}{15} - 170^2 = 4$

$\Sigma x^2 = 434\,560$

Kumpulan/*Group Q*
Min/*Mean* = 158

$$\frac{\sum x}{15} = 158$$

$$\frac{\sum x}{10} = 158$$

$$\sum x = 1\,580$$

Sisihan Piawai/*Standard deviation* = 1.5

$$\sqrt{\frac{\sum x^2}{\sum f} - x^2} = 1.5$$

$$\sqrt{\frac{\sum x^2}{10} - 158^2} = 1.5$$

$$\frac{\sum x^2}{10} - 158^2 = 1.5$$

$$\sum x^2 = 249\,662.5$$

Kumpulan yang digabungkan/*Combined group*
Jumlah $\sum x$ /*Total* $\sum x$
= 2 550 + 1 580
= 4 130
Jumlah $\sum x^2$ /*Total* $\sum x^2$
= 433 560 + 249 662.5
= 683 222.5
Min/*Mean*

$$= \frac{4\,130}{25}$$

= 165.2
Sisihan Piawai/*Standard deviation*

$$= \sqrt{\frac{683\,222.5}{25} - 165.2^2}$$

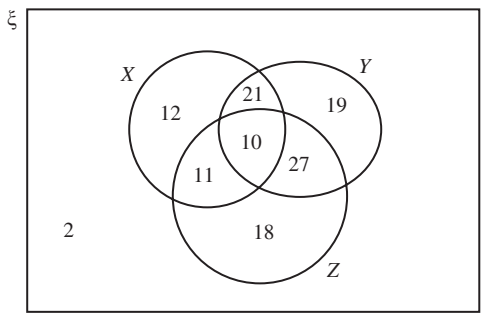
= 6.153

(b) 2, 6, 9, 12, 15
Julat antara kuartil/*Interquartile range*
$= Q_3 - Q_1$

$$= \frac{12+15}{2} - \frac{2+6}{2}$$

= 13.5 – 4
= 9.5
(i) 9.5
(ii) 19

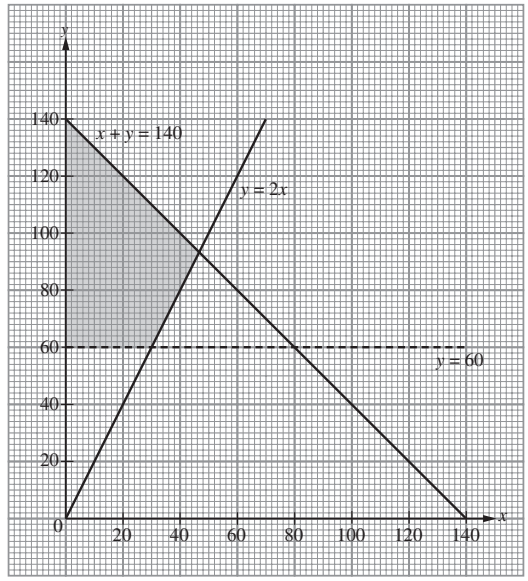
14 (a)



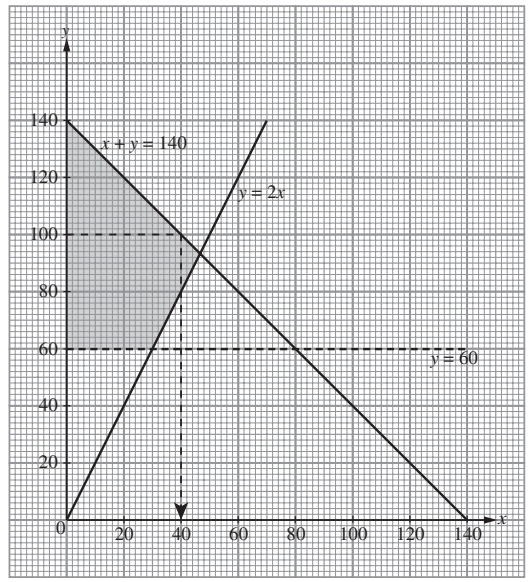
(b) (i) 21 + 11 + 27 + 10 = 69
(ii) 12 + 18 + 19 + 2 = 51
(iii) 21 + 10 + 27 + 19 + 11 + 18 = 106
(c) 18

15 (a) $x + y \leq 140$
$y \geq 2x$
$y > 60$

(b)



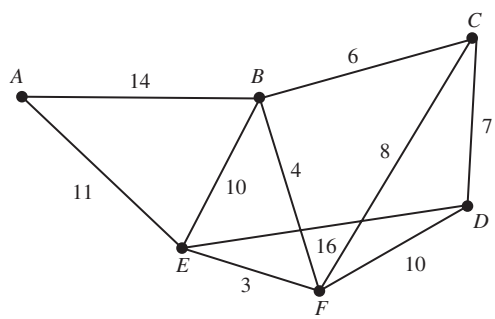
(c)



