

**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  $= \pi r^2$   
*Area of circle*  $= \pi r^2$
- 5 
$$\frac{\text{Panjang lengkok}}{2\pi r} = \frac{\theta}{360^\circ}$$

$$\frac{\text{Arc length}}{2\pi r} = \frac{\theta}{360^\circ}$$
- 6 
$$\frac{\text{Luas sektor}}{\pi r^2} = \frac{\theta}{360^\circ}$$

$$\frac{\text{Area of sector}}{\pi r^2} = \frac{\theta}{360^\circ}$$
- 7 Luas layang-layang  $= \frac{1}{2} \times$  hasil darab panjang dua pepenjuru  
*Area of kite*  $= \frac{1}{2} \times \text{product of two diagonals}$
- 8 Luas trapezium  $= \frac{1}{2} \times$  hasil tambah dua sisi selari  $\times$  tinggi  
*Area of trapezium*  $= \frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
- 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 Isipadu prisma tegak  $=$  luas keratan rentas  $\times$  tinggi  
*Volume of right prism*  $= \text{cross sectional area} \times \text{height}$
- 13 Isipadu silinder  $= \pi r^2 h$   
*Volume of cylinder*  $= \pi r^2 h$   
 Isipadu kon  $= \frac{1}{3} \pi r^2 h$
- 14 
$$\text{Volume of cone} = \frac{1}{3} \pi r^2 h$$

- 15 Isipadu sfera =  $\frac{4}{3}\pi r^3$   
*Volume of sphere* =  $\frac{4}{3}\pi r^3$
- 16 Isipadu piramid tegak =  $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$   
*Volume of right pyramid* =  $\frac{1}{3} \times \text{base area} \times \text{height}$
- 17 Faktor skala,  $k = \frac{PA'}{PA}$   
*Scale factor, k* =  $\frac{PA'}{PA}$
- 18 Luas imej =  $k^2 \times \text{luas objek}$   
*Area of image* =  $k^2 \times \text{area of object}$

### STATISTIK DAN KEBARANGKALIAN STATISTICS AND PROBABILITY

- 1 Min / Mean,  $\bar{x} = \frac{\sum x}{N}$
- 2 Min / Mean,  $\bar{x} = \frac{\sum fx}{\sum f}$
- 3 Varians / Variance,  $\sigma^2 = \frac{\sum (x - \bar{x})^2}{N} = \frac{\sum x^2}{N} - \bar{x}^2$
- 4 Varians / Variance,  $\sigma^2 = \frac{\sum f(x - \bar{x})^2}{\sum f} = \frac{\sum fx^2}{\sum f} - \bar{x}^2$
- 5 Sisihan piawai / Standard deviation,  $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$
- 6 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  $P(A) = \frac{n(A)}{n(S)}$
- 8  $P(A') = 1 - P(A)$

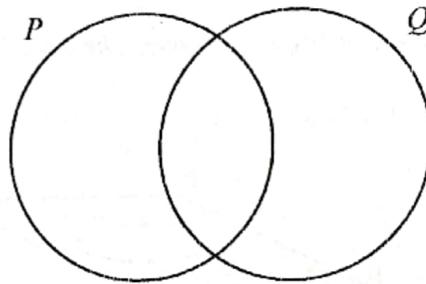
**Bahagian A / Section A**  
**[ 40 markah / marks ]**

Jawab semua soalan dalam bahagian ini.  
*Answer all questions in this section.*

1. (a) Diberi bahawa set  $P = \{ \text{lima gandaan empat yang pertama} \}$  dan set  $Q = \{ 4, 9, 16 \}$ .  
 Lengkapkan gambar rajah Venn di ruang jawapan untuk menunjukkan hubungan antara set  $P$  dan set  $Q$ .

*It is given that set  $P = \{ \text{first five multiples of four} \}$ , and set  $Q = \{ 4, 9, 16 \}$ . Complete the Venn diagram in the answer space to show the relationship between set  $P$  and set  $Q$ .*

Jawapan / Answer :



[1 markah / mark]

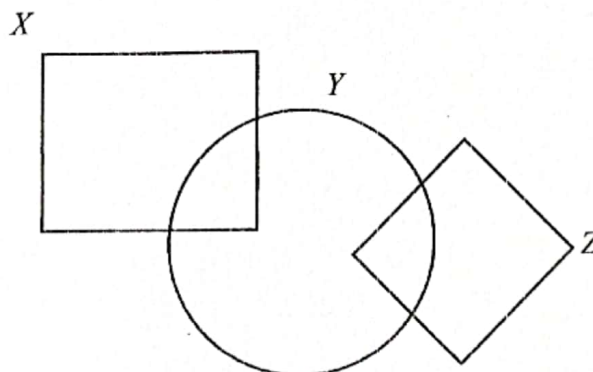
- (b) Gambar rajah Venn di ruang jawapan menunjukkan set  $X$ , set  $Y$  dan set  $Z$  dengan keadaan set semesta,  $\xi = X \cup Y \cup Z$ .

Pada rajah di ruang jawapan, lorek set  $X \cup Y \cap Z'$

*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  $X \cup Y \cap Z'$*

Jawapan / Answer :



[2 markah / marks]

2. Rajah 2 menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segi empat tepat  $ABCD$  di atas meja mengufuk. Trapezium  $ABGF$  ialah keratan rentas seragam prisma itu. Sebuah kon dikeluarkan daripada prisma itu.

