

NOMBOR DAN OPERASI
NUMBERS AND OPERATIONS

- | | |
|--|--|
| <p>1 $a^m \times a^n = a^{m+n}$</p> <p>3 $(a^m)^n = a^{mn}$</p> <p>5 $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}} = \left(a^{\frac{1}{n}}\right)^m$</p> <p>7 Faedah mudah / <i>Simple interest</i>,
$I = Prt$</p> <p>9 Jumlah bayaran balik / <i>Total repayment</i>, $A = P + Prt$</p> <p>10 $\text{Premium} = \frac{\text{Nilai muka polisi}}{\text{RMx}} \times (\text{Kadar premium per RMx})$

 $\text{Premium} = \frac{\text{Face value of policy}}{\text{RMx}} \times (\text{Premium rate per RMx})$</p> <p>11 Jumlah insurans yang harus dibeli = $\left(\begin{array}{c} \text{Peratusan} \\ \text{ko-insurans} \end{array} \right) \times \left(\begin{array}{c} \text{Nilai boleh} \\ \text{insurans harta} \end{array} \right)$

 $\text{Amount of required insurance} = \left(\begin{array}{c} \text{Percentage of} \\ \text{co-insurance} \end{array} \right) \times \left(\begin{array}{c} \text{Insurable value} \\ \text{of property} \end{array} \right)$</p> | <p>2 $a^m \div a^n = a^{m-n}$</p> <p>4 $a^{\frac{1}{n}} = \sqrt[n]{a}$</p> <p>6 $a^{\frac{m}{n}} = \sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m$</p> <p>8 Nilai matang / <i>Maturity value</i>,
$MV = P \left(1 + \frac{r}{n}\right)^{nt}$</p> |
|--|--|

PERKAITAN DAN ALGEBRA
RELATIONSHIP AND ALGEBRA

- | | |
|---|---|
| <p>1 Jarak / <i>Distance</i> = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$</p> <p>3 Laju purata = $\frac{\text{Jumlah jarak}}{\text{Jumlah masa}}$

 $\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$</p> <p>5 $A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$</p> | <p>2 Titik tengah / <i>Midpoint</i>,
$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$</p> <p>4 $m = \frac{y_2 - y_1}{x_2 - x_1}$</p> <p>6 $m = - \frac{\text{pintasan-y}}{\text{pintasan-x}}$

 $m = - \frac{\text{y-intercept}}{\text{x-intercept}}$</p> |
|---|---|

SUKATAN DAN GEOMETRI
MEASUREMENT AND GEOMETRY

- 1 Teorem Pythagoras / *Pythagoras Theorem*, $c^2 = a^2 + b^2$
- 2 Hasil tambah sudut pedalaman poligon / *Sum of interior angles of a polygon* = $(n - 2) \times 180^\circ$
- 3 Lilitan bulatan = $\pi d = 2\pi r$
Circumference of circle = $\pi d = 2\pi r$
- 4 Luas bulatan = πr^2
Area of circle = πr^2
- 5 Panjang lengkok = $\frac{\theta}{360^\circ} \times 2\pi r$
Arc length = $\frac{\theta}{360^\circ} \times 2\pi r$
- 6 Luas sektor = $\frac{\theta}{360^\circ} \times \pi r^2$
Area of sector = $\frac{\theta}{360^\circ} \times \pi r^2$
- 7 Luas layang = $\frac{1}{2} \times$ hasil darab panjang dua pepenjuru
Area of kite = $\frac{1}{2} \times$ product of two diagonals
- 8 Luas trapezium = $\frac{1}{2} \times$ hasil tambah dua sisi selari \times tinggi
Area of trapezium = $\frac{1}{2} \times$ sum of two parallel sides \times height
- 9 Luas permukaan silinder = $2\pi r^2 + 2\pi rh$
Surface area of cylinder = $2\pi r^2 + 2\pi rh$
- 10 Luas permukaan kon = $\pi r^2 + \pi rs$
Surface area of cone = $\pi r^2 + \pi rs$
- 11 Luas permukaan sfera = $4\pi r^2$
Surface area of sphere = $4\pi r^2$
- 12 Isi padu prisma = luas keratan rentas \times tinggi
Volume of prism = area of cross section \times height
- 13 Isi padu silinder = $\pi r^2 h$
Volume of cylinder = $\pi r^2 h$

$$14 \text{ Isi padu kon} = \frac{1}{3} \pi r^2 h$$

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

$$15 \text{ Isi padu sfera} = \frac{4}{3} \pi r^3$$

$$\text{Volume of sphere} = \frac{4}{3} \pi r^3$$

$$16 \text{ Isi padu piramid} = \frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$$

$$\text{Volume of pyramid} = \frac{1}{3} \times \text{base area} \times \text{height}$$

$$17 \text{ Faktor skala, } k = \frac{PA'}{PA}$$

$$\text{Scale factor, } k = \frac{PA'}{PA}$$

$$18 \text{ Luas imej} = k^2 \times \text{luas objek}$$

$$\text{Area of image} = k^2 \times \text{area of object}$$

STATISTIK DAN KEBARANGKALIAN STATISTICS AND PROBABILITY

$$1 \text{ Min / Mean, } \bar{x} = \frac{\sum x}{N}$$

$$2 \text{ Min / Mean, } \bar{x} = \frac{\sum fx}{\sum f}$$

$$3 \text{ Varians / Variance, } \sigma^2 = \frac{\sum (x - \bar{x})^2}{N} = \frac{\sum x^2}{N} - \bar{x}^2$$

$$4 \text{ Varians / Variance, } \sigma^2 = \frac{\sum f(x - \bar{x})^2}{\sum f} = \frac{\sum fx^2}{\sum f} - \bar{x}^2$$

$$5 \text{ Sisihan piawai / Standard deviation, } \sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$$

$$6 \text{ Sisihan piawai / Standard deviation, } \sigma = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}} = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$$

$$7 \text{ } P(A) = \frac{n(A)}{n(S)}$$

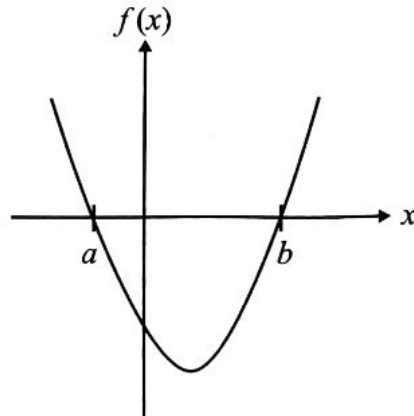
$$8 \text{ } P(A') = 1 - P(A)$$

Bahagian A
Section A

[40 markah]
[40 marks]

Jawab **semua** soalan.
Answer **all** questions.

- 1 Rajah 1 menunjukkan graf fungsi kuadratik $f(x) = x^2 - x - 6$.
Diagram 1 shows the graph of the quadratic function $f(x) = x^2 - x - 6$.



Rajah 1
Diagram 1

Berdasarkan graf fungsi kuadratik di Rajah 1,
Based on the graph of quadratic function in Diagram 1,

- (a) nyatakan persamaan paksi simetri. [1 markah]
state the equation of the axis of symmetry. [1 mark]
- (b) tentukan titik minimum atau maksimum. [2 markah]
determine the minimum or maximum point. [2 marks]

Jawapan / Answer :

(a)

(b)

- 2 (a) Nyatakan akas bagi pernyataan berikut. Seterusnya, tentukan sama ada akas tersebut benar atau palsu. [2 markah]

State the converse of the following statement. Hence, determine the converse is true or false. [2 marks]

Jika $8 - 2a < 18$, maka $2a < 6$.

If $8 - 2a < 18$, then $2a < 6$.

- (b) Tentukan sama ada hujah yang diberikan kuat atau lemah, serta meyakinkan atau tidak meyakinkan. Justifikasikan jawapan anda. [2 markah]

Determine whether the given arguments are strong or weak, and cogent or not cogent. Justify your answer. [2 marks]

Premis 1 : 10 boleh dibahagi tepat dengan 5.

Premise 1 : 10 is divisible by 5.

Premis 2 : 20 boleh dibahagi tepat dengan 5.