Apabila y = 100, nilai maksimum x ialah 40. Maka, keuntungan maksimum ialah
100(RM2) + 40(RM2.50) = RM 300
When y = 100*, the maximum value of x is* 40*. Thus, maximum profit is*
100(RM2) + 40(RM2.50) = RM 300

Bahagian C

16 (a) (i)



(ii) $A \to E \to F \to B \to C \to D$
11 + 3 + 4 + 6 + 7
= 31 km

(b) $(0, 0), \left(\frac{12}{60}, 5\right), \left(\frac{t}{60}, 5\right), \left(\frac{36}{60}, 14\right)$

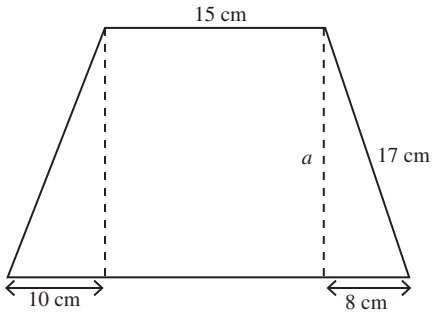
$$\frac{5}{\frac{12}{60}} = \frac{14-5}{\frac{36}{60}-\frac{t}{60}}$$

$$\frac{36}{60}-\frac{t}{60} = 0.36$$

$$\frac{t}{60} = \frac{6}{25}$$

$$t = 14.4$$

(c)



$a = \sqrt{17^2 - 8^2}$

$= 15$

Luas trapezium/*Area of trapezium*

$= 0.5(15 + 10 + 15 + 8)(15)$

$= 360 \text{ cm}^2$

Luas imej $= k^2 \times$ Luas objek

Area of image $= k^2 \times$ *Area of object*

$= 30^2 \times 360 \text{ cm}^2$

$= 324\,000 \text{ cm}^2$

(d) Pelaburan *A*

Investment A

$I = Prt$

$= \text{RM}20\,000 \times 0.05 \times 6$

$= \text{RM}6\,000$

Jumlah/*Total*

$= \text{RM}6\,000 + \text{RM}20\,000$

$= \text{RM}26\,000$

Pelaburan *B*

Investment B

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

$$= \text{RM}20\,000\left(1 + \frac{0.05}{2}\right)^{2(6)}$$

$= \text{RM}26\,897.78$

Pelaburan *B* adalah lebih menguntungkan.

Investment B is more profitable.

17 (a) $2\pi r$

$$= 2 \times \frac{22}{7} \times \frac{x}{2}$$

$$2 \times \frac{22}{7} \times \frac{x}{2} \times 20 + 2(5x) + 2(4x) = 646\frac{6}{7} \text{ cm}$$

$$62\frac{6}{7}x + 10x + 8x = 646\frac{6}{7} \text{ cm}$$

$$80\frac{6}{7}x = 646\frac{6}{7} \text{ cm}$$

$x = 8 \text{ cm}$

(b) $T \propto \frac{V}{m}$

$$T = \frac{kV}{m}$$

$$95\ ^\circ\text{C} = \frac{200k}{60}$$

$$k = 28.5$$

$$T = \frac{28.5V}{m}$$

Apabila $T = 30$ / *When* $T = 30$,

$$30 = \frac{28.5(200)}{m}$$

$m = 190$

= 3 jam dan 10 minit/3 *hours and* 10 *minutes*

Pada pukul 11.10 a.m., suhu minumannya menjadi 30 °C.

At 11.10 a.m., *temperature of her drink becomes* 30 °C.

(c) (i) $\{(V, K), (V, C), (S, K), (S, C), (M, K), (M, C)\}$

(ii) $\{(V, C), (S, C), (M, C)\}$

Kebarangkalian/*Probability*

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

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

$$126 \times \frac{3}{7+3} = 38.4$$

40 peket minuman coklat adalah mencukupi.

40 *packets of chocolate drink is enough.*

(d) (i)

Jenis kek ***Type of cake***	**Bilangan kek dibeli** ***Number of cakes bought***	**Harga sebelum cukai (RM)** ***Price before tax*** **(RM)**	**Cukai jualan dicaj (RM)** ***Sales tax charged*** **(RM)**
Vanilla	5	85	5.10
Strawberry	8	y	9.12
Matcha	6	108	z

$$\frac{x}{x+8+6} \times 360 = 94.74°$$

$$\frac{x}{x+8+6} = 0.2632$$

$$x = 0.2632x + 3.6848$$

$$0.7368x = 3.6848$$

$$x = 5$$

(ii) $0.06y = 9.12$

$y = 152$

$z = 108 \times 0.06$

$= 6.48$

Jumlah bayaran/*Total payment*

$= (85 + 152 + 108) \times 1.06$

$= \text{RM } 365.70$