*Diagram 2 shows a solid right prism with a rectangular base  $ABCD$  on a horizontal table. The trapezium  $ABGF$  is the uniform cross-section of the prism.*

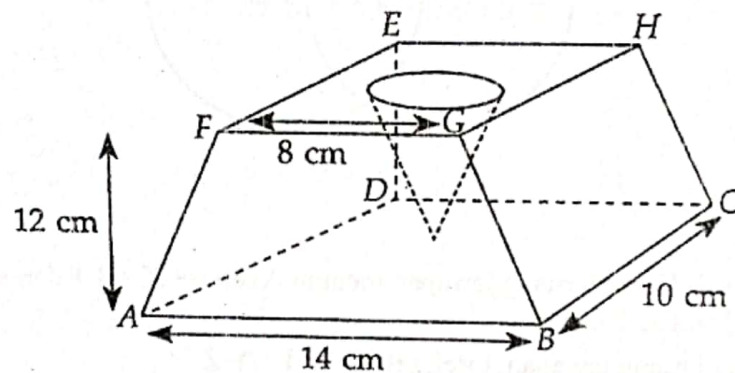
*A cone is removed from the prism.*

Diberi bahawa isipadu pepejal yang tinggal ialah  $1230\frac{1}{6}\text{ cm}^3$ .

Menggunakan  $\pi = \frac{22}{7}$ , hitung jejari dalam cm, kon itu. Kon itu mempunyai diameter dan tinggi yang sama.

*It is given that the volume of the remaining solid is  $1230\frac{1}{6}\text{ cm}^3$ .*

*Using  $\pi = \frac{22}{7}$ , calculate the radius, in cm, of the cone. The cone has the same diameter and height.*



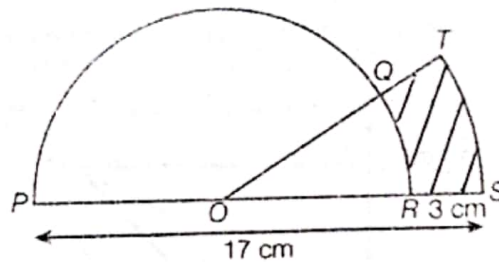
Rajah 2 / Diagram 2

[4 markah / marks]

Jawapan / Answer :

3. Rajah 3 menunjukkan semi bulatan,  $PQR$  dan sektor  $SOT$ , dengan pusat sepunya  $O$ . Diberi bahawa  $\angle POQ : \angle SOT = 4 : 1$ .

Diagram 3 shows a semicircle,  $PQR$  and sector  $SOT$  with a common centre  $O$ . It is given that  $\angle POQ : \angle SOT = 4 : 1$ .



Rajah 3 / Diagram 3

Menggunakan  $\pi = \frac{22}{7}$ , hitung luas, dalam  $\text{cm}^2$ , kawasan berlorek.

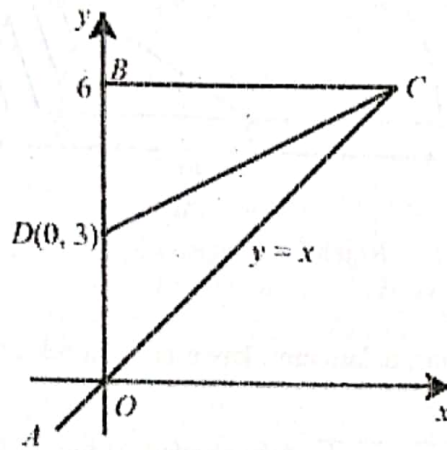
Using  $\pi = \frac{22}{7}$ , calculate the area, in  $\text{cm}^2$ , of the shaded region.

[3 markah / marks]

Jawapan / Answer :

4. Rajah 4 menunjukkan garis lurus  $AC$ , garis lurus  $DC$  dan garis lurus  $BC$  yang dilukis pada suatu satah Cartesan dan  $O$  ialah asalan. Persamaan garis lurus  $AC$  ialah  $y = x$ . Garis lurus  $BC$  selari dengan paksi- $x$ .

Diagram 4 shows straight line  $AC$ , straight line  $DC$  and straight line  $BC$  drawn on a Cartesian plane and  $O$  is the origin. The equation of the straight line  $AC$  is  $y = x$ . Straight line  $BC$  is parallel to  $x$ -axis.



Rajah 4 / Diagram 4

Cari

Find

- (a) persamaan bagi garis lurus  $BC$ .  
equation of the straight line  $BC$ .
- (b) persamaan bagi garis lurus  $DC$ .  
equation of the straight line  $DC$ .

[4 markah / marks]

Jawapan / Answer :

(a)

(b)

5. Pada bulan Februari, Wong telah membelanjakan sebanyak RM400 untuk minyak kereta. Pada bulan Mac, harga minyak telah meningkat sebanyak RM0.10 per liter dan dia telah membelanjakan RM230 lebih daripada bulan Februari kerana keretanya menggunakan 100 liter minyak lebih daripada bulan Februari. Cari harga bagi 1 liter minyak pada bulan Mac.

**[Diberi bahawa harga minyak adalah melebihi RM1 per liter]**

*In February, Wong spent RM400 on car's petrol. In March, the price of petrol has increased by RM0.10 per litre and he spent RM230 more than February because his car used 100 litres of petrol more than February. Find the price of 1 litre of petrol in March.*

**[It is given that the price of petrol is more than RM1 per litre].**

**[4 markah / marks]**

**Jawapan / Answer :**

|                               |  |
|-------------------------------|--|
| $400 = (x - 0.10) \times 100$ |  |
| $400 = (x - 0.10) \times 100$ |  |
| $400 = (x - 0.10) \times 100$ |  |

6. (a) Nyatakan sama ada pernyataan berikut adalah benar atau palsu.