Premise 2 : 20 is divisible by 5.

Kesimpulan : Semua nombor genap boleh dibahagi tepat dengan 5.

Conclusion : All even numbers are divisible by 5.

Jawapan / Answer :

(a)

(b)

- 3 Jadual 1 menunjukkan tambang bas di antara beberapa tempat iaitu P , Q , R , S dan T .
 Table 1 shows bus fares between several places which are P , Q , R , S and T .

Laluan bas <i>Bus route</i>	Tambang bas (RM) <i>Bus fare (RM)</i>
P, Q	3.00
Q, R	5.00
P, R	2.50
P, S	2.30
S, T	4.20

Jadual 1

Table 1

- (a) Berdasarkan maklumat dalam Jadual 1, lengkapkan graf berpemberat dan tidak terarah di ruangan jawapan. [2 markah]
 Based on the information in Table 1, complete the weighted and undirected graph in the answer space. [2 marks]
- (b) Seterusnya, lukis satu pokok berdasarkan jawapan anda di 3(a). [1 markah]
 Hence, draw a tree based on your answer in 3(a). [1 mark]

Jawapan / Answer :

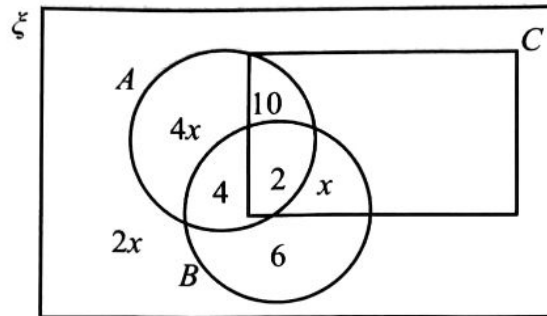
(a)



(b)

- 4 Rajah 2 ialah gambar rajah Venn yang menunjukkan bilangan unsur dalam set semesta, ξ , set A , set B dan set C .

Diagram 2 is a Venn diagram showing the number of elements in the universal set, ξ , set A , set B and set C .



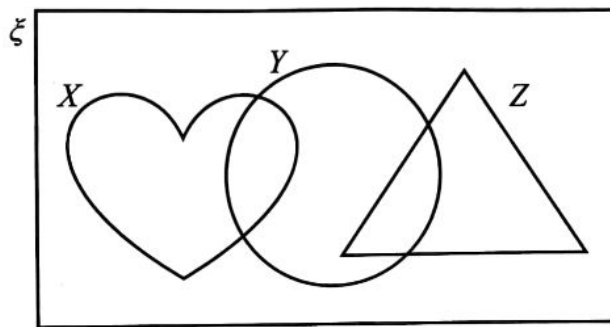
Rajah 2
Diagram 2

- (a) Diberi $n(A) = n(B \cup C)'$, cari nilai x . [2 markah]
Given $n(A) = n(B \cup C)'$, find the value of x . [2 marks]
- (b) Gambar rajah Venn di ruang jawapan menunjukkan set X , set Y dan set Z dengan keadaan set semesta, $\xi = X \cup Y \cup Z$.
Pada rajah di ruang jawapan, lorekkan set [3 markah]
The Venn diagram in the answer space shows set X , set Y and set Z such that the universal set, $\xi = X \cup Y \cup Z$.
On the diagram in the answer space, shade the set [3 marks]
- (i) $X \cup Z$,
- (ii) $X \cup (Y \cap Z)'$.

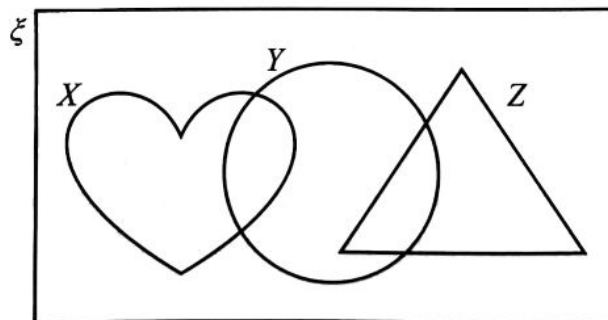
Jawapan / Answer :

(a)

(b) (i) $X \cup Z$



(ii) $X \cup (Y \cap Z)$



- 5 Encik Amsyar bekerja sebagai seorang jurutera dengan gaji bersih bulanan RM5 500. Dia juga menerima sewa bulanan rumahnya sebanyak RM500. Jadual 2 menunjukkan perbelanjaan Encik Amsyar pada bulan Disember.

Encik Amsyar works as an engineer with net monthly salary of RM5 500. He also received RM500 for his house monthly rental. Table 2 shows the expenditure of Encik Amsyar in December.

Perbelanjaan Bulan Disember <i>December Month Expenditure</i>	RM
Ansuran pinjaman perumahan <i>Housing loan instalment</i>	1 200
Ansuran kereta <i>Car instalment</i>	780
Insurans keluarga <i>Family Insurance</i>	500
Barangan dapur <i>Groceries</i>	750
Belanja petrol <i>Petrol expenses</i>	400
Bil utiliti <i>Utility bills</i>	550
Pendidikan anak-anak <i>Children's education</i>	700
Melancong <i>Travel</i>	500

Jadual 2

Table 2

Encik Amsyar ingin membeli sebuah kereta baharu yang berharga RM50 000. Dia ingin mengumpul 10% daripada harga kereta untuk membayar deposit dalam masa setengah tahun.

Bolehkah Encik Amsyar mencapai matlamat kewangannya? Justifikasikan jawapan anda.

[4 markah]

Encik Amsyar wants to buy a new car worth RM50 000. He plans to save up 10% of the car price to pay the deposit within half of the year.

Will Encik Amsyar be able to achieve his financial goal? Justify your answer.

[4 marks]

Jawapan / Answer :

- 6 Dalam suatu tinjauan untuk mengkaji hubungan antara masa dan bilangan pekerja, diperhatikan bahawa masa diperlukan, t minit, untuk mengemas meja meningkat apabila semakin ramai bilangan pelanggan, c di sebuah hotel. Walau bagaimanapun, masa tersebut didapati berkurang jika bilangan pekerja, p yang mengemas meja adalah lebih ramai.

In a survey to study the relationship between time and the number of workers, it was observed that the time required, t minutes, to set a table increases as the number of customers, c in a hotel increases. However, the time is found to be reduced if the number of workers, p who set the table is more.

Diberi 20 orang pekerja menggunakan 150 minit untuk mengemas 250 set meja yang mempunyai 8 tempat duduk.

Given 20 workers use 150 minutes to set up 250 set of tables which have 8 sittings.

- (a) Ungkapkan t dalam sebutan c dan p . [3 markah]
Express t in term of c and p . [3 marks]
- (b) Hitung bilangan pekerja yang diperlukan untuk mengemas 105 set meja dalam masa 1 jam 30 minit. [2 markah]
Calculate the number of workers needed to set up 105 table sets in 1 hour 30 minutes. [2 marks]

Jawapan / Answer :

(a)

(b)

- 7 Jadual 3 menunjukkan kadar premium tahunan bagi setiap RM1 000 nilai muka insurans sementara boleh baharu tahunan yang ditawarkan oleh Syarikat Insurans Karisma.

Table 3 shows the annual premium rate schedule per RM1 000 face value of a yearly renewable term insurance offered by Syarikat Insurans Karisma.

Umur Age	Lelaki / Male (RM)		Perempuan / Female (RM)	
	Bukan perokok Non-smoker	Perokok Smoker	Bukan perokok Non-smoker	Perokok Smoker
36	2.19	2.81	1.51	1.85
37	2.27	2.92	1.57	1.94
38	2.37	3.06	1.63	2.04
39	2.50	3.34	1.72	2.15
40	2.67	3.48	1.81	2.27

Jadual 3

Table 3

Puan Emelda berumur 38 tahun, seorang yang sihat dan tidak merokok. Beliau ingin membeli polisi insurans hayat bernilai RM180 000 daripada Syarikat Insurans Karisma. Beliau juga ingin menambah polisi penyakit kritikal. Syarikat insurans itu menawarkan polisi penyakit kritikal dengan memberikan perlindungan sebanyak 35% nilai muka asas dan kadar premium bagi setiap RM1 000 ialah RM1.75 mengikut umur dan status kesihatan Puan Emelda.

