Penyelesaian Lengkap

SET 3

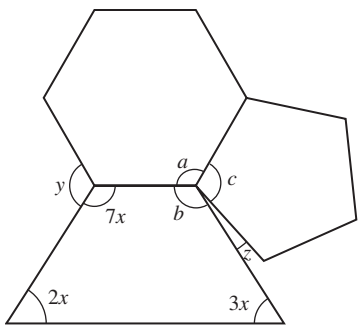
KERTAS 1

1 A
$0.0052527 \times 0.052527$
$= 2.76 \times 10^{-4}$

2 B
537_9
5×9^2
$= 405$

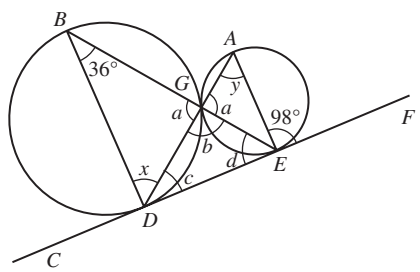
3 B
12_8
$= 1(8^1) + 2(8^0)$
$= 10$
1001_2
$= 1(2^3) + 1$
$= 9$
11_5
$= 1(5^1) + 1$
$= 6$
Min/*Mean*
$= \frac{10 + 9 + 6}{3}$
$= 8.33$

4 B
$2x + 7x = 180°$
$9x = 180°$
$x = 20°$



$a = \frac{(6-2)180°}{6}$
$= 120°$
$b = 180° - 3(20°)$
$= 120°$
$c = \frac{(5-2)180°}{5}$
$= 108°$
$z = 360° - 120° - 120° - 108°$
$= 12°$
$y = 360° - 120° - 7(20°)$
$= 100°$
$y + z = 112°$

5 A



Sudut antara tangen dan sisi segi tiga adalah sama dengan sudut dalam yang bertentangan.
The angle between the tangent and the side of the triangle is equal to the interior opposite angle.
$a = 98°$
$b = 180° - 98°$
$= 82°$
$c = 36°$
$x = 180° - 36° - 98°$
$= 46°$
$d = y = 180° - 82° - 36°$
$= 62°$
Perbezaan/*Difference*
$= 62° - 46°$
$= 16°$

6 A

7 C
$y + 3 = 6$
$y = 3$
$6x - 3 = 9$
$6x = 12$
$x = 2$

8 D

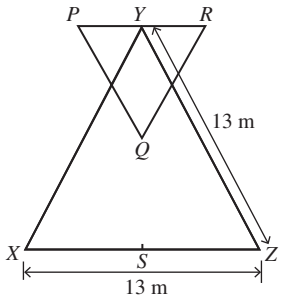
9 A
$f(x) = x^2 - 10x + 24$
$x^2 - 10x + 24 = 0$
$(x - 4)(x - 6) = 0$
$x = 4$ atau/*or* $x = 6$
Apabila $x = 5$/*When* $x = 5$,
$f(x) = 5^2 - 10(5) + 24$
$= -1$
Titik minimum ialah $(5, -1)$.
The minimum point is $(5, -1)$.

10 B
$\frac{7r^4}{6s^{0.5}} \times \frac{2r\sqrt{s^3}}{r^2}$
$= \frac{7r^{4+1-2}s^{1.5-0.5}}{3}$
$= \frac{7r^3s}{3}$

11 D
$800 \text{ cm} \times 600 \text{ cm} \times 400 \text{ cm}$
$= 192\,000\,000 \text{ cm}^3$
$= 192\,000\ \ell$
$192\,000\ \ell \times 0.8$
$= 153\,600\ \ell$
20 liter/*litre* → 1 minit/*minute*
153 600 /liter/*litres* $\rightarrow \frac{1}{20} \times 153\,600$
$= 7\,680$ minit/*minutes*
$= 128$ jam /*hours*
$= 5$ hari dan 8 jam/5 days and 8 hoursaaaa

Air dalam kolam akan tinggal 20% pada 25th November 2023 9 p.m.
The water in the pond will left 20% *by* 25th *November* 2023 9 p.m.