*State whether the following statement is true or false.*

$$-6 > 2 \text{ dan } (-3)^3 = -27$$

$$-6 > 2 \text{ and } (-3)^3 = -27$$

- (b) Tulis **dua** implikasi berdasarkan pernyataan berikut :

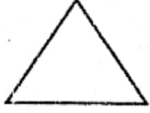
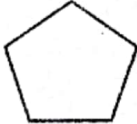
*Write down two implications based on the following statements :*

$$m + 4 = 11 \text{ jika dan hanya jika } m = 7$$

$$m + 4 = 11 \text{ if and only if } m = 7$$

- (c) Jadual 6 menunjukkan bilangan sisi dan sudut pedalaman bagi beberapa poligon sekata.

*Table 6 shows the number of sides and the interior angles of some regular polygons.*

| Poligon sekata<br><i>Regular polygon</i>                                            | Bilangan sisi<br><i>Number of sides</i> | Sudut pedalaman<br><i>Interior angle</i> |
|-------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------|
|    | 3                                       | $\frac{(3 - 2) \times 180^\circ}{3}$     |
|  | 4                                       | $\frac{(4 - 2) \times 180^\circ}{4}$     |
|  | 5                                       | $\frac{(5 - 2) \times 180^\circ}{5}$     |

Jadual 6 / Table 6

Buat satu kesimpulan umum secara induktif untuk sudut pedalaman poligon sekata dengan  $n$  sisi.

*Make a general conclusion by induction for the interior angle of a regular polygon with  $n$  sides.*

[5 markah / marks]

Jawapan / Answer :

(a)

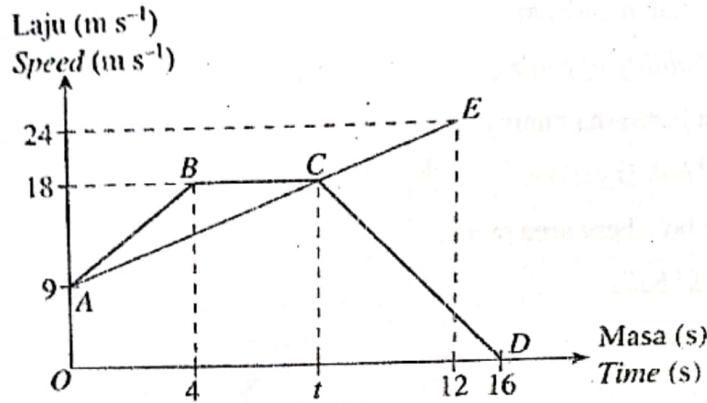
(b) Implikasi / *Implication* 1 : .....

Implikasi / *Implication* 2 : .....

(c)

7. Rajah 7 menunjukkan graf laju-masa bagi pergerakan dua zarah,  $P$  dan  $Q$ , masing-masing dalam tempoh 12 saat dan 16 saat. Graf  $ACE$  mewakili pergerakan  $P$  dan graf  $ABCD$  mewakili pergerakan  $Q$ . Kedua-dua zarah itu bermula pada titik yang sama dan melalui laluan yang sama.

*Diagram 7 shows the speed-time graph for the movement of two particles,  $P$  and  $Q$ , for a period of 12 seconds and 16 seconds respectively. The graph  $ACE$  represents the movement of  $P$  and the graph  $ABCD$  represents the movement of  $Q$ . Both particles start at the same point and move along the same route.*



Rajah 7 / Diagram 7

Diberi bahawa jarak yang dilalui oleh zarah  $Q$  adalah 27 meter lebih daripada jarak yang dilalui oleh zarah  $P$  apabila kedua-dua zarah itu mencapai laju yang sama pada  $t$  saat. Hitung nilai  $t$ .

*It is given that the distance travelled by particle  $Q$  is 27 metre more than the distance travelled by particle  $P$  when both particles reached the same speed at  $t$  seconds. Calculate the value of  $t$ .*

[3 markah / marks]

Jawapan / Answer :

8. Sebuah kotak mengandungi 6 biji bola merah dan sebiji bola kuning. Dua biji bola dipilih secara rawak dari kotak itu satu demi satu tanpa pemulangan. Warna bola itu dicatatkan.

*A box contains 6 red balls and a yellow ball. Two balls are chosen at random one by one from the box without replacement. The colours of the balls are recorded.*

- (a) Wakilkan situasi di atas dengan menggunakan gambar rajah pokok.

*Represent the above situation by using a tree diagram.*

- (b) Hitung kebarangkalian mendapat

*Calculate the probability of getting*

- (i) bola kedua berwarna kuning.

*the second ball is yellow.*

- (ii) kedua-dua bola berwarna merah.

*both are red balls.*

[5 markah / marks]

Jawapan / Answer :

- (a)

- (b) (i)

- (ii)

9. Airil membeli 4 tiket wayang dewasa dan 2 tiket wayang kanak-kanak dengan harga RM68. Harga tiket dewasa adalah RM 5 lebih mahal berbanding tiket kanak-kanak.

*Airil bought 4 movie tickets for adults and 2 movie tickets for children with the price of RM68. The price of ticket for adult is RM 5 more expensive than ticket for children.*

Menggunakan kaedah matriks, hitung harga, dalam RM, bagi sekeping tiket wayang dewasa dan sekeping tiket wayang kanak-kanak.