Hitung jumlah premium tahunan yang perlu dibayar oleh Puan Emelda.

[3 markah]

Puan Emelda is 38 years old, healthy and a non-smoker. She wants to buy a policy of life insurance worth RM180 000 from Syarikat Insurans Karisma. She also wants to add on a critical illness policy. The insurans company offers critical illness policy with a coverage of 35% of basic face value and the premium rate is RM1.75 per RM1 000 based on Puan Emelda's age and health status.

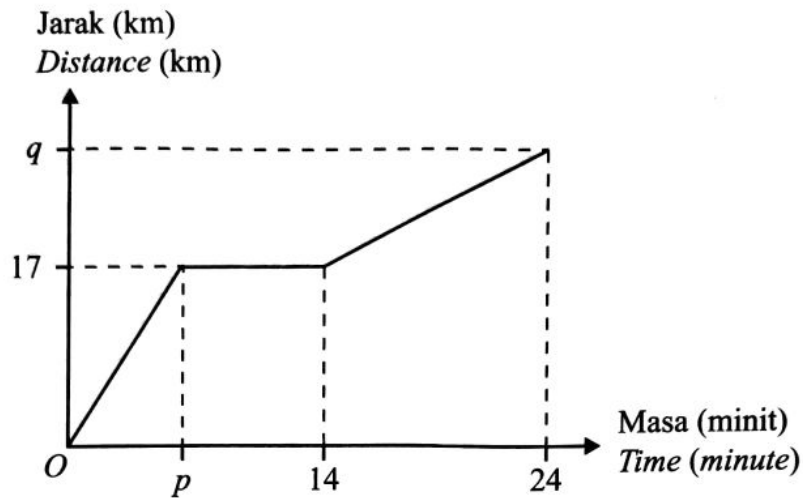
Calculate the total annual premium that Puan Emelda needs to pay.

[3 marks]

Jawapan / Answer :

- 8 Rajah 3 menunjukkan graf jarak-masa sebuah teksi dalam masa 24 minit.

Diagram 3 shows distance-time graph of a taxi in 24 minutes.



Rajah 3
Diagram 3

- (a) Nyatakan nilai p , jika teksi itu berada dalam keadaan pegun selama 6 minit. [1 markah]
State the value of p , if the taxi is stationary for 6 minutes. [1 mark]
- (b) (i) Hitung nilai q , jika laju teksi bagi 10 minit terakhir ialah 72 km h^{-1} . [2 markah]
Calculate the value of q , if the speed of the taxi for the last 10 minutes is 72 km h^{-1} . [2 marks]
- (ii) Huraikan selengkapnya gerakan teksi untuk tempoh 10 minit terakhir. [1 markah]
Describe completely the motion of the taxi for the last 10 minutes. [1 mark]

Jawapan / Answer :

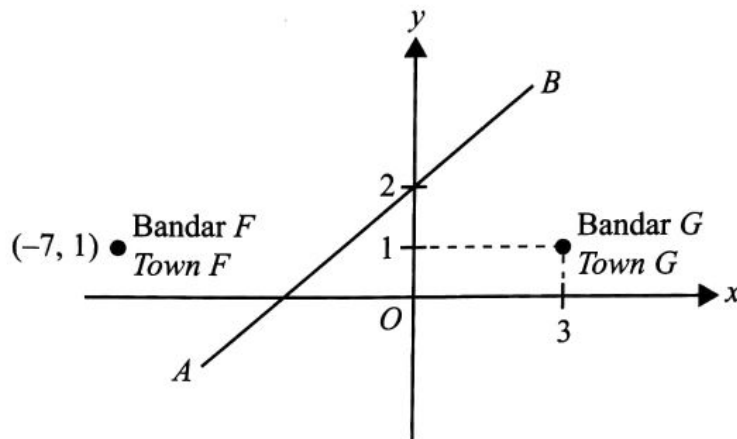
(a)

(b) (i)

(ii)

- 9 Rajah 4 menunjukkan satu jalan lurus AB . AB melalui titik tengah di antara Bandar F dan Bandar G yang dilukis pada suatu satah Cartes.

Diagram 4 shows a straight road AB . AB passes through the midpoint between Town F and Town G drawn on a Cartesian plane.



Rajah 4
Diagram 4

- (a) Tentukan koordinat titik tengah bagi Bandar F dan Bandar G . [1 markah]
Determine the coordinate of midpoint of Town F and Town G . [1 mark]
- (b) Sebatang jalan lurus KL dibina. Jalan tersebut adalah selari dengan jalan lurus AB dan melalui Bandar F . [3 markah]
Cari persamaan garis lurus yang mewakili jalan lurus KL . [3 markah]
A straight road KL is built. The road is parallel to straight road AB and passes through the Town F .
Find the equation of the straight line that represents the straight road KL . [3 marks]

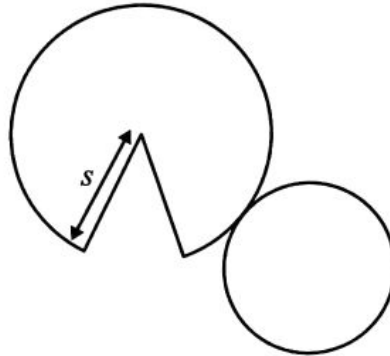
Jawapan / Answer :

(a)

(b)

- 10 (a) Rajah 5(a) menunjukkan bentangan sebuah pepejal geometri. Diberi diameter bulatan ialah 14 cm dan s ialah 25 cm.

Diagram 5(a) shows a net of a geometry solid. Given the diameter of the circle is 14 cm and s is 25 cm.



Rajah 5(a)
Diagram 5(a)

Hitung tinggi, dalam cm, pepejal geometri tersebut.

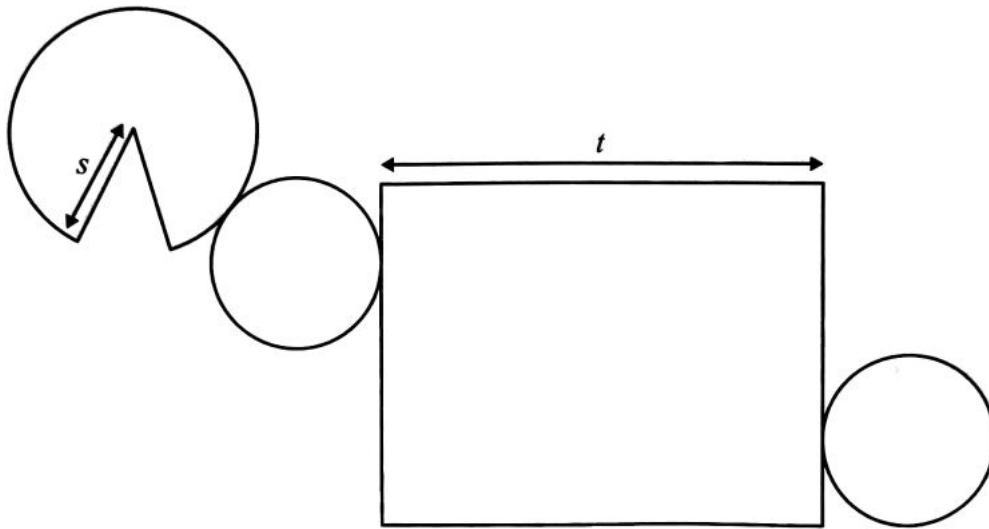
[2 markah]

Calculate the height, in cm, of the geometry solid.

[2 marks]

Jawapan / Answer :

- (b) Rajah 5(b) menunjukkan gabungan bentangan Rajah 5(a) dengan sebuah pepejal geometri yang lain. Diberi isi padu gabungan pepejal geometri tersebut ialah $4\,312\text{ cm}^3$.
 Diagram 5(b) shows the combined net of Diagram 5(a) with another geometry solid.
 Given the volume of the combined geometry solid is $4\,312\text{ cm}^3$.



