

14 A

15 D Katakan/Let $x = n[P \cup G \cup H]$.

$$n(G') = n(P' \cap H)$$

$$3 + 5 + x = 11$$

$$x = 3$$

$$n(\xi) = 3 + 2 + 1 + 6 + 5 + 3 \\ = 20$$

16 D

17 C Laluan terpanjang/Longest path:

$$E \rightarrow F \rightarrow G \rightarrow B \rightarrow A \rightarrow D \rightarrow C$$

Jarak terpanjang/Longest distance

$$= 90 + 80 + 60 + 70 + 60 + 30$$

$$= 390 \text{ km}$$

18 B

$$2x + y = 60 \quad \dots(1)$$

$$3x + y = 65 \quad \dots(2)$$

$$(2) - (1):$$

$$x = 5$$

$$y = 50$$

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

19 A

$$x > 1.2y$$

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

$$5x > 6y$$

20 B

$$2y - 3x = 6$$

$$2y = 3x + 6$$

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

Katakan persamaan garis BK ialah $y = \frac{3}{2}x + c$.

Let the equation of line BK be $y = \frac{3}{2}x + c$.

Di titik/At the point (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

$$\frac{159 \times 20 + 174 \times 5}{25} = 162$$

25 B

$$26 \text{ B } x + 10 + 2x + 12 + 15 = 64 \\ x = 9$$

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- $\left(\frac{64}{2}\right)$

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

= cerapan ke-32

32th observation

$$= 3$$

27 A

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

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

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

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

$$v = -t + 15$$

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

(1) - (2):

$$5t = 15$$

$$t = 3$$

$$v = 12$$

28 B

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

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

Nyahpecutan

Deceleration

$$\frac{(60-24) \text{ km}}{60 \text{ min}}$$

$$= \frac{5}{60} \text{ min}$$

$$= 7.2 \text{ km min}^{-2}$$

29 D

30 B

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

31 C

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

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

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

$$k = 50$$

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

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

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

Peratusan perubahan

Percentage of change

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

$$= 1500\%$$

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 $\begin{bmatrix} 1 & 6 \\ 7 & 2 \end{bmatrix} \begin{bmatrix} r \\ 3 \end{bmatrix} = \begin{bmatrix} y \\ y \end{bmatrix}$

$\begin{bmatrix} r+18 \\ 7r+6 \end{bmatrix} = \begin{bmatrix} y \\ y \end{bmatrix}$

$r+18 = y \quad \dots(1)$

$7r+6 = y \quad \dots(2)$

(1) = (2):

$r+18 = 7r+6$

$6r = 12$

$r = 2$

Gantikan $r = 2$ ke dalam (1):

Substitute $r = 2$ into (1):

$y = 2 + 18$

$= 20$

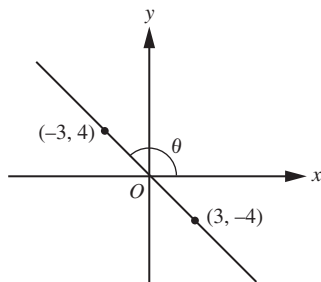
35 C Tempoh/Period = $\frac{180^\circ}{b}$

$360^\circ = \frac{180^\circ}{b}$

$b = 2$

$\therefore y = \tan 2x$

36 D



$\cos \theta = \frac{-3}{\sqrt{(-3)^2 + 4^2}}$
 $= -\frac{3}{5}$

37 D Faedah untuk 2 tahun/Interest for 2 years

$= \text{RM}5\,000 \times 0.05 \times 2$

$= \text{RM}500$

Bayaran ansuran bulanan/Monthly instalment

$= \frac{\text{RM}5\,000 + \text{RM}500}{24}$

$= \text{RM}229.17$

38 B

39 D Cukai tanah/Quit rent

$= \text{RM}0.48 \times 14 \times 15$

$= \text{RM}100.80$

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
2	0 — 1

$33 = 100001_2$

Terdapat 100001_2 pokok pisang.

There are 100001_2 banana trees.

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

$372y = 7\,440$

$y = 20$

$z = 100 - 20$

$= 80$

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

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

$x - 800 = 8\,200$

$x = 9\,000$

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

3 Katakan/Let $f(x) = ax^2 + bx + 6$.

$f(-1) = 8$

$8 = a - b + 6$

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

Paksi simetri ialah $x = -1$.

Axis of symmetry is $x = -1$.