12 D



$PY : XZ = 1 : 4$

$$\frac{PY}{XZ} = \frac{1}{4}$$

$$\frac{PY}{10} = \frac{1}{4}$$

$$PY = 2.5$$

Maka/*Hence*, $PR = 5$ cm.

$$SY = \sqrt{13^2 - 5^2}$$
$$= 12 \text{ cm}$$

Maka/*Hence*, $YQ = 6$ cm

Area of triangle PQR
$= 0.5(6)(5)$
$= 15$
Area of triangle XYZ
$= 0.5(10)(12)$
$= 60$
Nisbah / *Ratio*
$= 15 : 60$
$= 1 : 4$

13 A
$$m^3 = \frac{mn}{n^4}$$

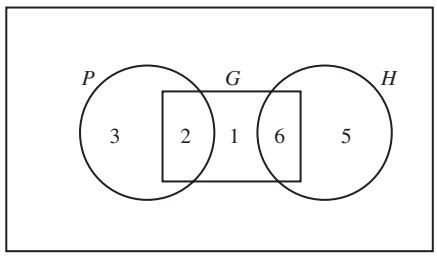
$$\frac{m^3}{m} = \frac{n}{n^4}$$

$$m^2 = \frac{1}{n^3}$$

$$m = \sqrt{\frac{1}{n^3}}$$

14 A

15 D



$n(G') = n(P' \cap H)$
$3 + 5 + x = 11$
$x = 3$
$n(\xi) = 3 + 2 + 1 + 6 + 5 + 3$
$= 20$

16 D

17 C $90 + 80 + 60 + 70 + 60 + 30$
$= 390$

18 B $2x + y = 60$ ...(1)
$3x + y = 65$ ...(2)
(2) – (1):
$x = 5$
$y = 50$

$$x = \frac{y}{10}$$

19 A $x > 1.2y$

$$x > \frac{6y}{5}$$

$5x > 6y$

20 B $2y - 3x = 6$
$2y = 3x + 6$

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

$$y = \frac{3}{2}x + c$$

Di/*At* $(3, 5)$

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

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

$$y = \frac{3}{2}x + \frac{1}{2}$$

$2y = 3x + 1$

21 D
$$3m - \frac{6m + 5}{0.2} = m + 1$$

$$3m - \frac{10(6m + 5)}{2} = m + 1$$

$$\frac{6m - 60m - 50}{2} = m + 1$$

$$-54m - 50 = 2m + 2$$

$$56m = -52$$

$$m = \frac{-13}{14}$$

22 C
$$\frac{m + k}{k^2 - m^2} \div \frac{k^2 + m^2 + 2km}{k - m}$$

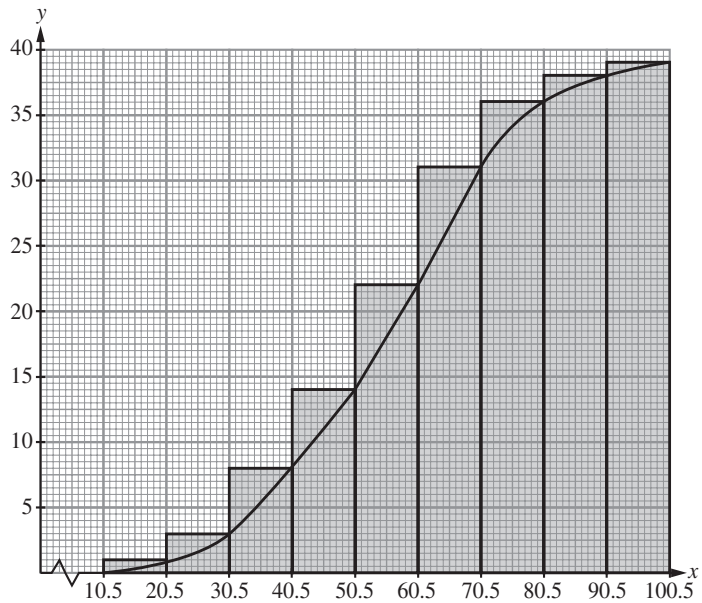
$$= \frac{m + k}{(k - m)(k + m)} \times \frac{k - m}{(k + m)(k + m)}$$