Rajah 5(b)
 Diagram 5(b)

Dengan menggunakan $\pi = \frac{22}{7}$, hitung nilai t , dalam cm.

[3 markah]

By using $\pi = \frac{22}{7}$, calculate the value of t , in cm.

[3 marks]

Jawapan / Answer :

[Lihat halaman sebelah

Bahagian B
Section B

[45 markah]

[45 marks]

Jawab **semua** soalan dalam bahagian ini.

Answer all questions in this section.

- 11** Alia ke pejabat sama ada menaiki kereta api atau bas. Kebarangkalian Alia menaiki kereta api ialah $\frac{2}{5}$. Jika dia menaiki kereta api, kebarangkalian dia lewat ke pejabat ialah $\frac{1}{6}$ dan jika dia menaiki bas, kebarangkalian dia lewat ke pejabat ialah $\frac{5}{8}$.

Alia travels to office either by train or bus. The probability of Alia riding a train is $\frac{2}{5}$. If she rides a train, the probability that she is late for office is $\frac{1}{6}$ and if she travels by bus, the probability that she is late for office is $\frac{5}{8}$.

- (a) Rajah 6 di ruang jawapan menunjukkan gambar rajah pokok yang tidak lengkap. Lengkapkan gambar rajah pokok di Rajah 6. [2 markah]

Diagram 6 in the answer space shows the incomplete tree diagram.

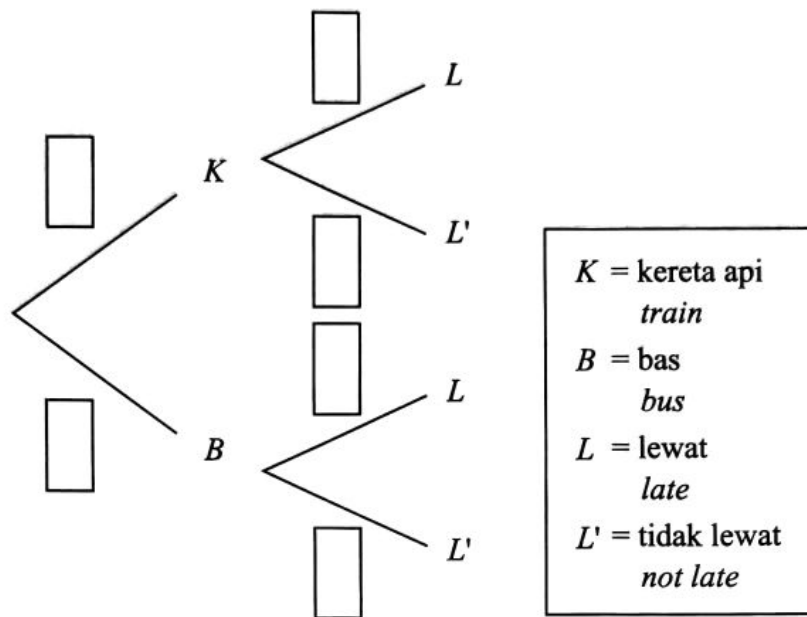
Complete the tree diagram in Diagram 6. [2 marks]

- (b) Berdasarkan Rajah 6, cari kebarangkalian bahawa
Based in the Diagram 6, find the probability that

- (i) Alia menaiki kereta api dan lewat ke pejabat. [2 markah]
Alia rides a train and late for office. [2 marks]
- (ii) Alia lewat ke pejabat. [2 markah]
Alia is late for office. [2 marks]
- (iii) Alia tidak lewat ke pejabat. [2 markah]
Alia is not late for office. [2 marks]

Jawapan / Answer :

(a)



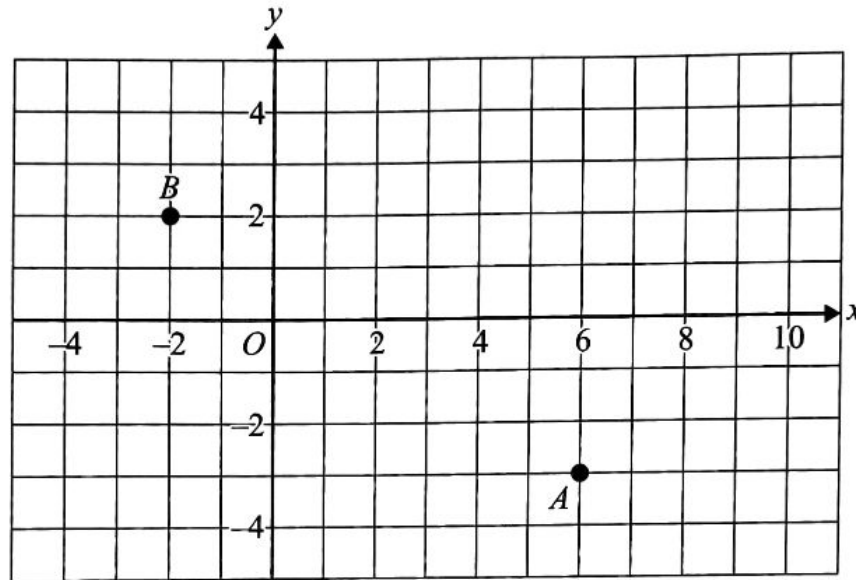
Rajah 6
Diagram 6

(b) (i)

(ii)

(iii)

- 12 (a) Rajah 7 menunjukkan dua titik, A dan B , pada suatu satah Cartes.
 Diagram 7 shows the two points, A and B , on a Cartesian plane.



Rajah 7
 Diagram 7

Transformasi **T** ialah satu translasi $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$.

Transformasi **P** ialah satu pantulan pada garis lurus $y = 1$.

Transformasi **R** ialah satu putaran 90° lawan arah jam pada pusat $(2, 1)$.

Transformation **T** is a translation $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$.

Transformation **P** is a reflection in the straight line $y = 1$.

Transformation **R** is an anticlockwise rotation of 90° about the centre $(2, 1)$.

- (i) Diberi titik $A(6, -3)$ adalah imej bagi suatu objek di bawah transformasi **T**.
Nyatakan koordinat objek tersebut. [1 markah]
*Given point $A(6, -3)$ is the image of an object under transformation **T**.
State the coordinate of the object. [1 mark]*
- (ii) Nyatakan koordinat imej bagi titik $B(-2, 2)$ di bawah transformasi berikut:
State the coordinate of the image of the point $B(-2, 2)$ under the following transformations:
P,
R.
- [2 markah]
[2 marks]

Jawapan / Answer :

(a) (i)

(ii) **P –**

R –

- (b) Rajah 8 di ruang jawapan pada halaman 25 menunjukkan sisi empat $ABCD$ dan $JKLMH$, dilukis pada satah Cartes.

Diagram 8 in the answer space on page 25 shows quadrilaterals $ABCD$ and $JKLMH$, drawn on a Cartesian plane.

$JKLMH$ ialah imej bagi $ABCD$ di bawah suatu transformasi V .

$JKLMH$ is the image of $ABCD$ under a transformation V .

- (i) Perihalkan selengkapnya transformasi V . [3 markah]
Describe in full, the transformation V . [3 marks]

- (ii) Satu imej bagi $JKLMH$ dilukis di bawah transformasi putaran 90° lawan arah jam pada pusat $(9, 5)$.

Lukiskan imej tersebut dalam Rajah 8. [1 markah]

One image of $JKLMH$ is drawn under a transformation an anticlockwise rotation of 90° about the centre $(9, 5)$.

Draw the image in Diagram 8. [1 mark]

- (iii) $EFGH$ ialah imej bagi $ABCD$ di bawah suatu transformasi W .

Berdasarkan jawapan di 12(b)(ii), perihalkan selengkapnya transformasi W .

[2 markah]

$EFGH$ is the image of $ABCD$ under a transformation W .