$-1 = \frac{-b}{2a}$

$b = 2a \quad \dots(2)$

(2) - (1): $a - 2a = 2$

$-a = 2$

$a = -2$

$b = -4$

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

4 $BD = \sqrt{6^2 + 8^2}$
 $= 10 \text{ cm}$

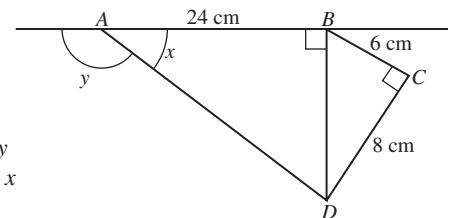
$AD = \sqrt{10^2 + 24^2}$
 $= 26 \text{ cm}$

$\cos/\cos y + \sin y$

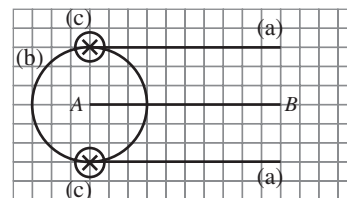
$= -\cos/\cos x + \sin x$

$= -\frac{24}{26} + \frac{10}{26}$

$= -\frac{7}{13}$



5



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

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

(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 **K** ialah 270° putaran lawan jam pada pusat (2, 1).
K is an anticlockwise 270° rotation 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 the multiples of x are divisible by 2, then the multiples of x are divisible by 4.
Palsu/False
- 9 Katakan harga bagi satu tiket penerbangan ke Bangkok dan Taiwan masing-masing ialah RM x dan RM y .
Let the price of a flight ticket to Bangkok and Taiwan be RM x and RM y respectively.

$$\begin{bmatrix} 2 & 3 \\ 5 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 1404 \\ 1378 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2 & 3 \\ 5 & 1 \end{bmatrix}^{-1} \begin{bmatrix} 1404 \\ 1378 \end{bmatrix}$$

$$= \frac{1}{2(1) - 5(3)} \begin{bmatrix} 1 & -3 \\ -5 & 2 \end{bmatrix} \begin{bmatrix} 1404 \\ 1378 \end{bmatrix}$$

$$= -\frac{1}{13} \begin{bmatrix} -2730 \\ -4264 \end{bmatrix}$$

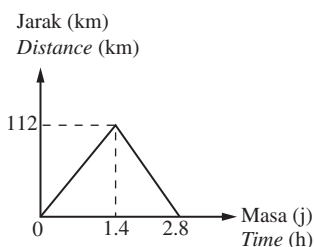
$$= \begin{bmatrix} 210 \\ 328 \end{bmatrix}$$

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.

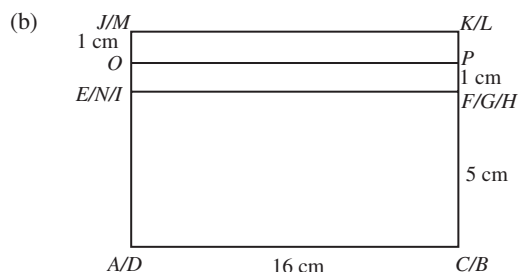
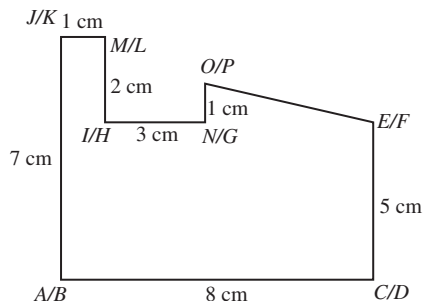
- 10 (a) $f(3) = 77$
 $77 = 7(3^2) + 3b + 2$
 $3b = 12$
 $b = 4$
 $f(x) = 7x^2 + 4x + 2$
(b) $g(x) = 7x^2 - 4x + 2$

Bahagian B

- 11 (a) (i)
-
- (ii) Graf di atas bukan sebuah pokok sebab graf di atas mempunyai 7 bucu dan 7 tepi.
The graph above is not a tree because the graph above has 7 vertices and 7 edges.
- (b) Masa yang diambil
Time taken
 $= 20 + 32 + 10 + 22$
 $= 84 \text{ minit/minutes}$
 $= 1.4 \text{ jam/hours}$
- Laju purata/Average speed = $\frac{\text{Jarak/Distance}}{\text{Masa/Time}}$
- $$80 = \frac{\text{Jarak/Distance}}{1.4}$$
- $$\text{Jarak/Distance} = 112 \text{ km}$$