$$= \frac{1}{(k + m)^2}$$

23 C
$$\frac{5}{15} \times 100\% = 33.33\%$$

24 C
$$\frac{158 \times 29 + 174 \times 5}{25} = 162$$

25 B



26 B $x + 10 + 2x + 12 + 15 = 64$
$x = 9$

Skor/*Score*	1	2	3	4	5
Bilangan murid ***Number of pupils***	9	10	18	12	15
Kekerapan longgokan ***Cumulative frequency***	9	19	37	49	64

Median = cerapan ke-$\left(\frac{64}{2}\right)$
= cerapan ke-32
= 3

Median $= \left(\frac{64}{2}\right)^{\text{th}}$ *observation*

$= 32^{\text{th}}$ *observation*

$= 3$

27 A $(0, 30)\ (t, v)$

$$\frac{30 - v}{0 - t} = -6$$

$$30 - v - 6t = 0$$

$$v + 6t = 30 \quad ...(1)$$

$(t, v)(15, 0)$

$$\frac{v - 0}{t - 15} = -1$$

$$v = -t + 15$$

$$v + t = 15 \quad ...(2)$$

$(1) - (2)$

$$5t = 15$$

$$t = 3$$

$$v = 12$$

28 D $0.4 \times 60 \text{ km j}^{-1} = 24\text{km j}^{-1}$

$0.4 \times 60 \text{ km h}^{-1} = 24 \text{ km h}^{-1}$

$$\frac{60 - 24}{\frac{5}{60}} = 432 \text{ km min}^{-1}$$

29 D

30 B $\frac{72}{81} \times \frac{71}{80} \times \frac{70}{79} = 0.699$

31 C $X \propto \frac{Z}{Y^3}$

$$X = \frac{kZ}{Y^3}$$

$$25 = \frac{k(4)}{8}$$

$$k = 50$$

$$X = \frac{50Z}{Y^3}$$

$$X = \frac{50(2Z)}{(0.5Y)^3}$$

$$= \frac{800Z}{Y^3}$$

$$\frac{\frac{800Z}{Y^3} - \frac{50Z}{Y^3}}{\frac{50Z}{Y^3}} \times 100\%$$

$= 1\,500\%$

32 A $p \propto \frac{1}{q^2}$

$pq^2 = k$

33 D Peringkat matriks X ialah 2×2.
The order of matrix X is 2×2.

34 B $\begin{pmatrix} 1 & 6 \\ 7 & 2 \end{pmatrix}\begin{pmatrix} r \\ 3 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix}$

$$r + 18 = y$$

$$7r + 6 = y$$

$$r + 18 = 7r + 6$$

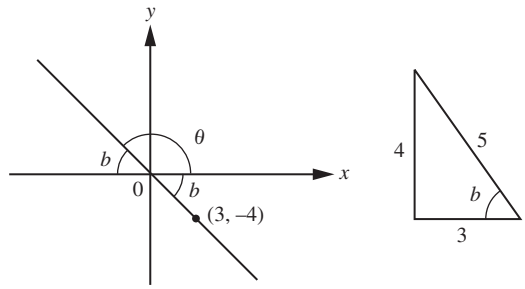
$$6r = 12$$

$$r = 2$$

$$y = 20$$

35 C

36 D



kos θ

$= -\text{kos } b$

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

37 D Faedah untuk 2 tahun/*Interest for* 2 *years*

$= \text{RM5 000} \times 0.05 \times 2$

$= \text{RM 500}$

Bayaran ansuran bulanan/*Monthly instalment*

$= \frac{\text{RM5 500}}{24}$

$= \text{RM229.17}$

38 B

39 D Cukai tanah/*Quit rent*

$= \text{RM0.48} \times 14 \times 15$

$= \text{RM100.80}$

40 B

KERTAS 2

Bahagian A

1 Bilangan pokok durian/*Number of durian tree*

$= 0.6 \times 120$

$= 72$

Bilangan pokok mangga/*Number of mango tree*

$= 120_3$

$= 1(3^2) + 2(3^1)$

$= 15$

Bilangan pokok pisang/Number of banana tree

$= 120 - 72 - 15$

$= 33$

		Baki/*Remaining*
2	33	
2	16	— 1
2	8	— 0
2	4	— 0
2	2	— 0
2	1	— 0
	0	— 1

Terdapat 100001_2 pokok pisang.
There are 100001_2 *banana trees.*

2 $(38\,000 - 800)\frac{y}{100} + 800 = 8\,240$

$$37\,2y = 7\,440$$

$$y = 20$$

$$z = 100 - 20$$

$$= 80$$

$$(x - 800)0.2 + 800 = 2\,440$$

$$(x - 800)0.2 = 1\,640$$

$$x - 800 = 8\,200$$

$$x = 9\,000$$

Maka/*Thus*, $x = 9\,000$, $y = 20$, $z = 80$.

3 $f(x) = ax^2 + bx + c$

$f(x) = ax^2 + bx + 6$

Di/*At* $(-1, 8)$,

$$8 = a - b + 6$$

$$a - b = 8 - 6$$

$$a - b = 2 \quad ...(1)$$

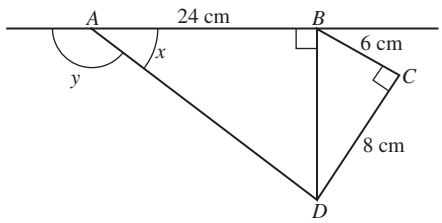
Paksi simetri ialah $x = -1$
Axis of symmetry is $x = -1$

$$-1 = \frac{-b}{2a}$$
$$-2a = -b$$
$$b = 2a \quad ...(2)$$

(2)→ (1): $a - 2a = 2$
$-a = 2$
$a = -2$
$b = -4$

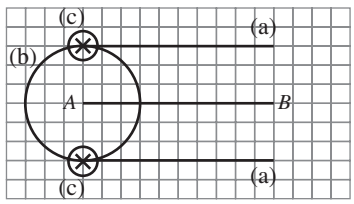
Maka/*Thus*, $f(x) = -2x^2 - 4x + 6$.

4 $BD = \sqrt{6^2 + 8^2}$
$= 10$
$AD = \sqrt{10^2 + 24^2}$
$= 26$



$\cos y + \sin y$
$= -\cos x + \sin x$
$= -\frac{24}{26} + \frac{10}{26}$
$= -\frac{14}{26}$
$= -\frac{7}{13}$

5



6 (a) (–5, 6) (5, –6)

$$y = \frac{6 - (-6)}{-5 - 5}x$$
$$y = \frac{6}{-5}x$$

(b) $y = 0.6x + c$
Di/*At* (5, –6),
$-6 = 0.6(5) + c$
$c = -9$
$y = 0.6x - 9$
Apabila/*When* $y = 0$,
$0.6x - 9 = 0$
$x = 15$

7 (a) *K* ialah 270° putaran lawan jam pada pusat (2, 1).
K is a rotation 270° *anticlockwise at centre* (2, 1).
J ialah pantulan pada garis lurus $x = 1$.
J is a reflection on straight line $x = 1$.

8 (a) (i) 1 boleh ditulis sebagai hasil darab tiga nombor yang sama.
1 *can be written as a product of three identical numbers.*
(ii) Bentuk I
Form I

(b) Jika gandaan bagi *x* boleh dibahagi tepat dengan 2, maka gandaan bagi *x* boleh dibahagi tepat dengan 4.
If multiples of x are divisible by 2*, then multiples of x are divisible by* 4.
Palsu/*False*

9 $2x + 3y = 1\,404$
$5x + y = 1\,378$

$$\begin{pmatrix} 2 & 3 \\ 5 & 1 \end{pmatrix}\begin{pmatrix} y \\ x \end{pmatrix} = \begin{pmatrix} 1\,404 \\ 1\,378 \end{pmatrix}$$
$$\begin{pmatrix} y \\ x \end{pmatrix} = \frac{1}{2(1) - 5(3)}\begin{pmatrix} 1 & -3 \\ -5 & 2 \end{pmatrix}\begin{pmatrix} 1\,404 \\ 1\,378 \end{pmatrix}$$
$$= \frac{1}{-13}\begin{pmatrix} -2\,730 \\ -4\,264 \end{pmatrix}$$
$$= \begin{pmatrix} 210 \\ 328 \end{pmatrix}$$

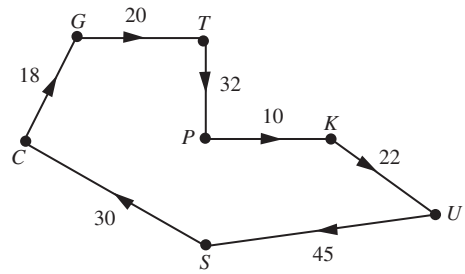
Harga bagi satu tiket penerbangan ke Bangkok dan Taiwan masing-masing ialah RM210 dan RM328.
The price of a flight ticket to Bangkok and Taiwan is RM210 *and* RM328 *respectively.*

10 (a) $f(x) = 7x^2 + bx + 2$
Di/*At* (3, 77),
$77 = 7(32) + 3b + 2$
$3b = 12$
$b = 4$
$f(x) = 7x^2 + 4x + 2$

(b) $g(x) = 7x^2 - 4x + 2$

Bahagian B

11 (a) (i)

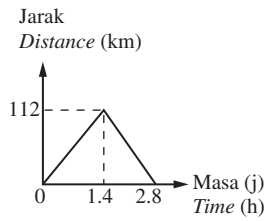


(ii) Graf di atas bukan sebuah pokok sebab sebuah pokok harus mempunyai *n* bucu dan $n - 1$ tepi tetapi graf di atas mempunyai 7 bucu dan 7 tepi.
The graph above is not a tree because a tree should have n vertices and $n - 1$ *edges but the graph above has* 7 *vertices and* 7 *edges.*

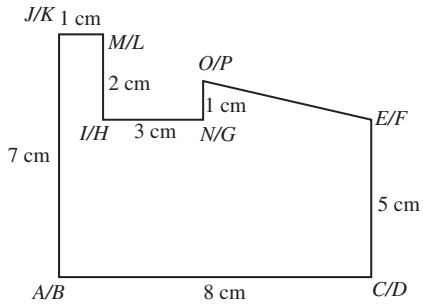
(b) Masa yang diambil untuk bergerak dari destinasi *G* ke *U* ialah $20 + 32 + 10 + 22 = 84$ minit, iaitu $\frac{84}{60} = 1.4$ jam.
Time taken to move from destination G to U is $20 + 32 + 10 + 22 = 84$ *minutes, that is* $\frac{84}{60} = 1.4$ hours.

$$\text{Laju purata} = \frac{\text{Jarak}}{\text{Masa}}$$
$$80 \text{ km j}^{-1} = \frac{\text{Jarak}}{1.4}$$
Jarak = 112 km

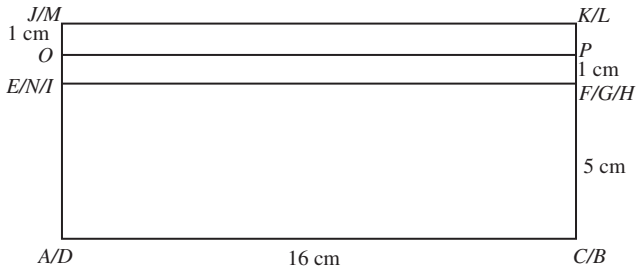
$$\textit{Average speed} = \frac{\textit{Distance}}{\textit{Time}}$$
$$80 \text{ km h}^{-1} = \frac{\textit{Distance}}{1.4}$$
Distance = 112 km



12 (a)



(b)



13 (a) (i) *F* ialah pembesaran dengan faktor skala 0.5 pada pusat (6, 6).
F is an enlargement with scale factor 0.5 *at centre* (6, 6).

(ii) *G* ialah pembesaran dengan faktor skala 4 pada pusat (–2, –6).
G is an enlargement with scale factor 4 *at centre* (–2, –6).

(b) Luas imej = $k^2 \times$ Luas objek
$288 = 4^2 \times$ Luas A
Luas $A = 18$ unit^2

Area of image = $k^2 \times$ *Area of objek*
$288 = 4^2 \times$ *Area of A*
Area of A = 18 unit^2

Luas imej = $k^2 \times$ Luas objek
Luas $A'' = 0.5^2 \times 288$
Luas $A'' = 72$ unit^2

Area of image = $k^2 \times$ *Area of object*
Area of A$'' = 0.5^2 \times 288$
Area of A$'' = 72$ unit^2

Luas kawasan berlorek/*Area of shaded region*
= 288 – 18 – 72
= 198 unit^2

14 (a) Luas/*Area*, $f(x) = 0.5(3x + x)2x - 0.5x(1.5x)$
$f(x) = 0.5(4x)(2x) - 0.75x^2$

$$= \frac{13x^2}{4}$$

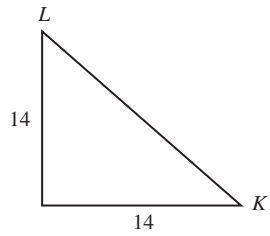
(b) $\frac{13x^2}{4} = 159.25$

$x^2 = \frac{637}{13}$

$x^2 = 49$

$x = 7$

(c)



$LK = \sqrt{14^2 + 14^2}$
$= 19.80$ m

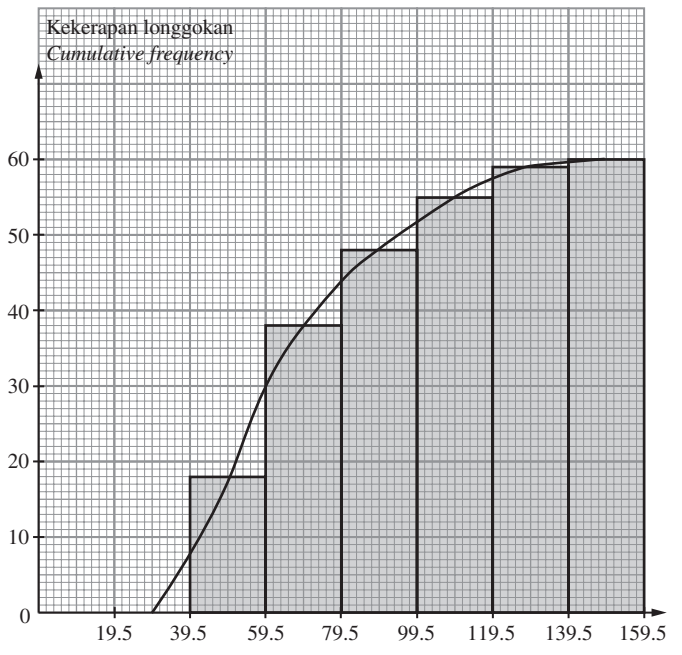
Perimeter
= 7 + 14 + 21 + 19.80
= 61.8 m

15 (a)

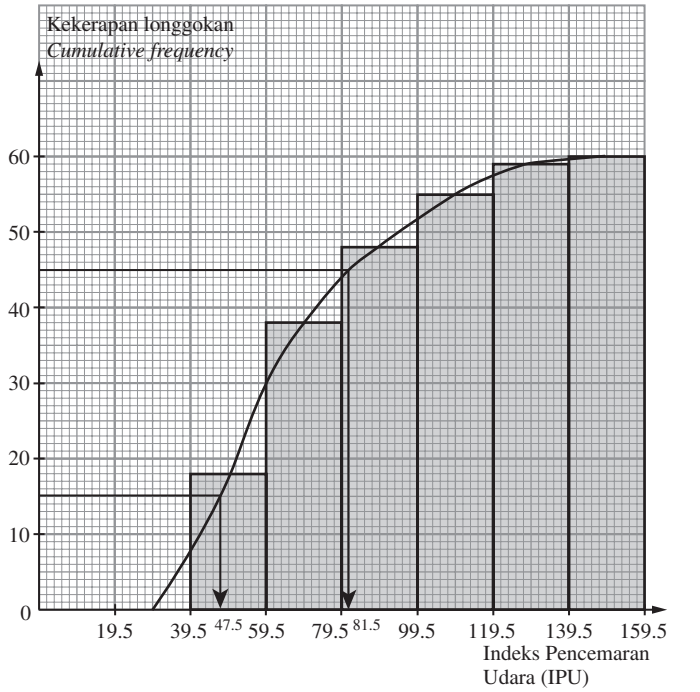
Indeks pencemaran udara (IPU) ***Air pollution index (API)***	**Kekerapan longgokan** ***Cumulative frequency***	**Sempadan atas** ***Upper boundary***
40 – 59	18	59.5
60 – 79	38	79.5
80 – 99	48	99.5
100 – 119	55	119.5
120 – 139	59	139.5
140 – 159	60	159.5

Jadual 2
Table 2

(b)



(c)



Julat antara kuartil $= Q_3 - Q_1$

$Q_3 =$ cerapan ke $- \frac{3}{4}(60)$

$=$ cerapan ke-45

$= 81.5$

$Q_1 =$ cerapan ke $- \frac{1}{4}(60)$

$=$ cerapan ke-15

$= 47.5$

Julat antara kuartil

$= 81.5 - 47.5$

$= 34$

Interquartile range $= Q_3 - Q_1$

$Q_3 = [\frac{3}{4}(60)]^{\text{th}}$ *observation*

$= 45^{\text{th}}$ *observation*

$= 81.5$

$Q_3 = [\frac{1}{4}(60)]^{\text{th}}$ *observation*

$= 15^{\text{th}}$ *observation*

$= 47.5$

Interquartile range

$= 81.5 - 47.5$

$= 34$

Bahagian C

16 (a) $\frac{8}{13}100(2x) = 2\,500$

$x = 20.31$ cm

(b) Ya, ia merupakan teselasi sebab bentuk berulang memenuhi keseluruhan kain tanpa ruang kosong atau pertindihan.
Yes, it is a tessellation because the recurring pattern fills the whole cloth without leaving empty spaces or overlapping.

(c) (i) $10 + (n-1)30$

$= 10 + 30n - 30$

$= 30n - 20$

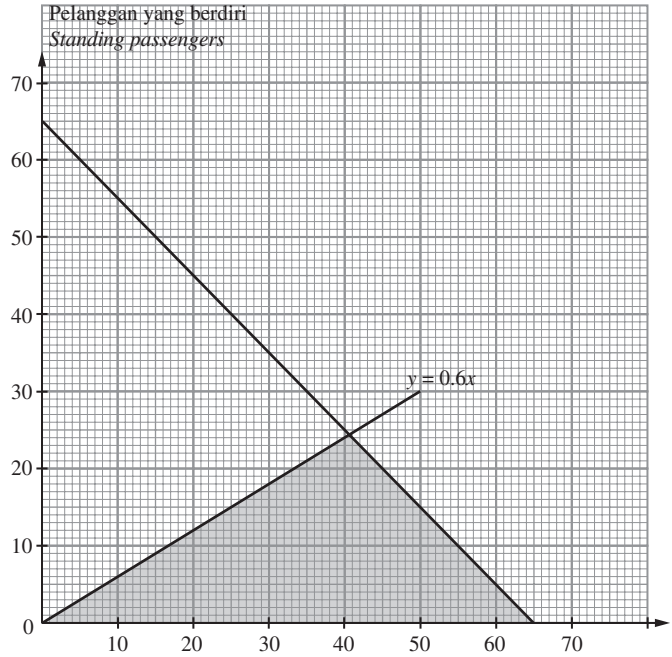
$30n - 20$, di mana $n = 1, 2, 3, ...$

$30n - 20$, *where* $n = 1, 2, 3, ...$

(ii) Ketinggian tiga tingkat ialah $240 \text{ cm} \times 3 = 720$ cm.
Height of three floors is $240 \text{ cm} \times 3 = 720$ cm.
Panjang maksimum tali dan menthol lampu ialah 520 cm.
Maximum length of thread and light bulb is 520 cm.
When $n = 17$,
$30n - 20 = 490$ cm
$490 \text{ cm} + 16 \text{ cm} = 506$ cm

(d) $x + y \leq 65$

$y \leq 0.6x$



17 (a) Jonathan telah mengaplikasi konsep SMART.
Khusus – Membeli sebuah kereta bernilai RM110 000.
Boleh diukur – Membayar wang pendahuluan sebanyak $0.2 \times 110\,000 = \text{RM}22\,000$
Boleh dicapai – Wang pendahuluan sebanyak RM22 000 boleh disimpan dalam masa dua tahun. Dia hanya perlu simpan RM11 000 setahun.
Realistik – Simpanan bulanan sebanyak $\frac{\text{RM}11\,000}{12} =$ RM916.67 hanya merupakan $\frac{\text{RM}916.67}{\text{RM}8\,500} \times 100 = 10.78\%$ daripada gajinya.
Kekangan masa – Dalam masa 2 tahun.
Jonathan did use the SMART approach.
Specific – Buy a car worth RM110 000.
Measurable – Pay a downpayment of $0.2 \times 110\,000 = \text{RM}22\,000$
Attainable – By saving RM22 000 *in two years time, he only need to save* RM11 000 *a year.*
Realistic – Monthly saving of $\frac{\text{RM}11\,000}{12} = \text{RM}916.67$ *is only* $\frac{\text{RM}916.67}{\text{RM}8\,500} \times 100 = 10.78\%$ *of his income.*
Time-bound – Within 2 *years.*

(b) $0.8 \times \text{RM}110\,000 = \text{RM}88\,000$

$\text{RM}88\,000 \times 0.045 \times 7 = \text{RM}27\,720$

$\frac{\text{RM}88\,000 + \text{RM}27\,720}{7 \times 12} = \text{RM}1\,377.62$

(c) $\text{RM}279.60 - \text{RM}200 = \text{RM}79.60$

$\frac{\text{RM}79.60}{\text{RM}0.4} = 199$

1 600 cc + 199 cc = 1 799 cc

(d) Jumlah jarak dilalui/*Total distance travelled* = 21.17 km

$0.5(50)\left(\frac{t}{60}\right) + 0.5(60+50)\left(\frac{3t+1-t}{60}\right) = 21.17$

$0.5(50)\left(\frac{t}{60}\right) + 0.5(60+50)\left(\frac{2t+1}{60}\right) = 21.17$

$\frac{5t}{12} + \frac{22t+11}{12} = 21.17$

$27t + 11 = 254.04$

$t = 9$

$3t + 1$

$= 3(9) + 1$

$= 28$