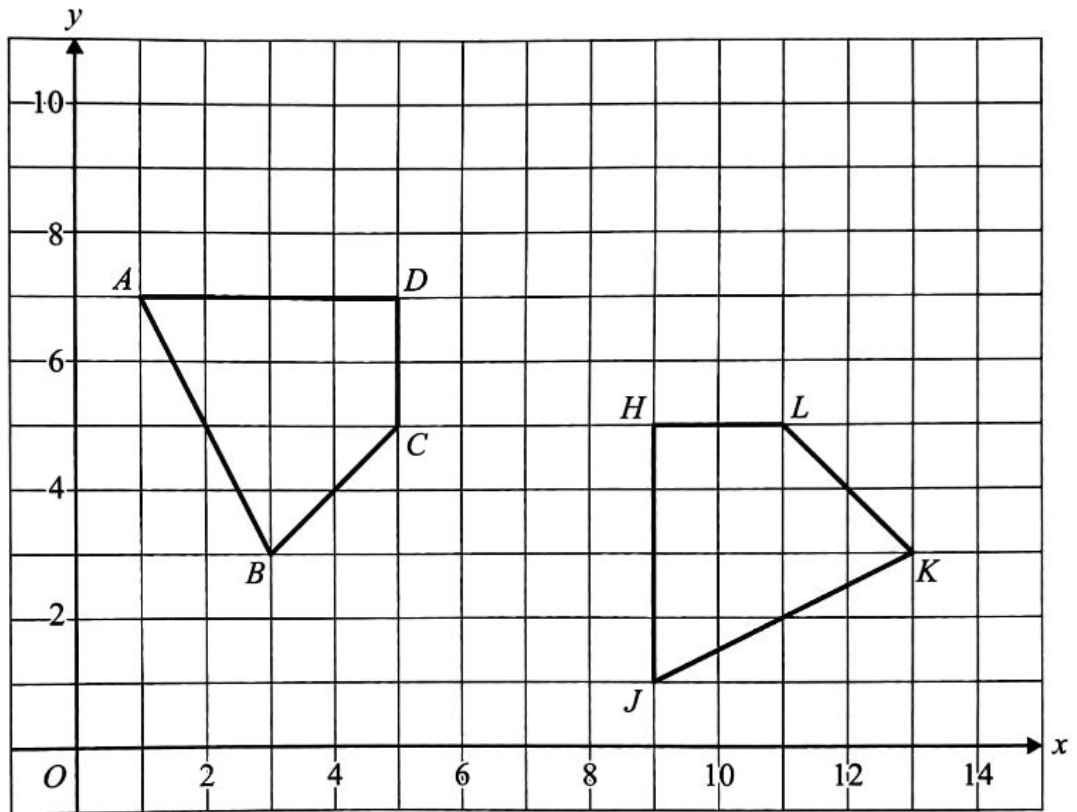
Based on the answer in 12(b)(ii), describe in full, the transformation W .

[2 marks]

Jawapan / Answer :

(b) (i) V –

(ii)



Rajah 8
Diagram 8

(iii) W –

- 13 Jadual 4 menunjukkan taburan markah bagi 40 orang murid kelas 5 Rigel dalam satu peperiksaan Matematik pada tahun 2023.

Table 4 shows the mark distribution for 40 pupils from class 5 Rigel in a Mathematics exam in year 2023.

Markah Marks	Kekerapan Frequency
11 – 25	1
26 – 40	3
41 – 55	8
56 – 70	13
71 – 85	9
86 – 100	6

Jadual 4

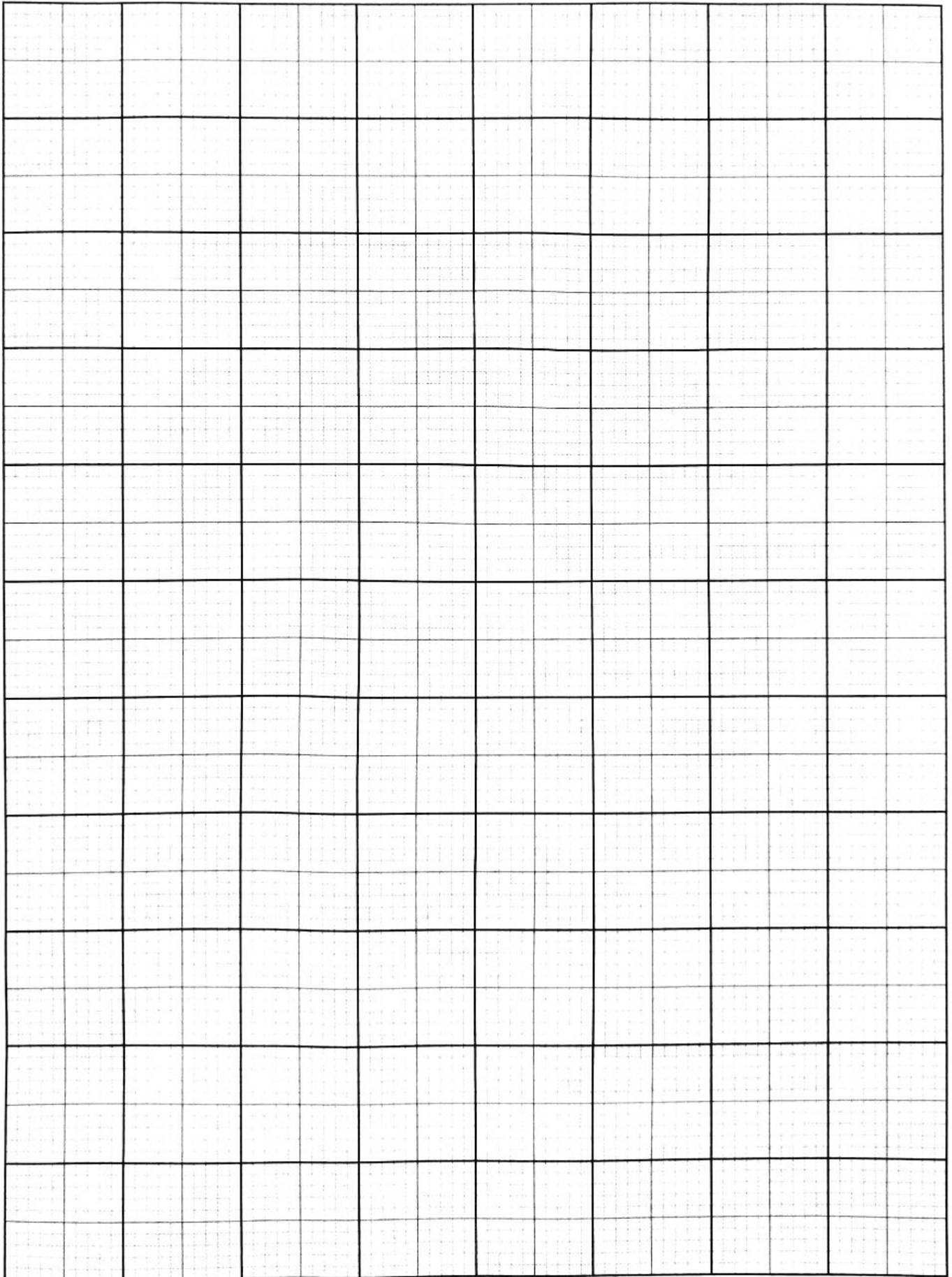
Table 4

- (a) Berdasarkan data di Jadual 4, hitung sisihan piawai. [4 markah]
Based on the data in Table 4, calculate standard deviation. [4 marks]
- (b) Untuk ceraian soalan ini, gunakan kertas graf yang disediakan di halaman 27. Dengan menggunakan skala 2 cm kepada 15 markah pada paksi mengufuk dan 2 cm kepada 5 orang murid pada paksi mencancang, lukis satu ogif bagi data tersebut. [5 markah]
For this part of the question, use the graph paper provided on page 27. By using a scale of 2 cm to 15 marks on the horizontal axis and 2 cm to 5 pupils on the vertical axis, draw an ogive for the data. [5 marks]

Jawapan / Answer :

(a)

Graf untuk soalan 13(b)
Graph for question 13(b)



- 14 (a) Lengkapkan Jadual 5 di ruang jawapan bagi persamaan $y = 3x^2 + \frac{7}{2}x - 3$ dengan menulis nilai-nilai y apabila $x = -1.5$ dan $x = 2$. [2 markah]

Complete Table 5 in the answer space for the equation $y = 3x^2 + \frac{7}{2}x - 3$ by writing the values of y when $x = -1.5$ and $x = 2$. [2 marks]

- (b) Untuk ceraihan soalan ini, gunakan kertas graf yang disediakan di halaman 29. Anda boleh menggunakan pembaris fleksibel. Menggunakan skala 2 cm kepada 1 unit pada paksi- x dan 2 cm kepada 5 unit pada paksi- y , lukis graf bagi $y = 3x^2 + \frac{7}{2}x - 3$ untuk $-4 \leq x \leq 3$. [4 markah]

For this part of the question, use the graph paper provided on page 29. You can use a flexible ruler.