12 (a)



- 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) $k^2 \times \text{Luas objek} = \text{Luas imej}$
 $k^2 \times \text{Area of objek} = \text{Area of image}$
 $4^2 \times \text{Luas/Area of A} = 288$
 $\text{Luas/Area of A} = 18 \text{ unit}^2/\text{units}^2$
 $2^2 \times \text{Luas/Area of A''} = 288$
 $\text{Luas/Area of A''} = 72 \text{ unit}^2/\text{units}^2$
Luas kawasan berlorek/Area of shaded region
 $= 288 - 18 - 72$
 $= 198 \text{ unit}^2/\text{units}^2$

14 (a) $f(x) = \frac{1}{2}(x + 3x)(2x) - (0.5x)(1.5x)$

$$= 4x^2 - \frac{3}{4}x^2$$

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

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

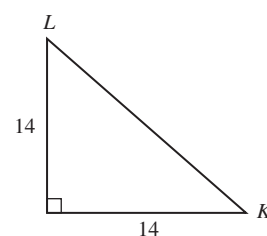
$$x^2 = 49$$

$$x = 7$$

(c) $LK = \sqrt{14^2 + 14^2}$

$$= 19.80 \text{ m}$$

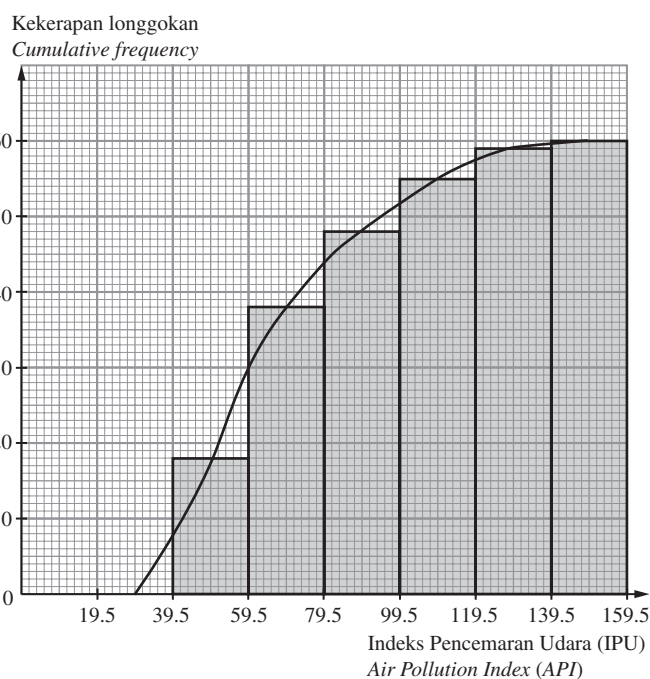
Perimeter
 $= 7 + 14 + 21 + 19.80$
 $= 61.8 \text{ m}$



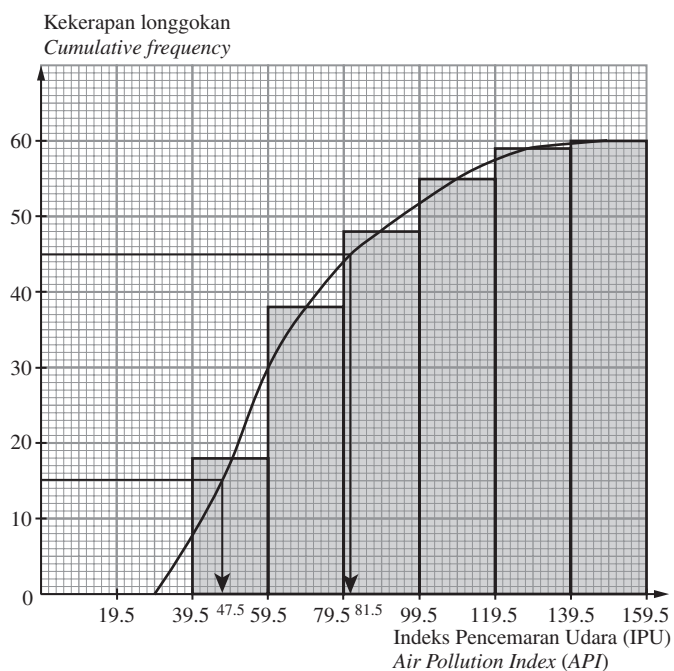
15 (a)

Indeks pencemaran udara (IPU) <i>Air pollution index (API)</i>	Kekerapan longgokan <i>Cumulative frequency</i>	Sempadan atas <i>Upper boundary</i>
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

(b)



(c)



$$Q_1 = \text{cerapan ke-} \left(\frac{1}{4} \times 60 \right)$$

$$\left(\frac{1}{4} \times 60 \right)^{\text{th}} \text{ observation}$$

$$= \text{cerapan ke-15}$$

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

$$= 47.5$$

$$Q_3 = \text{cerapan ke-} \left(\frac{3}{4} \times 60 \right)$$

$$\left(\frac{3}{4} \times 60 \right)^{\text{th}} \text{ observation}$$

$$= \text{cerapan ke-45}$$

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

$$= 81.5$$

Julat antara kuartil

Interquartile range

$$= Q_3 - Q_1$$

$$= 81.5 - 47.5$$

$$= 34$$

Bahagian C

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

$$x = 20.31 \text{ cm}$$

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

$$= 30n - 20, \text{ di mana } n = 1, 2, 3, \dots$$

$$30n - 20, \text{ where } n = 1, 2, 3, \dots$$

(ii) Ketinggian tiga tingkat ialah $240 \text{ cm} \times 3 = 720 \text{ cm}$.

$$\text{Height of three floors is } 240 \text{ cm} \times 3 = 720 \text{ cm.}$$

Panjang maksimum tali dan menthol lampu ialah 520 cm .

Maximum length of thread and light bulb is 520 cm.

Apabila/When $n = 17$,

$$30n - 20 = 490 \text{ cm}$$

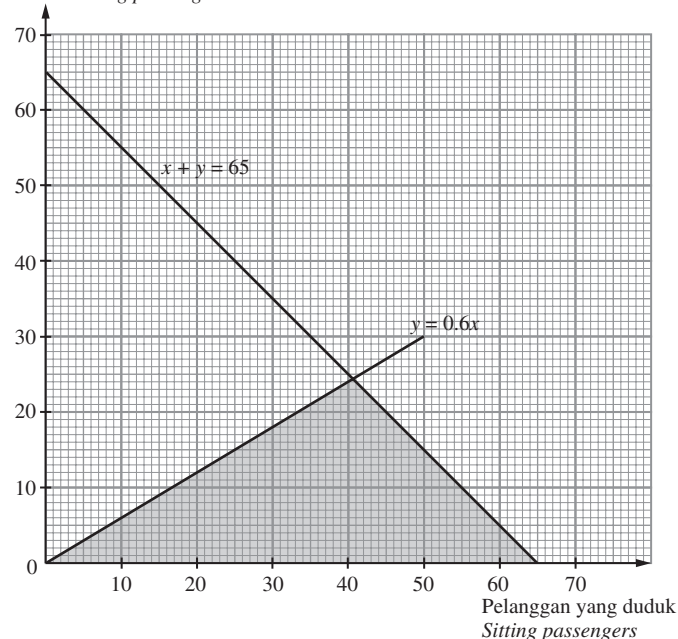
$$490 \text{ cm} + 16 \text{ cm} = 506 \text{ cm}$$

(d) $x + y \leq 65$

$$y \leq 0.6x$$

Pelanggan yang berdiri

Standing passengers



- 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 $\frac{\text{RM}11\,000}{12} = \text{RM}916.67$ 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 needs 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) Prinsipal/Principle
- $= \text{RM}110\,000 \times 0.8$
- $= \text{RM}88\,000$

Faedah/Interest

$$= \text{RM}88\,000 \times \frac{4.5}{100} \times 7$$

$$= \text{RM}27\,720$$

Ansuran bulanan

Monthly instalment

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

$$= \text{RM}1\,377.62$$

- (c) Keupayaan enjin kereta Jonathan berada dalam julat 1 601 cc hingga 1 800 cc.

The engine capacity of Jonathan's car is in the range of 1 601 cc to 1 800 cc.

Keupayaan enjin

Engine capacity

$$= 1\,600 \text{ cc} + \frac{\text{RM}279.60 - \text{RM}200}{\text{RM}0.4/\text{cc}}$$

$$= 1\,600 \text{ cc} + 199 \text{ cc}$$

$$= 1\,799 \text{ cc}$$

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

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

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

$$27t + 11 = 254.04$$

$$t = 9$$

$$3t + 1 = 3(9) + 1 = 28$$