*Using the matrix method, calculate the price, in RM, of a movie ticket for adult and a movie ticket for children.*

[5 markah / marks]

Jawapan / Answer :

10. Encik Husnin ingin membeli insurans kebakaran rumahnya. Nilai boleh insurans rumahnya itu ialah RM300 000. Jadual 10 menunjukkan polisi insurans yang disediakan oleh SP Insurance Sdn. Bhd.
- Encik Husnin wants to buy fire insurance for his house. The insurable value of his house is RM300 000. Table 10 shows the insurance policy provided by SP Insurance Sdn. Bhd.*

| <b>Polisi insurans kebakaran oleh SP Insurance Sdn. Bhd.</b><br><b><i>Fire insurance policy by SP Insurance Sdn. Bhd.</i></b> |         |
|-------------------------------------------------------------------------------------------------------------------------------|---------|
| Ko-insurans<br><i>Co-insurance</i>                                                                                            | 80%     |
| Deduktibel<br><i>Deductible</i>                                                                                               | RM4 000 |

Jadual 10 / Table 10

- (i) Hitung jumlah insurans yang perlu dibeli oleh Encik Husnin bagi rumahnya itu.  
*Calculate the amount of insurance need to buy Encik Husnin for his house.*
- (ii) Hitung bayaran pampasan yang diterima oleh Encik Husnin jika dia telah menginsuranskan rumahnya dengan jumlah RM180 000 dan rumahnya telah terbakar dengan jumlah kerugian sebanyak RM70 000.  
*Calculate the amount of compensation that Encik Husnin will receive if he insured his house at a sum of RM180 000 and his house caught on fire with the amount of loss is RM70 000*

[4 markah / marks]

Jawapan / Answer :

(i)

(ii)

**Bahagian B / Section B**  
[ 45 markah / marks ]

Jawab semua soalan dalam bahagian ini.  
*Answer all questions in this section.*

11. (a) Lengkapkan Jadual 11 di ruang jawapan bagi persamaan  $y = x^3 - 2x - 12$  dengan menulis nilai-nilai  $y$  apabila  $x = -2$ ,  $x = 1$  dan  $x = 3$ .  
*Complete Table 11 in the answer space for the equation  $y = x^3 - 2x - 12$  by writing down the values of  $y$  when  $x = -2$ ,  $x = 1$  and  $x = 3$ .* [3 markah / marks]
- (b) Untuk ceraihan soalan ini, gunakan kertas yang disediakan. Anda boleh menggunakan pembaris fleksibel.  
Dengan menggunakan skala 2 cm kepada 1 unit pada paksi  $x$  dan 2 cm kepada 10 unit pada paksi  $y$ , Lukis graf  $y = x^3 - 2x - 12$  untuk  $-3 \leq x \leq 4$ .  
*For this part of the question, use the graph paper provided. You may use a flexible curve ruler. Using a scale of 2 cm to 1 unit on the  $x$ -axis and 2 cm to 10 units on the  $y$ -axis, draw the graph of  $y = x^3 - 2x - 12$  for  $-3 \leq x \leq 4$ .* [4 markah / marks]
- (c) Daripada graph di 11(b), cari  
*From the graph in 11(b), find*
- (i) nilai  $y$  apabila  $x = -2.2$   
*the value of  $y$  when  $x = -2.2$*
- (ii) nilai  $x$  apabila  $y = 4$   
*the value of  $x$  when  $y = 4$*  [2 markah / marks]

Jawapan / Answer :

(a)  $y = x^3 - 2x - 12$

|     |     |    |     |     |   |    |   |       |    |
|-----|-----|----|-----|-----|---|----|---|-------|----|
| $x$ | -3  | -2 | -1  | 0   | 1 | 2  | 3 | 3.5   | 4  |
| $y$ | -33 |    | -11 | -12 |   | -8 |   | 23.88 | 44 |

Jadual 11 / Table 11

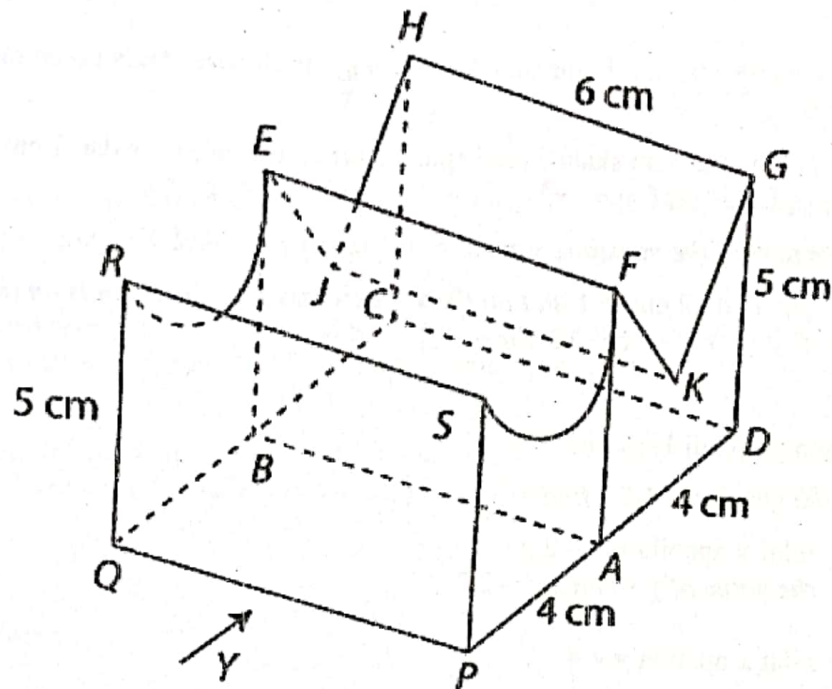
- (b) Rujuk graph.  
*Refer to the graph.*
- (c) (i)  $y = \dots\dots\dots$
- (ii)  $x = \dots\dots\dots$

12. Anda tidak dibenarkan menggunakan kertas graf untuk menjawab soalan ini.

*You are not allowed to use a graph paper to answer this questions.*

Rajah 12 menunjukkan gabungan dua prisma yang bercantum pada satah  $ABEF$ . Permukaan  $APSF$  ialah keratan rentas seragam prisma itu dan  $SREF$  ialah separuh silinder. Segi empat tepat  $PQRS$  ialah satah mencancang. Tapak  $PQBCDA$  adalah pada satah mengufuk. Tinggi tegak  $K$  dari tapak ialah 2 cm.

*Diagram 12 shows a combination of two prisms joining to the plane  $ABEF$ . The surface of the  $APSF$  is the cross-section of the prism and the  $SREF$  is a half cylinder. The rectangle  $PQRS$  is the vertical plane. The base  $PQBCDA$  is on the horizontal plane. The vertical height of  $K$  from base is 2 cm.*



Rajah 12 / Diagram 12

Lukis dengan skala penuh

*Draw to full scale*

- (a) Pelan pepejal itu.

*The plan of the solid.*

[4 markah / marks]

- (b) Lukiskan gabungan pepejal itu pada satah mencancang yang selari dengan  $PQ$  sebagaimana dilihat dari  $Y$ .

*The elevation of the combined solid on a vertical plane parallel to  $PQ$  as viewed from  $Y$ .*

[5 markah / marks]

Jawapan / Answer :

(a)

(b)

13. Jadual 13 menunjukkan anggaran perbelanjaan bulanan bagi Singam.

*Table 13 shows the estimated monthly expenses of Singam.*

| <b>Perbelanjaan<br/>Expenses</b>                                      | <b>RM</b> |
|-----------------------------------------------------------------------|-----------|
| Ansuran pinjaman perumahan / <i>Housing loan instalment</i>           | 1 200     |
| Ansuran pinjaman kereta / <i>Car loan instalment</i>                  | 700       |
| Insurans / <i>Insurance</i>                                           | 350       |
| Barang-barang runcit + Bil utility / <i>Groceries + Utility bills</i> | 400       |
| Petrol / <i>Petrol</i>                                                | 300       |
| Pemberian kepada ibu bapa / <i>Allowance for parents</i>              | 500       |
| Anak-anak / <i>Children</i>                                           | 250       |
| Makanan / <i>Food</i>                                                 | 1 450     |

Jadual 13 / Table 13

Berikut menunjukkan dua matlamat kewangan yang ditetapkan oleh Singam.

*The following shows two financial goals set by Singam.*

**Jangka pendek / Short term**

Membeli sebuah motosikal baharu dengan harga RM5 000 untuk anaknya dalam enam bulan.

*To buy a new motorcycle priced at RM5 000 for his son in six months.*

**Jangka panjang / Long term**

Membeli seunit kondominium baharu dengan harga RM550 000 dalam lima tahun. Wang pendahuluan ialah 10% daripada harga kondominium itu.

*To buy a new condominium priced at RM550 000 in five years. The down payment is 10% of the price of the condominium.*

Gaji bersih bulanan Singam ialah RM7 560. Dia ingin menyimpan 15% daripada gajinya untuk dana kecemasan.

*Singam's monthly net salary is RM7 560. He plans to save 15% of his salary for emergency fund.*

- (a) Hitung simpanan bulanan Singam untuk dana kecemasan.

*Calculate Singam's monthly savings for emergency fund.*

[1 markah / mark]

- (b) Lengkapkan pelan kewangan bulanan bagi Singam.

*Complete the monthly financial plan for Singam.*

[5 markah / marks]

- (c) Berdasarkan pelan kewangan bulanan di (b), bolehkah Singam mencapai kedua-dua matlamat kewangannya? Jelaskan jawapan anda.

*Based on the monthly financial plan in (b), will Singam be able to achieve his two financial goals? Explain your answer.*

[3 markah / marks]

Jawapan / Answer :

(a)

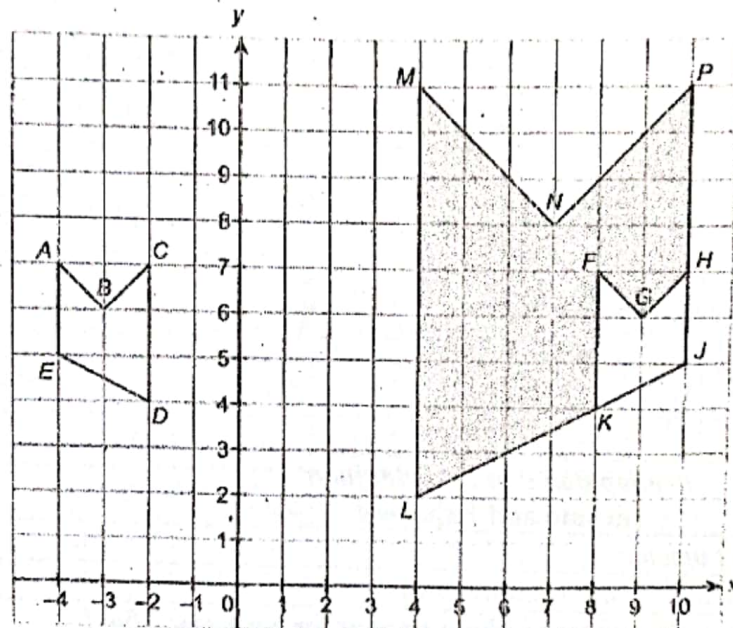
(b)

| <b>Pendapatan dan Perbelanjaan</b><br><b>Income and Expenses</b>                        | <b>RM</b> |  |
|-----------------------------------------------------------------------------------------|-----------|--|
| Pendapatan bersih / <i>Net income</i>                                                   | 7 560     |  |
| Jumlah pendapatan bulanan / <i>Total monthly income</i>                                 | 7 560     |  |
| Tolak simpanan bagi dana kecemasan / <i>Minus savings for emergency fund</i>            |           |  |
| Baki pendapatan / <i>Income balance</i>                                                 |           |  |
| <b>Tolak perbelanjaan tetap bulanan / <i>Minus monthly fixed expenses</i></b>           |           |  |
|                                                                                         |           |  |
|                                                                                         |           |  |
|                                                                                         |           |  |
| Jumlah perbelanjaan tetap bulanan / <i>Total monthly fixed expenses</i>                 |           |  |
| <b>Tolak perbelanjaan tidak tetap bulanan / <i>Minus monthly variables expenses</i></b> |           |  |
| Barang-barang runcit + Bil utiliti / <i>Groceries + Utility bills</i>                   | 400       |  |
|                                                                                         |           |  |
|                                                                                         |           |  |
|                                                                                         |           |  |
| Jumlah perbelanjaan tidak tetap bulanan / <i>Total monthly variable expenses</i>        |           |  |
| Pendapatan lebihan / <i>Surplus of income</i>                                           |           |  |

(c)

14. Rajah 14 menunjukkan tiga buah pentagon,  $ABCDE$ ,  $FGHJK$  dan  $JLMNP$  yang dilukis di atas suatu satah Cartes.

Diagram 14 shows three pentagons,  $ABCDE$ ,  $FGHJK$  and  $JLMNP$  drawn on a Cartesian plane.



Rajah 14 / Diagram 14

- (a) Pentagon  $JLMNP$  ialah imej bagi pentagon  $ABCDE$  di bawah gabungan transformasi **RS**. Huraikan selengkapnya, transformasi

*Pentagon  $JLMNP$  is the image of the pentagon  $ABCDE$  under the combined transformation **RS**. Describe in full, the transformation*

(i) **S**

(ii) **R**

[5 markah / marks]

- (b) Diberi bahawa pentagon  $ABCDE$  mewakili suatu kawasan yang mempunyai luas  $40 \text{ m}^2$ . Hitung luas, dalam  $\text{m}^2$ , yang diwakili oleh kawasan berlorek.

*It is given that pentagon  $ABCDE$  represents a region of area  $40 \text{ m}^2$ . Calculate the area, in  $\text{m}^2$ , represented by the shaded region.*

[3 markah / marks]

Jawapan / Answer :

(a) (i) **S** : .....

**R** : .....

(ii)

15. Jadual 15 (i) menunjukkan taburan kekerapan jisim, dalam kg, bagi 100 orang murid di sebuah sekolah.

*Table 15 (i) shows the frequency distributions of mass, in kg, of 100 students in a school.*

| Jisim (kg) / Mass (kg) | Kekerapan / Frequency |
|------------------------|-----------------------|
| 40 – 49                | 8                     |
| 50 – 59                | 15                    |
| 60 – 69                | 30                    |
| 70 – 79                | 27                    |
| 80 – 89                | 14                    |
| 90 – 99                | 6                     |

Jadual 15 (i) / Table 15 (i)

- (a) Berdasarkan Jadual 15 (i), lengkapkan Jadual 15 (ii) di ruang jawapan.

*Based on Table 15 (i), complete Table 15 (ii) in the answer space.*

[2 markah / marks]

- (b) Untuk ceraihan soalan ini anda dibenarkan menggunakan pembaris fleksibel.

*For this part of the question, you may use a flexible curve ruler.*

Dengan menggunakan skala 2 cm kepada 10 kg pada paksi mengufuk dan 2 cm kepada 10 orang murid pada paksi mencancang, Lukis satu ogif bagi data itu.

*By using a scale of 2 cm to 10 kg on the horizontal axis and 2 cm to 10 students on the vertical axis, draw an ogive for the data.*

[4 markah / marks]

- (c) Hitung sisihan piawai bagi jisim murid-murid tersebut.

*Calculate the standard deviation of the student's mass.*

[4 markah / mass]

Jawapan / Answer :

(a)

| Jisim (kg)<br><i>Mass (kg)</i> | Kekerapan<br><i>Frequency</i> | Titik tengah<br><i>Midpoint</i> | Sempadan atas<br><i>Upper boundary</i> | Kekerapan longgokan<br><i>Cumulative frequency</i> |
|--------------------------------|-------------------------------|---------------------------------|----------------------------------------|----------------------------------------------------|
| 30 – 39                        | 0                             | 34.5                            | 39.5                                   | 0                                                  |
| 40 – 49                        | 8                             | 44.5                            |                                        |                                                    |
| 50 – 59                        | 15                            | 54.5                            |                                        |                                                    |
| 60 – 69                        | 30                            | 64.5                            |                                        |                                                    |
| 70 – 79                        | 27                            | 74.5                            |                                        |                                                    |
| 80 – 89                        | 14                            | 84.5                            |                                        |                                                    |
| 90 – 99                        | 6                             | 94.5                            |                                        |                                                    |

Jadual 15 (ii) / Table 15 (ii)

(b) Rujuk graf.

*Refer to the graph.*

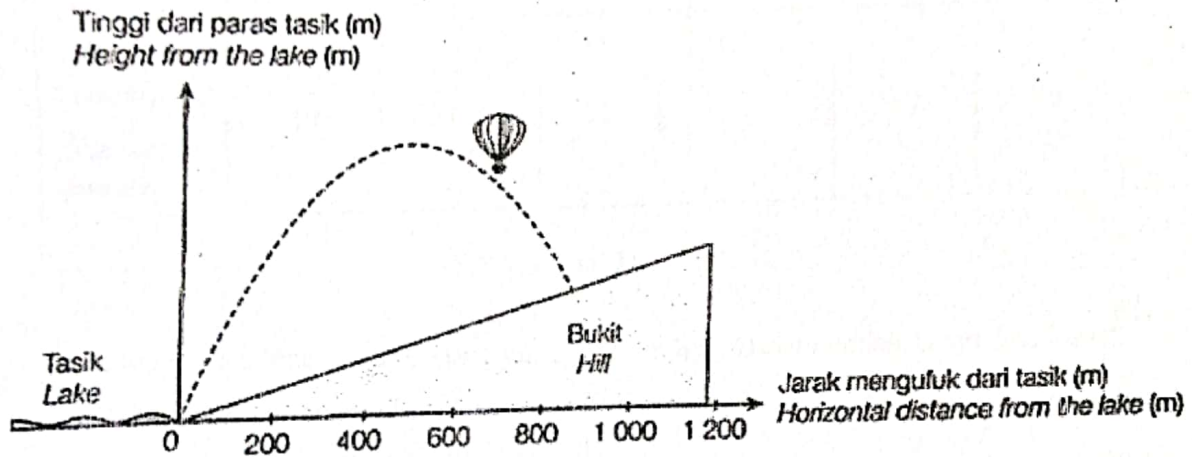
(c)

**Bahagian C / Section C**  
**[ 15 markah / marks ]**

Jawab satu soalan dalam bahagian ini.  
 Answer one question in this section.

16. Sebuah belon udara panas berlepas dari kaki sebuah bukit yang berdekatan dengan sebuah tasik seperti yang ditunjukkan dalam Rajah 16.

*A hot air balloon takes off from the foot of a hill near a lake as shown in Diagram 16.*



Rajah 16 / Diagram 16

Laluan penerbangan belon udara panas itu diwakili oleh fungsi,  $f(x) = -\frac{3}{12500}x^2 + \frac{6}{25}x$ .

Tinggi bukit itu berubah secara langsung dengan jarak mengufuk dari tasik itu pada kadar pertambahan 3 m jarak mencancang bagi setiap 100 m jarak mengufuk.

*The path of the hot air balloon follow is represented by the function,  $f(x) = -\frac{3}{12500}x^2 + \frac{6}{25}x$ .*

*The height of the hill varies directly as the horizontal distance from the lake at an increasing rate of 3 m vertical distance for each 100 m horizontal distance.*

- (a) (i) Berapakah tinggi maksimum yang boleh dicapai belon udara panas itu dari paras air tasik itu ?

*What is the maximum height that can be achieved by the hot air balloon above the lake level ?*

- (ii) Nyatakan fungsi  $b(x)$  bagi tinggi bukit itu.

*State the function  $b(x)$  for the height of the hill.*

- (iii) Di manakah kedudukan belon udara panas itu apabila mendarat ?

*What is the position of the hot air balloon when landing ?*

[8 markah / marks]

Jawapan / Answer :

(a) (i)

(ii)

(iii)

- (b) Jadual 16 menunjukkan bilangan penumpang yang menaiki belon udara bagi bulan Januari hingga bulan Julai

*Table 16 shows the number of passengers who take the hot air balloon from the month January to July.*

| <b>Bulan</b><br><i>Month</i>                             | Januari<br><i>January</i> | Februari<br><i>February</i> | Mac<br><i>March</i> | April<br><i>April</i> | Mei<br><i>May</i> | Jun<br><i>June</i> | Julai<br><i>July</i> |
|----------------------------------------------------------|---------------------------|-----------------------------|---------------------|-----------------------|-------------------|--------------------|----------------------|
| <b>Bilangan Penumpang</b><br><i>Number of passengers</i> | 19                        | 18                          | 15                  | 14                    | 17                | 16                 | 13                   |

Jadual 16 / Table 16

- (i) Hitung min bilangan penumpang yang menaiki belon udara panas dalam satu bulan.  
*Calculate the mean number of passengers who take the hot air balloon in a month.*
- (ii) Hitung varians bagi bilangan penumpang dalam satu bulan dari bulan Januari hingga bulan Julai.  
*Calculate the variance for the number of passengers in a month from the month of January to the month of July.*
- (iii) Jika bilangan penumpang adalah dua kali ganda bagi setiap bulan dari bulan Januari hingga bulan Julai, hitung sisihan piawai baharu.  
*If the number of passengers is twice the original number for each month from the month of January to July, calculate the new standard deviation.*

[7 markah / marks]

Jawapan / Answer :

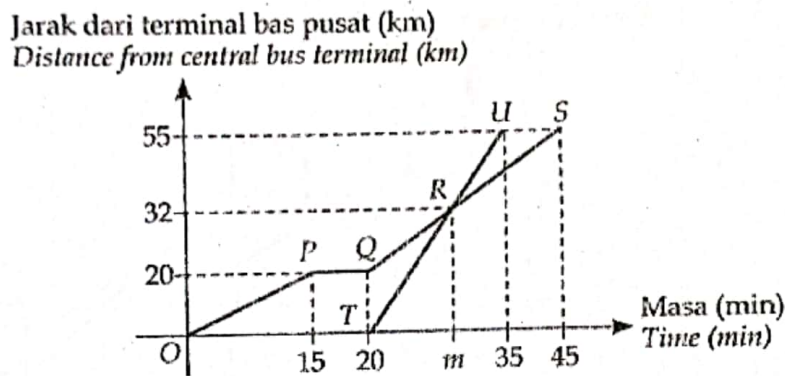
- (b) (i)

(ii)

(iii)

17. Graf jarak-masa dalam Rajah 17 menunjukkan perjalanan dua buah bas dari terminal bas pusat ke Stesen Z dengan menggunakan laluan yang sama.  $OPQRS$  mewakili perjalanan bas A manakala  $TRU$  mewakili perjalanan bas B. Bas A bertolak pada pukul 6:30 a.m. Dalam perjalanan, bas itu berhenti untuk mengambil beberapa penumpang. Bas B bertolak pada pukul 6:50 a.m. Kedua-dua bas bertemu di bandar R pada waktu  $m$ .

The distance-time graph in the Diagram 17 shows the journey of two buses from the central bus terminal to Station Z by using the same route.  $OPQRS$  represents the journey of bus A while  $TRU$  represents the journey of bus B. Bus A departs 6:30 a.m. During the journey, the bus stops to pick up some passengers. Bus B departs at 6:50 a.m. Both buses meet at town R at time  $m$ .



Rajah 17 / Diagram 17

- (a) (i) Nyatakan tempoh masa, dalam minit, bas A berhenti untuk mengambil penumpang.  
State the duration, in minutes, bus A stops to pick up the passengers.
- (ii) Hitung jarak, dalam km, yang dilalui oleh bas A apabila ia bertemu dengan bas B di bandar R.  
Calculate the distance, in km, travelled by bus A when it meets bus B at town R.
- (iii) Cari laju, dalam  $\text{kmj}^{-1}$ , bagi bas A selepas melalui bandar R. beri jawapan dalam 2 tempat perpuluhan.  
Find the speed, in  $\text{kmh}^{-1}$ , of bus A after passing through town R. Give the answer in 2 decimal places.

[6 markah / marks]

Jawapan / Answer :

(a) (i)

(ii)

(iii)

- (b) Alvin menaiki bas ke sekolah. Oleh kerana Alvin tinggal di kawasan pedalaman, hanya dua buah bas sahaja melalui kawasan tersebut sama ada bas *A* atau bas *B*. Ini menyebabkan Alvin kerap datang lewat ke sekolah. Kebarangkalian Alvin menaiki bas *A* ialah  $\frac{3}{5}$ . Jika dia menaiki bas *A*, kebarangkalian dia lewat ke sekolah ialah  $\frac{2}{7}$  dan jika dia menaiki bas *B*, kebarangkalian dia lewat ke sekolah ialah  $\frac{1}{8}$ .

*Alvin takes a bus to school. Since Alvin lives in a remote area, only two buses pass through the area either bus A or bus B. Due to this, Alvin is often late to school. The probability of Alvin taking bus A to school is  $\frac{3}{5}$ . If he takes bus A, the probability that he will be late for school is  $\frac{2}{7}$  and if he takes bus B, the probability that he will be late for school is  $\frac{1}{8}$ .*

- (i) Lengkapkan gambar rajah pokok untuk menunjukkan semua kesudahan yang mungkin.  
*Complete a tree diagram to show all the possible outcomes.*

- (ii) Cari kebarangkalian bahawa dia menaiki bas *A* dan lewat ke sekolah.  
*Find the probability that he travels by bus A and late for school.*

(iii) Cari kebarangkalian bahawa

*Find the probability that*

(a) dia lewat ke sekolah.

*he is late for school.*

(b) dia tidak lewat ke sekolah,

*he is not late for school.*

[9 markah / marks]

Jawapan / Answer :

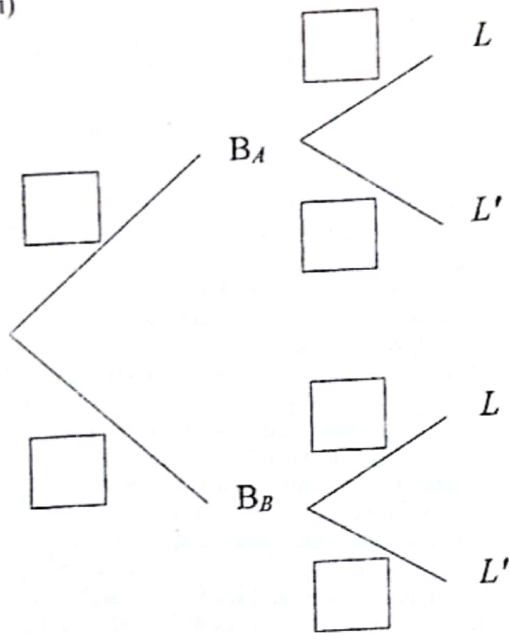
Bas A / Bus A =  $B_A$

Bas B / Bus B =  $B_B$

Lewat / Late =  $L$

Tidak lewat / Not late =  $L'$

(b) (i)



(ii)

(iii) (a)

(b)