Using a scale of 2 cm to 1 unit on the x -axis and 2 cm to 5 units on the y -axis, draw the graph of $y = 3x^2 + \frac{7}{2}x - 3$ for $-4 \leq x \leq 3$. [4 marks]

- (c) Berdasarkan graf di 14(b), cari
Based on the graph in 14(b), find

(i) nilai-nilai x apabila $y = 24$
the values of x when $y = 24$

(ii) nilai y apabila $x = -0.5$
the value of y when $x = -0.5$

[3 markah]
[3 marks]

Jawapan / Answer :

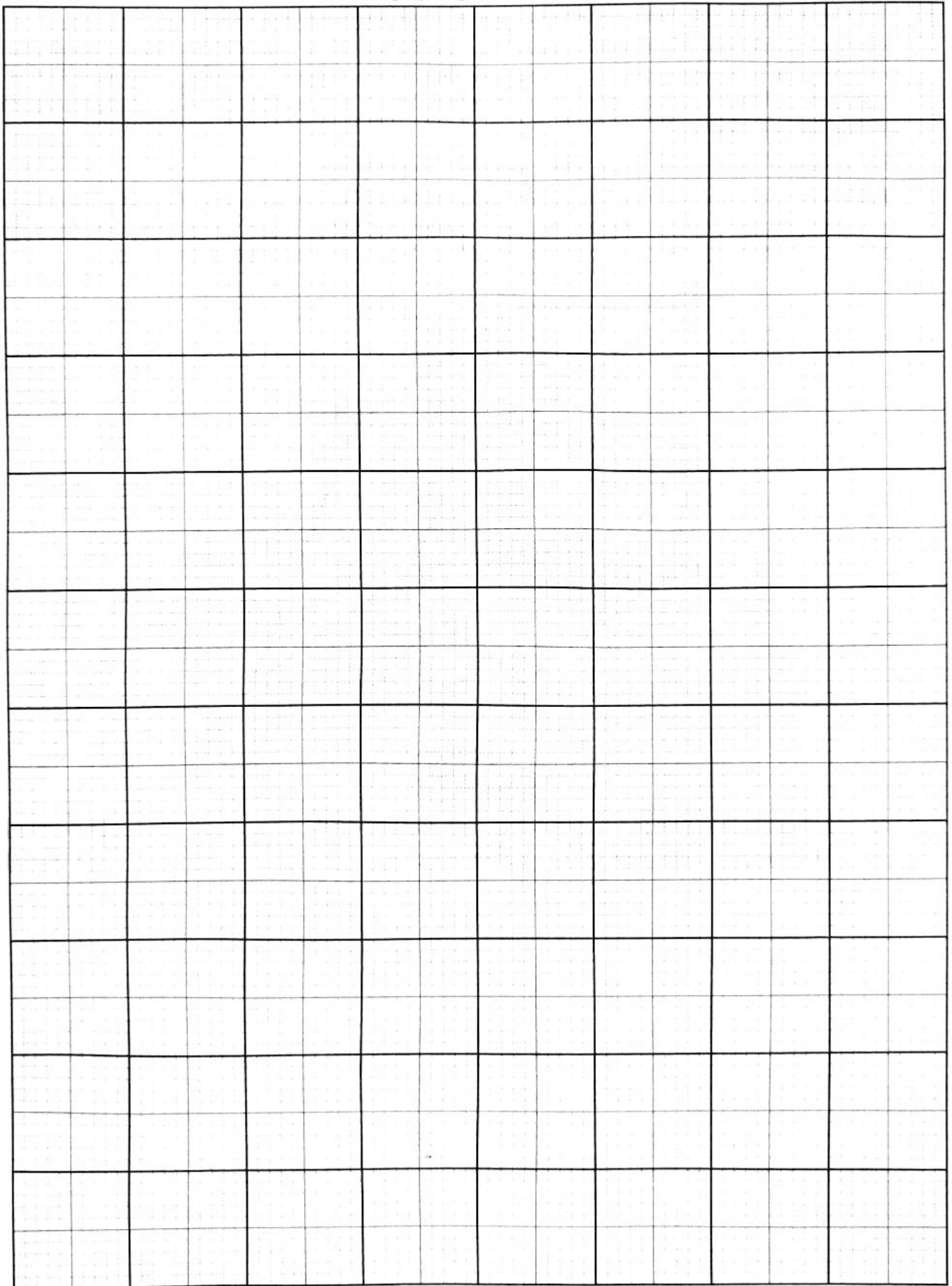
(a)

x	-4	-3	-2	-1.5	0	0.5	1	2	3
y	31	13.5	2		-3	-0.5	3.5		34.5

Jadual 5
Table 5

- (b) Rujuk graf pada halaman 29.
Refer to the graph on page 29.
- (c) (i) $x = \dots\dots\dots$
- (ii) $y = \dots\dots\dots$

Graf untuk soalan 14(b)
Graph for question 14(b)

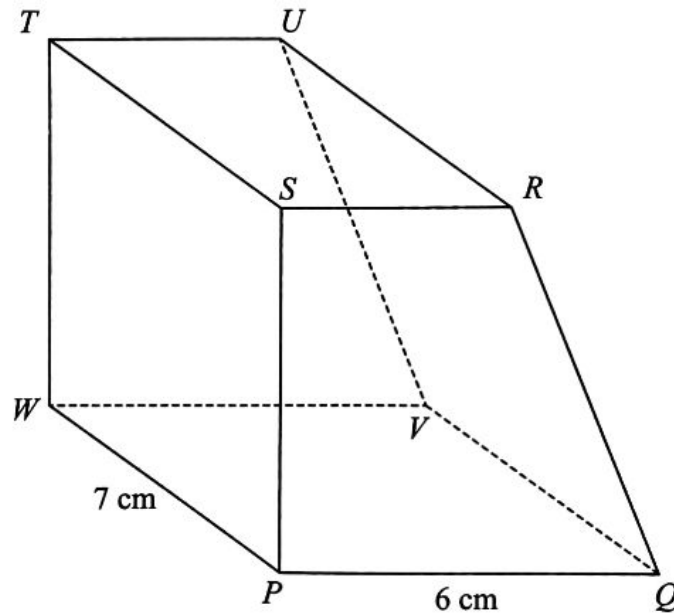


- 15 Anda tidak dibenarkan menggunakan kertas graf untuk menjawab soalan ini.

Adam perlu menyelesaikan satu tugas yang melibatkan blok kayu di sekolahnya. Rajah 9(a) menunjukkan blok kayu berbentuk prisma yang diterimanya dengan tapak segi empat tepat $PQVW$. $PQRS$ adalah keratan rentas kepada prisma tersebut. Diberi bahawa $PQ : SR = 3 : 2$ dan panjang PS adalah dua kali panjang SR .

You are not allowed to use graph paper to answer this question.

Adam needs to complete an assignment involving wooden blocks at his school. Diagram 9(a) shows a wooden block prism he received with a rectangular base $PQVW$. $PQRS$ is the cross section of the prism. Given that $PQ : SR = 3 : 2$ and the length of PS is twice the length of SR .



Rajah 9(a)
Diagram 9(a)

- (a) Lukis dengan skala penuh, pelan bagi blok kayu tersebut.
Draw to full scale, plan of the wooden block.

[3 markah]

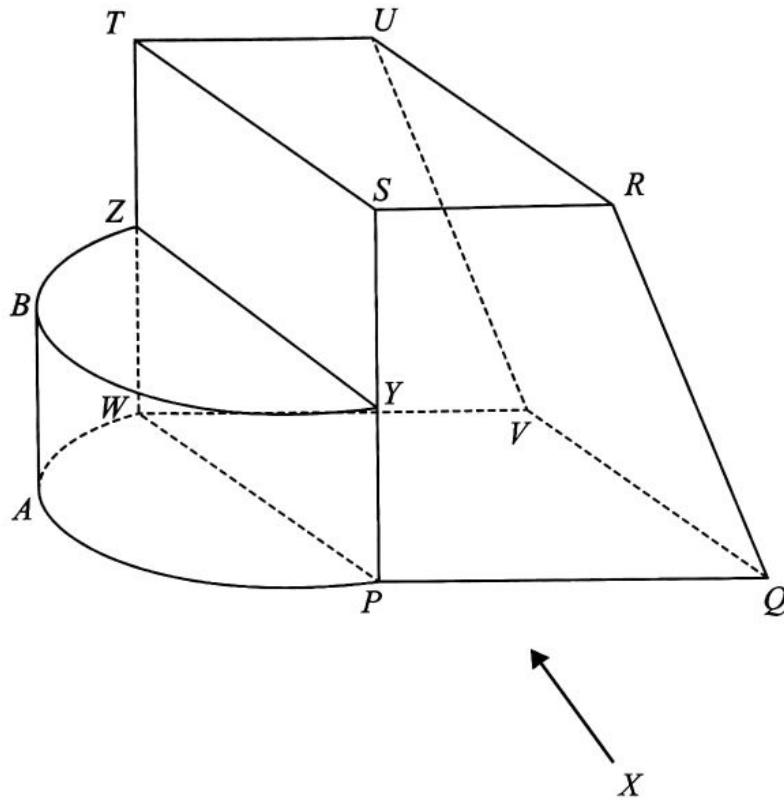
[3 marks]

Jawapan / Answer :

(a)

- (b) Semasa menyiapkan tugas tersebut, Adam telah menerima sebuah lagi blok kayu berbentuk separuh silinder yang perlu dicantumkan seperti ditunjukkan dalam Rajah 9(b). Tinggi blok separuh silinder tersebut adalah sama dengan panjang SR .

While completing the task, Adam received another half cylindrical of wooden block that needed to be joined as shown in Diagram 9(b). The height of the half cylindrical block is equal to the length of SR .



Rajah 9(b)
Diagram 9(b)

- (i) Lukis dengan skala penuh, dongakan gabungan blok kayu yang diterima tersebut pada satah mencancang yang selari dengan PQ sebagaimana dilihat dari X .

[4 markah]

Draw to full scale, the elevation of the composite wooden block received on a vertical plane parallel to PQ as viewed from X .

[4 marks]

- (ii) Bagi mencantikkan gabungan blok tersebut, Adam mengecat separuh silinder dengan warna merah.

Dengan menggunakan $\pi = \frac{22}{7}$, hitung luas, dalam cm^2 , bagi permukaan yang diwarnakan tersebut. [3 markah]

To beautify the composite block, Adam painted the half cylindrical in red colour.

By using $\pi = \frac{22}{7}$, calculate the area, in cm^2 , of the coloured surface. [3 marks]

Jawapan / Answer :

(b) (i)

(ii)

Bahagian C
Section C

[15 markah]

[15 marks]

Bahagian ini mengandungi **dua** soalan. Jawab **satu** soalan.

*This section has **two** questions. Answer **one** question.*

- 16** Encik Emir mempunyai sebuah kedai yang menjual pelbagai jenis Kopi Hipster. Pada suatu hujung minggu tertentu, dia mengambil bahagian dalam suatu Pesta Heboh yang berlangsung selama dua hari. Dia menjual Kopi Hipster dalam dua pakej yang berlainan. Jadual 6 menunjukkan maklumat pakej tersebut.

Encik Emir has a shop selling various types of Hipster Coffee. On a particular weekend, he took part in Pesta Heboh for two days. He sold his Hipster Coffee in two different packages. Table 6 shows information about the packages.

Pakej <i>Package</i>	Jenis Kopi Hipster <i>Type of Hipster Coffee</i>	Harga Per Pakej (RM) <i>Price Per Package (RM)</i>
Ekonomi <i>Economy</i>	2 Latte & 2 Kapucino <i>2 Latte & 2 Cappuccino</i>	<i>K</i>
Premium <i>Premium</i>	2 Butterscotch & 2 Macadamia <i>2 Butterscotch & 2 Macadamia</i>	<i>L</i>

Jadual 6

Table 6

- (a) Pada hari pertama, dia berjaya menjual 35 pakej Ekonomi dan 45 pakej Premium dengan hasil jualan RM890. Pada hari kedua, jualan pakej Ekonomi adalah dua kali jualannya pada hari pertama manakala jualan pakej Premium adalah $\frac{2}{3}$ daripada jualannya pada hari pertama. Jumlah jualannya sepanjang Pesta Heboh itu ialah RM1 950. Dengan menggunakan kaedah matriks, hitung harga pakej, dalam RM, *K* dan *L*.

[5 markah]

On the first day, he sold 35 of Economy's packages and 45 of Premium's packages with a total sale of RM890. On the second day, the number of Economy's packages sold was doubled compared to its sale on the first day and the number of Premium's packages sold were $\frac{2}{3}$ compared to its sale on the first day. His total sales during the Pesta Heboh were RM1 950.

*By using the matrix method, calculate the package price, in RM, *K* and *L*.* [5 marks]

Jawapan / Answer :

(a)

- (b) Encik Emir perlu memilih selebih-lebihnya 20 orang pelanggan setiap hari bagi cabutan bertuah, manakala bilangan pelanggan perempuan perlu sekurang-kurangnya dua kali bilangan pelanggan lelaki.

Encik Emir needs to select at most 20 customers every day for the lucky draw, while the number of female customers must be at least twice the number of male customers.

- (i) Menggunakan x untuk mewakili bilangan pelanggan perempuan dan y untuk mewakili bilangan pelanggan lelaki, tulis dua ketaksamaan linear selain $x \geq 0$ dan $y \geq 0$ yang mewakili syarat pemilihan pemenang cabutan bertuah. [2 markah]

Using x to represent the number of female customers and y to represent the number of male customers, write two linear inequalities other than $x \geq 0$ and $y \geq 0$ that represent the conditions for selecting the winner of the lucky draw. [2 marks]

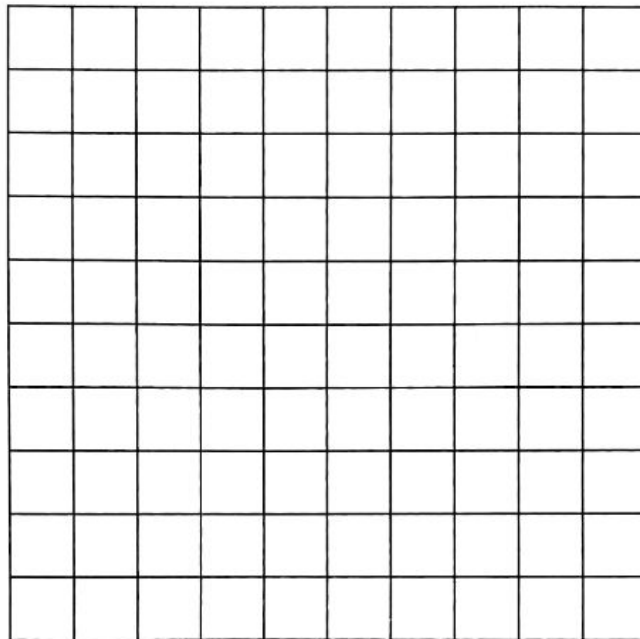
- (ii) Lukis dan lorek rantau yang memuaskan sistem ketaksamaan linear tersebut pada ruang jawapan 16(b)(ii). [4 markah]

Draw and shade the region that satisfies the system of linear inequalities in the answer space in 16(b)(ii). [4 marks]

Jawapan / Answer :

(b) (i)

(ii)



- (c) Pada awal tahun 2019, Encik Emir memperoleh keuntungan daripada perniagaannya. Beliau melabur hasil keuntungannya dalam dua jenis pelaburan, Megah Holding dan Kencana Maju. Beliau menjual kesemua unit saham itu pada awal tahun 2020 dan memperoleh masing-masing RM21 400 dan RM23 200 bagi pelaburan Megah Holding dan pelaburan Kencana Maju. Jadual 7 menunjukkan maklumat bagi kedua-dua pelaburan itu.

At the beginning of year 2019, Encik Emir obtained profit from his business. He invested his profit in two types of investments, Megah Holding and Kencana Maju. He sold all his shares at the beginning of the year 2020 and obtained RM21 400 and RM23 200 for Megah Holding and Kencana Maju investments respectively. Table 7 shows information for both investments.

Pelaburan Investment	Megah Holding	Kencana Maju
Harga belian seunit <i>Buying price per unit</i>	RM2.40	RM2.60
Bilangan unit saham yang dibeli <i>Number of shares purchase</i>	8 000	8 000
Dividen <i>Dividend</i>	RM150 setiap 6 bulan RM150 every 6 months	RM250.00
Bonus <i>Bonus</i>	3.5% setahun 3.5% per annum	3.8% setahun 3.8% per annum

Jadual 7

Table 7

Pelaburan manakah yang memberikan nilai pulangan pelaburan yang lebih menguntungkan? Justifikasikan jawapan anda. [4 markah]

Which investment is more profitable in return of investment? Justify your answer.

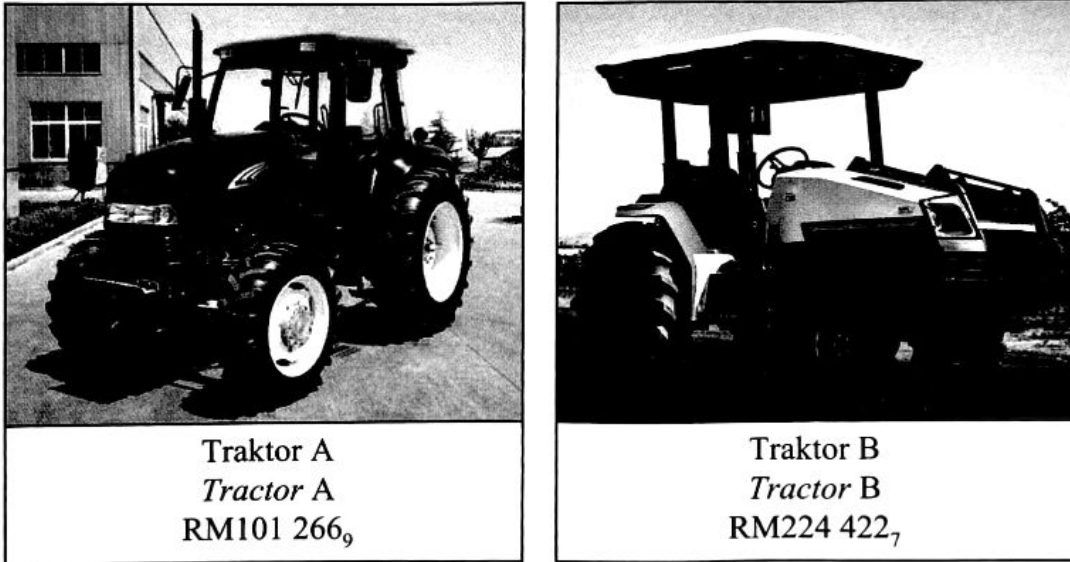
[4 marks]

Jawapan / Answer :

(c)

- 17 Alex Tan, seorang graduan Universiti Putra Malaysia (UPM) menceburi bidang pertanian mengikut jejak langkah ayahnya. Setelah menghadiri Program Agropreneur Muda, Alex Tan ingin mengembangkan potensi kerjayanya dengan bercadang untuk membeli sebuah traktor yang moden dengan harga yang sangat berpatutan. Rajah 10 menunjukkan harga bagi dua buah traktor dalam dua asas nombor yang berbeza.

Alex Tan is a degree holder from Putra University of Malaysia (UPM) has a high interest in agriculture like his father. After attending a Young Agropreneurs Programme, Alex Tan wanted to expand his career by planning to buy a modern tractor with a very reasonable price. Diagram 10 shows the price of two tractors in two different number bases.



Rajah 10
Diagram 10

- (a) (i) Ungkapkan RM101 266₉ kepada nombor dalam asas sepuluh. [1 markah]
Express RM101 266₉ to a number in base ten. [1 mark]
- (ii) Tentukan traktor yang manakah yang lebih murah untuk dibeli oleh Alex Tan. [3 markah]
Determine which tractor is cheaper for Alex Tan to purchase. [3 marks]

Jawapan / Answer :

(a) (i)

(ii)

- (b) Ayah Alex Tan menghadiahkan sebidang tanah pertanian di Selangor kepadanya. Alex Tan juga memiliki sebuah rumah yang berdekatan dengan tanah tersebut. Jadual 8 merupakan keterangan berkaitan tanah dan rumah Alex Tan.

Alex Tan's father presented a piece of agricultural land in Selangor to him. Alex Tan also has a house that is near to his land. Table 8 shows the details of Alex Tan's land and house.

Keluasan tanah <i>Land area</i>	10x m × 6x m
Anggaran sewa tanah <i>Estimated rent for the land</i>	RM1 150 sebulan RM1 150 <i>monthly</i>
Jumlah cukai pintu <i>Property assessment tax</i>	RM759
Kadar cukai tanah <i>Quit rent rate</i>	RM0.05 per meter persegi RM0.05 <i>per square metre</i>
Jumlah cukai tanah <i>Quit rent</i>	RM300

Jadual 8

Table 8

- (i) Hitung nilai x . [2 markah]
Calculate the value of x . [2 marks]
- (ii) Hitung kadar cukai pintu bagi rumah Alex Tan. [3 markah]
Calculate the property assessment tax rate for Alex Tan's house. [3 marks]

Jawapan / Answer :

(b) (i)

(ii)

- (c) Alex Tan telah membeli sebuah kenderaan pacuan empat roda dengan kapasiti enjin 2 494 cc untuk kegunaan mengangkut hasil pertanian. Jadual 9 menunjukkan kadar cukai jalan di Semenanjung Malaysia.

Alex Tan has bought a four wheels drive with an engine capacity of 2 494 cc for him to transport his agriculture yield. Table 9 shows the rate of road tax in Peninsular Malaysia.

Kapasiti enjin <i>Engine capacity</i>	Kadar cukai jalan <i>Road tax rate</i>	
	Kadar asas <i>Base rate</i>	Kadar progresif <i>Progressive rate</i>
1 601 cc – 1 800 cc	RM 200	+ RM0.40 setiap cc melebihi 1 600 cc + RM0.40 <i>each cc exceeding</i> 1 600 cc
1 801 cc – 2 000 cc	RM 280	+ RM0.50 setiap cc melebihi 1 800 cc + RM0.50 <i>each cc exceeding</i> 1 800 cc
2 001 cc – 2 500 cc	RM 440	+ RM0.80 setiap cc melebihi 2 000 cc + RM0.80 <i>each cc exceeding</i> 2 000 cc
2 501 cc – 3 000 cc	RM 840	+ RM1.60 setiap cc melebihi 2 500 cc + RM1.60 <i>each cc exceeding</i> 2 500 cc

Jadual 9

Table 9

Hitung cukai jalan bagi pacuan empat roda tersebut.

[3 markah]

Calculate the road tax for the four wheels drive.

[3 marks]

Jawapan / Answer :

(c)

[Lihat halaman sebelah

- (d) Alex Tan bercadang untuk mengadakan kolam tadahan air berbentuk heksagon sekata dengan sisinya 12 m.
Hitung luas, dalam m^2 , kolam tadahan air itu. Berikan jawapan anda dalam tiga angka bererti. [3 markah]

Alex Tan plans to have water catchment pond in the shape of regular hexagon with the side of 12 m.

Calculate the area, in m^2 , of the water catchment pond. Give your answer in three significant figures. [3 marks]

Jawapan / Answer :

(d)

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER