

# **MODUL MATEMATIK SPM KBSM**

**PERCUBAAN SPM  
2020 TERENGGANU,  
KELANTAN, JOHOR  
DAN MELAKA**

MODUL INI DITUJUKAN UNTUK SELURUH  
PELAJAR SPM MATEMATIK KBSM.

9 NOVEMBER 2020 - 20 JANUARI 2021  
ADALAH MASA YANG SEWAJARNYA  
DIGUNAKAN UNTUK MEMPERBANYAK MEMBUAT  
LATIH TUBI. GUNAKAN PELUANG INI  
UNTUK MELATIH DIRI ANDA SUPAYA  
BERTAMBAH RAJIN.

DI DALAM MODUL INI DIISI DENGAN  
SOALAN PERCUBAAN SPM 2020 MATEMATIK  
BEBERAPA NEGERI SEPERTI TERENGGANU,  
KELANTAN, JOHOR DAN MELAKA.

HAK CIPTA BUKAN PADA SAYA KERANA  
SAYA CUMA MENGAMBIL SOALAN DARI  
NEGERI LAIN, BUKANNYA MEMBUAT SOALAN  
SENDIRI. MAKA, OLEH SEBAB ITU, MODUL  
INI BOLEH DICETAK/DIKONGSI KEPADA  
SESIAPA SAHAJA.

SEKIAN SAHAJA DARIPADA SAYA, PELAJAR  
SPM DARI SELANGOR.

## MATHEMATICAL FORMULAE RUMUS MATEMATIK

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

*Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.*

### RELATIONS PERKAITAN

1  $a^m \times a^n = a^{m+n}$

2  $a^m \div a^n = a^{m-n}$

3  $(a^m)^n = a^{mn}$

4  $A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$

5 Distance / Jarak

$$= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

6 Midpoint / Titik tengah

$$(x, y) = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

7 Average speed =  $\frac{\text{distance travelled}}{\text{time taken}}$

$$\text{Purata laju} = \frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$$

8 Mean =  $\frac{\text{sum of data}}{\text{number of data}}$

$$\text{Min} = \frac{\text{hasil tambah nilai data}}{\text{bilangan data}}$$

9 Mean =  $\frac{\text{sum of (classmark} \times \text{frequency)}}{\text{sum of frequencies}}$

$$\text{Min} = \frac{\text{hasil tambah (nilai titik tengah kelas} \times \text{kekerapan)}}{\text{hasil tambah kekerapan}}$$

10 Pythagoras Theorem  
Teorem Pithagoras

$$c^2 = a^2 + b^2$$

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

12  $P(A') = 1 - P(A)$

13  $m = \frac{y_2 - y_1}{x_2 - x_1}$

14  $m = -\frac{y\text{-intercept}}{x\text{-intercept}}$

$$m = -\frac{\text{pintasan} - y}{\text{pintasan} - x}$$

**SHAPES AND SPACE**  
**BENTUK DAN RUANG**

- 1 Area of trapezium =  $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$   
*Luas trapezium* =  $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$
- 2 Circumference of circle =  $\pi d = 2\pi r$   
*Lilitan bulatan* =  $\pi d = 2\pi r$
- 3 Area of circle =  $\pi r^2$   
*Luas bulatan* =  $\pi r^2$
- 4 Curved surface area of cylinder =  $2\pi rh$   
*Luas permukaan melengkung silinder* =  $2\pi rt$
- 5 Surface area of sphere =  $4\pi r^2$   
*Luas permukaan sfera* =  $4\pi r^2$
- 6 Volume of right prism = cross sectional area  $\times$  length  
*Isipadu prisma tegak* = *luas keratan rentas*  $\times$  *panjang*
- 7 Volume of cylinder =  $\pi r^2 h$   
*Isipadu silinder* =  $\pi r^2 t$
- 8 Volume of cone =  $\frac{1}{3} \pi r^2 h$   
*Isipadu kon* =  $\frac{1}{3} \pi r^2 t$
- 9 Volume of sphere =  $\frac{4}{3} \pi r^3$   
*Isipadu sfera* =  $\frac{4}{3} \pi r^3$
- 10 Volume of right pyramid =  $\frac{1}{3} \times \text{base area} \times \text{height}$   
*Isipadu piramid tegak* =  $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
- 11 Sum of interior angles of a polygon  
*Hasil tambah sudut pedalaman poligon*  
=  $(n - 2) \times 180^\circ$



$$12 \quad \frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{panjang lengkung}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$13 \quad \frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$14 \quad \text{Scale factor, } k = \frac{PA'}{PA}$$

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

$$15 \quad \text{Area of image} = k^2 \times \text{area of object}$$

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

# **TERENGGANU**

## ***KERTAS***

**1**

**Bahagian A**

Jawab **semua** soalan dalam bahagian ini..

- 1 Find the value of  $0.4593 + 0.8 \times 5.12$  and round off the answer correct to three significant figures.

*Cari nilai  $0.4593 + 0.8 \times 5.12$  dan bundarkan jawapan itu betul kepada tiga angka bererti.*

- A 4.46
- B 4.56
- C 4.555
- D 4.5553

- 2 Find the value of  $\frac{7.92 \times 10^{-2}}{(4 \times 10^{-3})^2}$

*Cari nilai  $\frac{7.92 \times 10^{-2}}{(4 \times 10^{-3})^2}$*

- A  $1.98 \times 10^3$
- B  $1.98 \times 10^4$
- C  $4.95 \times 10^3$
- D  $4.95 \times 10^4$

- 3 A car moved at a speed of  $120 \text{ kmh}^{-1}$ . Find the distance, in m, travelled by the car in 90 minutes.

*Sebuah kereta bergerak pada kelajuan  $120 \text{ kmj}^{-1}$ . Cari jarak, dalam m, yang dilalui oleh kereta dalam 90 minit.*

- A  $3 \times 10^3$
- B  $1.08 \times 10^4$
- C  $1.8 \times 10^5$
- D  $1.08 \times 10^7$

[Lihat halaman sebelah

- 4 Express  $1234_5$  as a number in base eight.

Ungkapkan  $1234_5$  sebagai nombor dalam asas lapan.

- A 302  
B 376  
C 1136  
D 2322

- 5 Given  $101110_2 - N = 1001_2$ , find the value of  $N$ .

Diberi  $101110_2 - N = 1001_2$ , cari nilai  $N$ .

- A  $100101_2$   
B  $101110_2$   
C  $110010_2$   
D  $111010_2$

- 6 In Diagram 1,  $PQRSTV$  is a regular hexagon.  $QVU$  and  $STU$  are straight lines.

Dalam Rajah 1,  $PQRSTV$  ialah sebuah heksagon sekata.  $QVU$  dan  $STU$  adalah garis lurus.

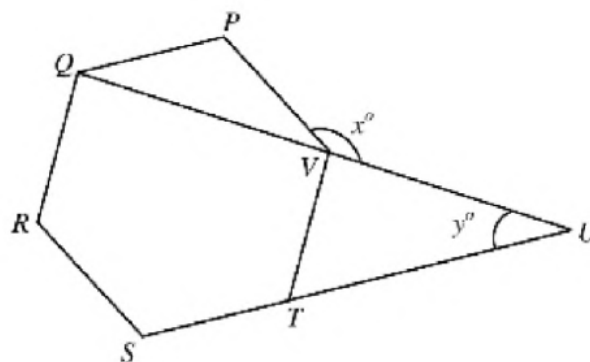


Diagram 1 / Rajah 1

Find the value of  $x + y$

Cari nilai  $x + y$

- A  $170^\circ$   
B  $180^\circ$   
C  $190^\circ$   
D  $200^\circ$

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**SULIT**

- 7 In Diagram 2,  $AB = AE$ ,  $BE = ED$  and  $BD = BC$ . Straight line  $ED$  is parallel to straight line  $BC$ .

Dalam Rajah 2,  $AB = AE$ ,  $BE = ED$  dan  $BD = BC$ . Garis lurus  $ED$  adalah selari dengan garis lurus  $BC$ .

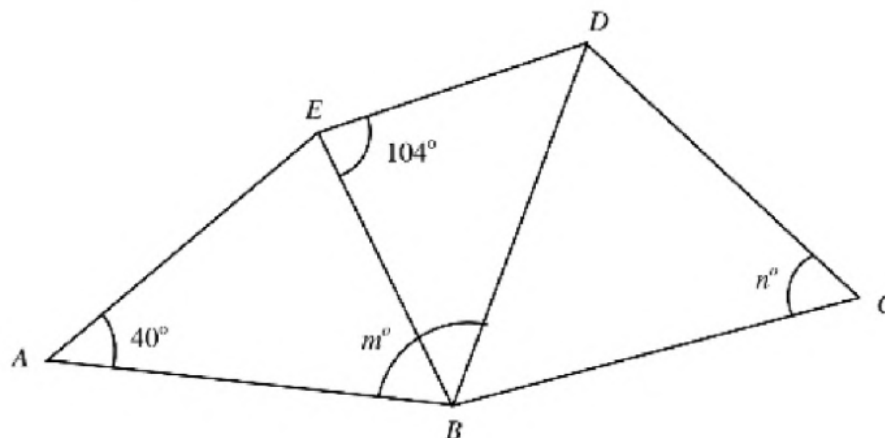


Diagram 2 / Rajah 2

Calculate the value of  $m - n$ .

Hitung nilai  $m - n$ .

- A  $32^\circ$
- B  $37^\circ$
- C  $40^\circ$
- D  $54^\circ$

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**SULIT**

- 8 In Diagram 3,  $XYZ$  is a tangent to the circle  $UVWY$ . The length of minor arc  $YV$  is equal to the length of minor  $YW$ .

*Dalam Rajah 3,  $XYZ$  ialah tangen kepada bulatan  $UVWY$ . Panjang lengkok minor  $YV$  adalah sama dengan panjang lengkok minor  $YW$ .*

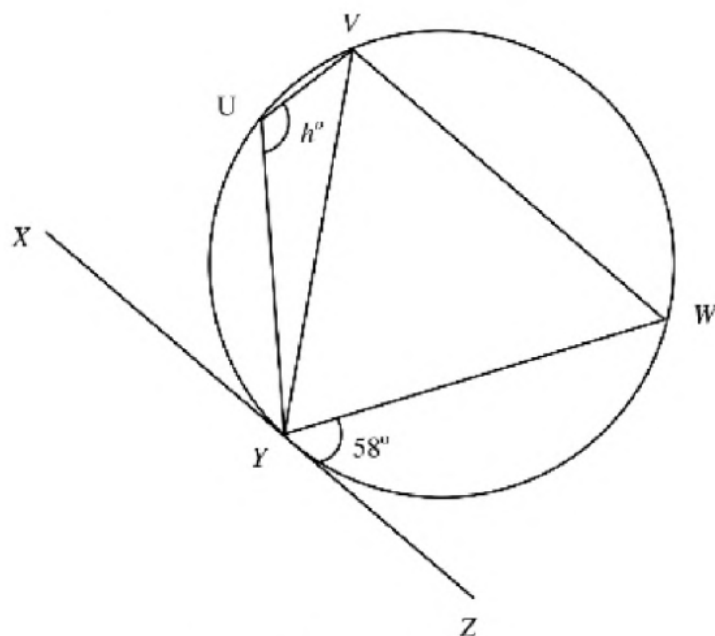


Diagram 3 / Rajah 3

Find the value of  $h$ .

*Cari nilai  $h$ .*

- A  $64^\circ$
- B  $90^\circ$
- C  $116^\circ$
- D  $122^\circ$

[Lihat halaman sebelah

**SULIT**

- 9 In Diagram 4,  $J$  is the image of  $K$  under a reflection.

*Dalam Rajah 4,  $J$  ialah imej bagi  $K$  di bawah satu pantulan.*

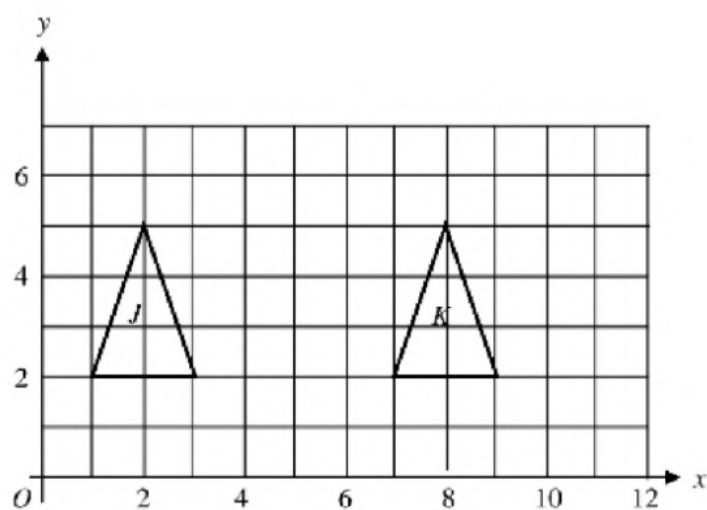


Diagram 4 / Rajah 4

The image of  $L(1, 1)$  under the same reflection is

*Imej bagi  $L(1, 1)$  di bawah satu pantulan yang sama ialah*

- A (10, 1)
- B (9, 1)
- C (8, 1)
- D (1, 10)

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**SULIT**

- 10  $\triangle PQR$  is the image of  $\triangle STU$  under an enlargement with a scale factor of  $x$  about the centre  $(-5, 6)$ . Given that the area of  $\triangle PQR$  and  $\triangle STU$  are  $200 \text{ cm}^2$  and  $50 \text{ cm}^2$  respectively, the value of  $x$  is

*$\triangle PQR$  ialah imej  $\triangle STU$  di bawah satu pembesaran dengan faktor skala  $x$  yang berpusat di  $(-5, 6)$ . Diberi bahawa luas  $\triangle PQR$  dan  $\triangle STU$  masing-masing ialah  $200 \text{ cm}^2$  dan  $50 \text{ cm}^2$ , nilai  $x$  ialah*

- A 5  
B 4  
C 3  
D 2

- 11 In Diagram 5,  $MPQ$  is a right-angled triangle.  
*Dalam Rajah 5,  $MPQ$  ialah sebuah segitiga bersudut tegak.*

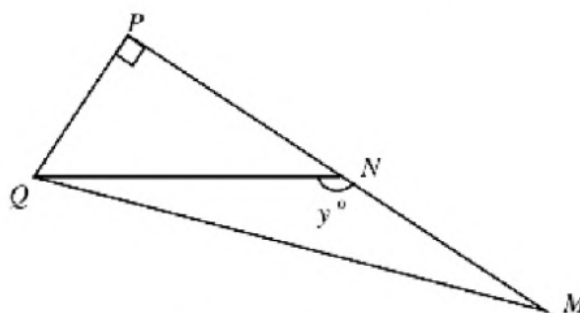


Diagram 5 / Rajah 5

It is given that  $QN = 13 \text{ cm}$ ,  $MP = 24 \text{ cm}$  and  $N$  is the midpoint of  $MP$ .  
Find the value of  $\tan y^\circ$ .

*Diberi bahawa  $QN = 13 \text{ cm}$ ,  $MP = 24 \text{ cm}$  dan  $N$  ialah titik tengah  $MP$ .  
Cari nilai  $\tan y^\circ$ .*

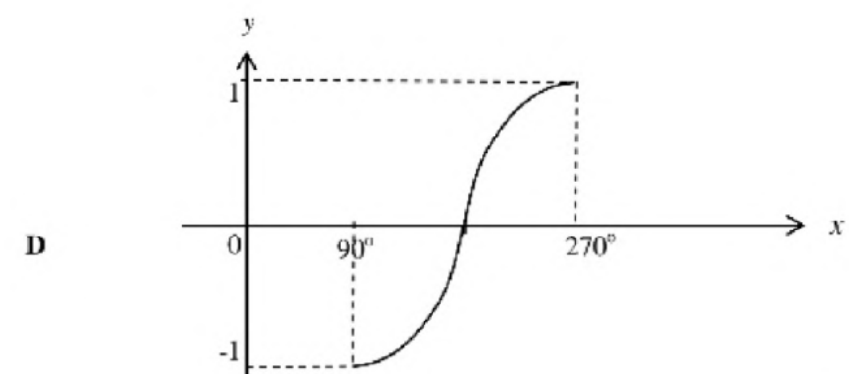
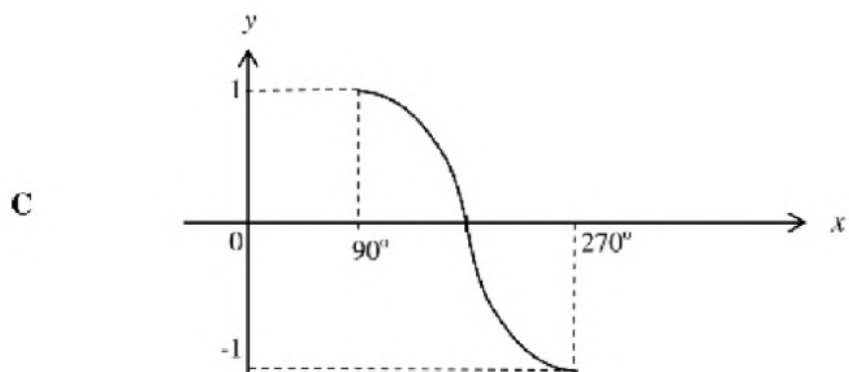
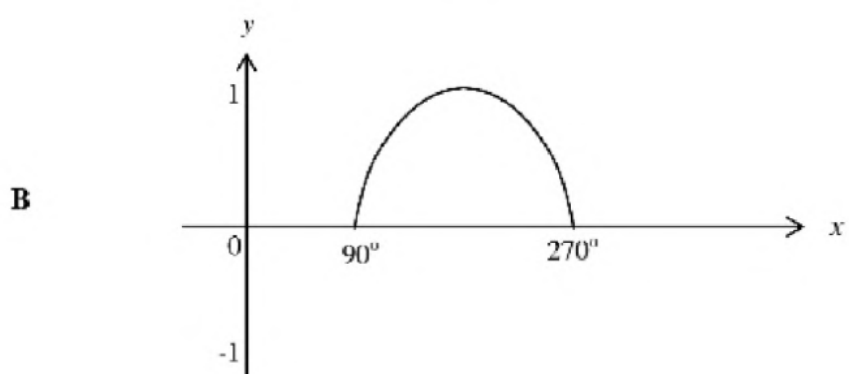
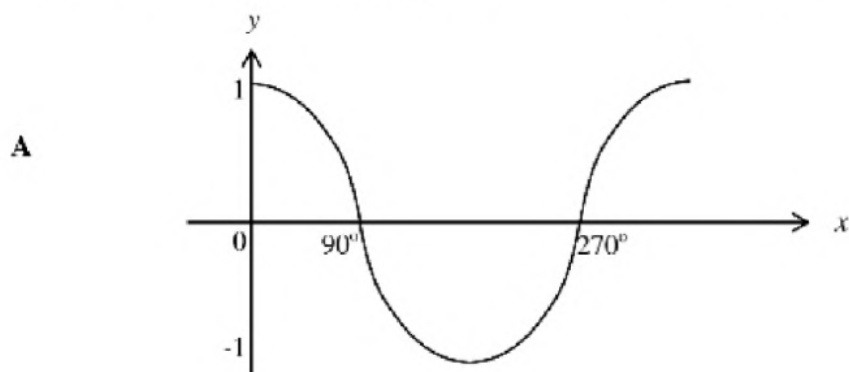
- A  $\frac{5}{13}$   
B  $\frac{12}{13}$   
C  $\frac{5}{12}$   
D  $\frac{13}{12}$

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**SULIT**



- 12 Which graph represents the graph of  $y = \sin x$  for  $90^\circ < x < 270^\circ$  ?  
*Graf manakah yang mewakili graf  $y = \sin x$  for  $90^\circ < x < 270^\circ$  ?*



[Lihat halaman sebelah  
**SULIT**

- 13 Diagram 6 shows a right prism with a horizontal base  $PQR$ . Right angled triangle  $PQR$  is the uniform cross-section of the prism such that  $\angle PQR = 90^\circ$ .

Rajah 6 menunjukkan sebuah prisma tegak dengan tapak mengufuk  $PQR$ . Segitiga bersudut tegak  $PQR$  adalah keratan rentas seragam bagi prisma tersebut dengan keadaan  $\angle PQR = 90^\circ$ .

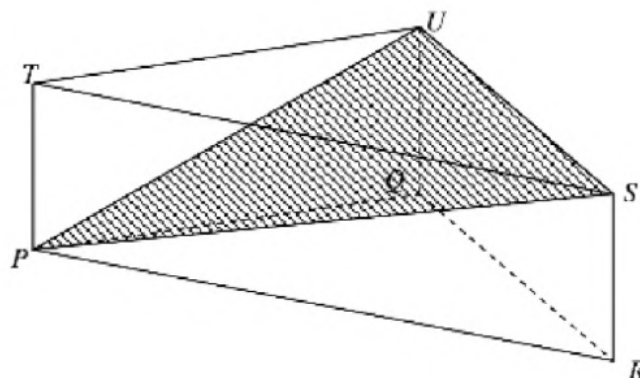


Diagram 6 / Rajah 6

Name the angle between the plane  $PSU$  and the plane  $TSU$ .

Namakan sudut antara satah  $PSU$  dengan satah  $TSU$ .

- A  $\angle PUT$
- B  $\angle PUS$
- C  $\angle PSU$
- D  $\angle PST$

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**SULIT**

- 14 Diagram 7 shows a regular hexagon  $RSTUVW$ , made by metal frame.

*Rajah 7 menunjukkan sebuah heksagon sekata  $RSTUVW$ , yang diperbuat daripada kerangka besi.*

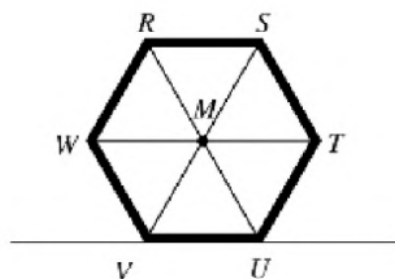


Diagram 7 / Rajah 7

$VU$  lies on horizontal plane and point  $M$  is a centre of the hexagon. Which of the following is the angle of depression from point  $M$ ?

*$VU$  terletak di atas satah mengufuk dan titik  $M$  ialah pusat heksagon. Antara berikut, yang manakah sudut tunduk dari titik  $M$ ?*

- A  $\angle SMT$
- B  $\angle WMV$
- C  $\angle RSM$
- D  $\angle MTU$

- 15 Diagram 8 shows two poles on a horizontal plane. The points  $P$ ,  $Q$  and  $R$  lie on the plane.

*Rajah 8 menunjukkan dua batang tiang di atas satah mengufuk. Titik-titik  $P$ ,  $Q$  dan  $R$  terletak pada satah itu.*

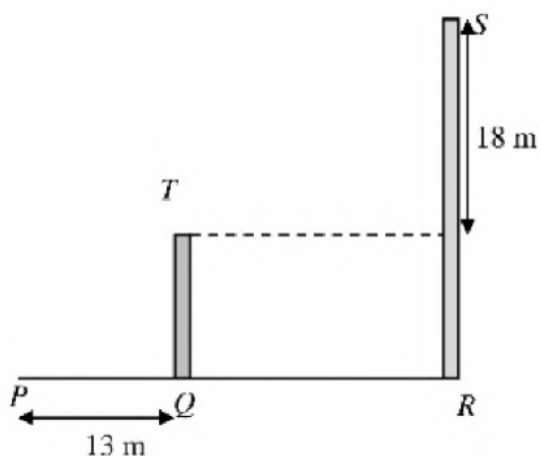


Diagram 8 / Rajah 8

The angles of elevation of vertex  $S$  from vertex  $T$  and point  $P$  are  $46^\circ$  and  $42^\circ$  respectively. Find the height in m, of pole  $RS$ .

*Sudut dongak puncak  $S$  dari puncak  $T$  dan titik  $P$  masing – masing ialah  $46^\circ$  dan  $42^\circ$ . Cari tinggi, dalam m, tiang  $RS$ .*

- A 27.35
- B 28.49
- C 29.71
- D 30.35

[Lihat halaman sebelah

- 16 Diagram 9 shows the position of the house of Amir, Asyraf, Aiman and Naim on a horizontal plane.

*Rajah 9 menunjukkan kedudukan rumah Amir, Asyraf, Aiman dan Naim pada suatu satah mengufuk.*

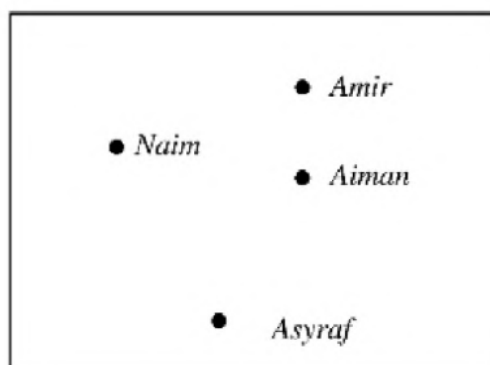


Diagram 9 / Rajah 9

Amir's house is due north of Aiman's house. The bearing of Asyraf's house from Naim's house is  $140^\circ$  and the bearing of Aiman's house from Asyraf's house is  $030^\circ$ . Given the distance of Asyraf's and Naim's house are equal to the distance of Aiman's and Naim's house. Find the bearing of Naim's house from Aiman's house.

*Rumah Amir terletak ke utara rumah Aiman. Bearing rumah Asyraf dari rumah Naim ialah  $140^\circ$  dan bearing rumah Aiman dari rumah Asyraf ialah  $030^\circ$ . Diberi jarak rumah Asyraf dan Naim adalah sama dengan jarak rumah Aiman dan Naim. Cari bearing rumah Naim dari rumah Aiman.*

- A  $080^\circ$
- B  $100^\circ$
- C  $280^\circ$
- D  $320^\circ$

[Lihat halaman sebelah

- 17 In Diagram 10,  $N$  is the North Pole,  $S$  is the South Pole and  $NOS$  is the axis of earth.  
 Dalam Rajah 10,  $N$  ialah Kutub Utara,  $S$  ialah Kutub Selatan dan  $NOS$  adalah paksi bumi.

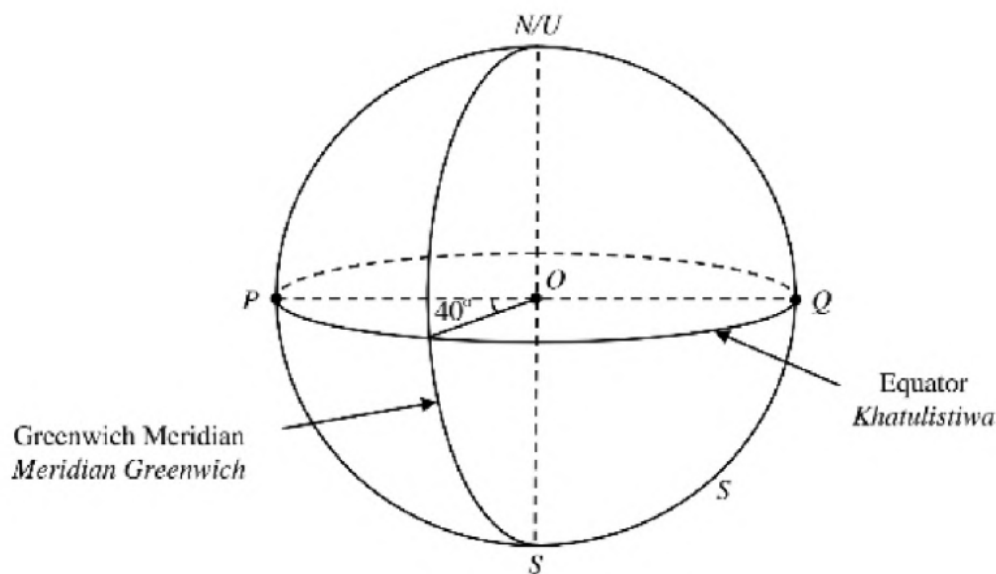


Diagram 10 / Rajah 10

Find the longitude of point  $Q$ .

Cari longitud titik  $Q$ .

- A**  $40^{\circ}E$   
 $40^{\circ}T$   
**B**  $40^{\circ}W$   
 $40^{\circ}B$   
**C**  $140^{\circ}E$   
 $140^{\circ}T$   
**D**  $140^{\circ}W$   
 $140^{\circ}B$

[Lihat halaman sebelah

**SULIT**

- 18 Express  $\frac{2x+6}{y-3} \div \frac{2(x+3)^2}{y^2-9}$  as a single fraction in its simplest form.

Ungkapkan  $\frac{2x+6}{y-3} \div \frac{2(x+3)^2}{y^2-9}$  sebagai satu pecahan tunggal dalam bentuk termudah.

A  $\frac{y+3}{x+3}$

B  $\frac{x+3}{y+3}$

C  $\frac{y-3}{x+3}$

D  $\frac{y}{x}$

- 19  $(p+q)(p-q) - (p-q)^2 =$

A  $2q+2q^2$

B  $2p-2q^2$

C  $2pq+2q^2$

D  $2pq-2q^2$

- 20 Given  $3m+4 = \frac{1}{2}(m-7)$ , find the value of  $m$ .

Diberi  $3m+4 = \frac{1}{2}(m-7)$ , cari nilai  $m$ .

A  $-3$

B  $-2$

C  $2$

D  $3$

[Lihat halaman sebelah

- 21 Diagram 11 shows the price of two types of fruits.

*Rajah 11 menunjukkan harga bagi dua jenis buah-buahan.*

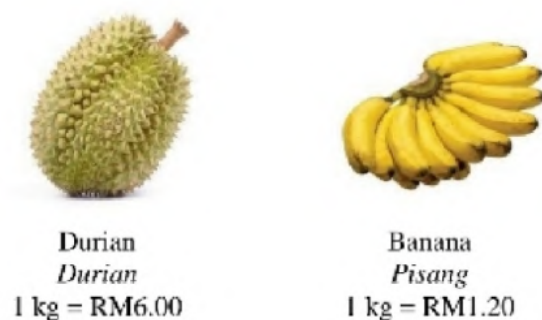


Diagram 11 / *Rajah 11*

Sabariah bought  $x$  kg of durian and  $y$  kg banana for RM48.00.

Write the equation for the mass of banana in terms of the mass of durian.

*Sabariah membeli  $x$  kg durian dan  $y$  kg pisang dengan harga RM48.00.*

*Tulis persamaan bagi jisim pisang dalam sebutan jisim durian.*

- A  $y = 40 - 5x$   
B  $y = 40 - 6x$   
C  $y = 48 - 6x$   
D  $y = 48 + 6x$

- 22 Simplify / *Permudahkan*

$$\left(3p^{-2}q^{\frac{1}{6}}\right)^2 \times \frac{q^{\frac{2}{3}}}{p^2}$$

- A  $6p^6q$   
B  $\frac{6p}{q^6}$   
C  $9p^6q$   
D  $\frac{9q}{p^6}$

[Lihat halaman sebelah

**SULIT**



- 23 The solution for  $\frac{1}{3}(x+2) \leq 4$  and  $6-x \leq 2$  is

*Penyelesaian bagi  $\frac{1}{3}(x+2) \leq 4$  dan  $6-x \leq 2$  ialah*

- A  $2 \leq x \leq 4$
- B  $4 \leq x \leq 6$
- C  $4 < x \leq 10$
- D  $4 \leq x \leq 10$

24. List all the integers  $x$  that satisfy the linear inequalities  $2-3x > 11$ .

*Senaraikan semua integer  $x$  yang memuaskan ketaksamaan linear  $2-3x > 11$ .*

- A  $-3, -2, -1, \dots$
- B  $-2, -1, 0, \dots$
- C  $-2, -3, -4, \dots$
- D  $-4, -5, -6, \dots$

- 25** Diagram 12 is a pictogram showing the number of bicycles produced by a factory Ashim in April and May. The number of bicycles produced in June and July are not shown.

*Rajah 12 menunjukkan piktogram bilangan basikal yang dihasilkan oleh sebuah kilang Asim dalam bulan April dan Mei. Bilangan basikal yang dihasilkan dalam bulan Jun dan Julai tidak ditunjukkan.*

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| April / April |        |
| May / Mei     |                                                                                                                                                                                                                                                                                                                                                 |
| June / Jun    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| July / Julai  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



represent 120 bicycle  
mewakili 120 basikal

Diagram 12 / Rajah 12

The number of bicycles produced in April and Jun are in the ratio 3 : 2. The number of bicycles produced in July was two times the number of bicycles produced in May. Calculate the total number of bicycles produced in June and July.

*Bilangan basikal yang dihasilkan pada bulan April dan Jun adalah dalam nisbah 3 : 2. Bilangan basikal yang dihasilkan dalam bulan Julai adalah dua kali bilangan basikal yang dihasilkan dalam bulan Mei.*

*Hitung jumlah bilangan basikal yang dihasilkan dalam bulan Jun dan Julai.*

- A 1140
- B 1200
- C 1220
- D 1280

[Lihat halaman sebelah

**SULIT**

- 26 Diagram 13 is a pie chart showing the monthly expenses of a family. The total expenditure for the household is RM 3600.

Rajah 13 ialah carta pai yang menunjukkan perbelanjaan bulanan bagi sebuah keluarga. Jumlah perbelanjaan bagi isi rumah itu ialah RM 3600.

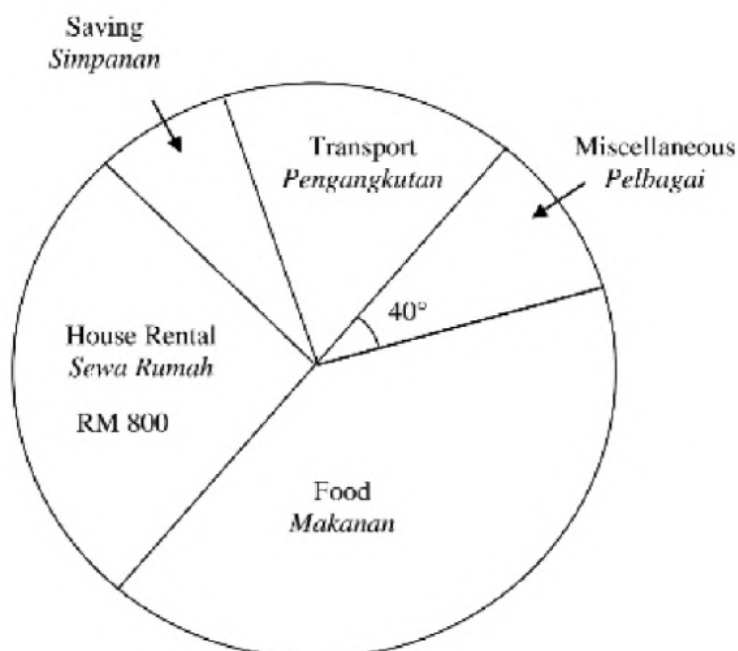


Diagram 13 / Rajah 13

It is given that the amount spent on transport, saving and food in the ratio 2 : 1 : 5.  
Find the amount spent on the food.

Diberi bahawa jumlah perbelanjaan pengangkutan, simpanan dan makanan adalah nisbah 2 : 1 : 5.

Cari jumlah perbelanjaan bagi makanan.

- A RM 300
- B RM 600
- C RM 1500
- D RM 2400

[Lihat halaman sebelah

**SULIT**

- 27 Table 1 shows the score of participants in a robotic competition.

*Jadual 1 menunjukkan skor yang diperolehi oleh peserta dalam satu pertandingan robotik.*

|                                |    |    |         |    |    |
|--------------------------------|----|----|---------|----|----|
| <b>Score<br/>Skor</b>          | 10 | 15 | 20      | 25 | 30 |
| <b>Frequency<br/>Kekerapan</b> | 10 | 8  | $x + 1$ | 16 | 9  |

Table 1 / *Jadual 1*

If the median score is 20, state the minimum value of  $x$ .

*Jika skor median ialah 20, nyatakan nilai minima bagi  $x$ .*

- A 6
- B 7
- C 8
- D 9

- 28 Diagram 14 shows a graph of  $y = ax^3 + c$ .

*Rajah 14 menunjukkan graf bagi  $y = ax^3 + c$ .*

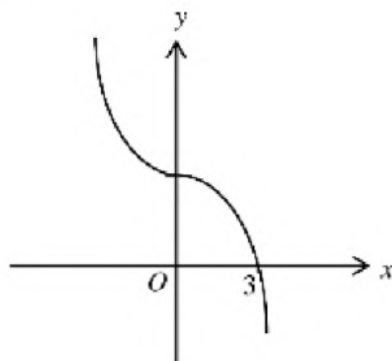


Diagram 14 / *Rajah 14*

Which of the following is the equation of the graph function?

*Antara berikut yang manakah persamaan bagi graf fungsi tersebut?*

- A  $y = x^3 + 3$
- B  $y = -x^3 + 3$
- C  $y = x^3 + 27$
- D  $y = -x^3 + 27$

[Lihat halaman sebelah

**SULIT**

29 Diagram 15 is a Venn diagram which shows  $\xi = J \cup K \cup L$ .

Rajah 15 ialah gambar rajah Venn yang menunjukkan  $\xi = J \cup K \cup L$ .

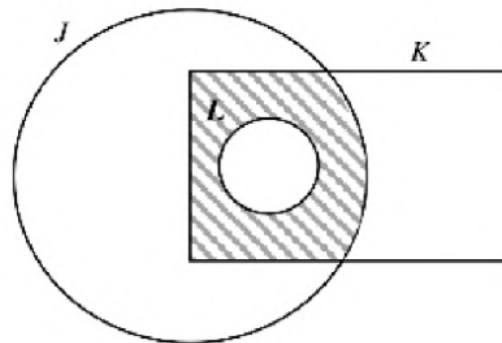


Diagram 15 / Rajah 15

Which of the following represents the shaded region?

Antara berikut yang manakah yang mewakili kawasan berlorek?

- A  $J \cap (L \cup K)'$
- B  $J \cap (L' \cap K)$
- C  $J \cup (L \cup K)'$
- D  $J \cup (L \cap K)'$

[Lihat halaman sebelah

**SULIT**

- 30** Diagram 16 is a Venn Diagram which shows the number of elements in universal set,  $\xi$ , set  $P$ , set  $Q$  and set  $R$ .

*Rajah 16 ialah gambar rajah Venn yang menunjukkan bilangan unsur dalam set semesta,  $\xi$ , set  $P$ , set  $Q$  dan set  $R$ .*

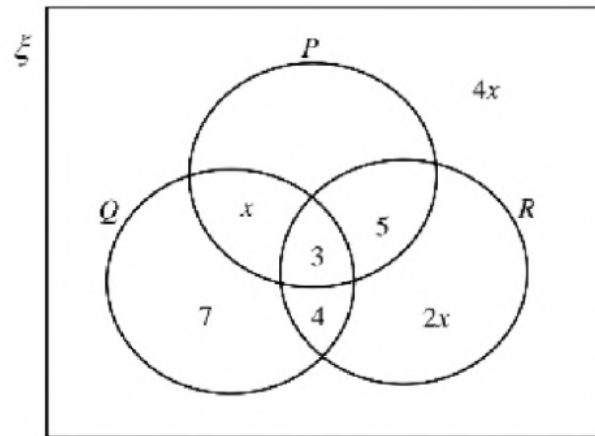


Diagram 16 / Rajah 16

Given  $n(P \cup Q)' = n(R)$ , find  $n(\xi)$ .

*Diberi  $n(P \cup Q)' = n(R)$ , cari  $n(\xi)$ .*

- A** 28
- B** 37
- C** 40
- D** 45

[Lihat halaman sebelah

**SULIT**

- 31 Diagram 17 is a Venn diagram which shows the number of students in a class and their favourite breakfast in set  $G$  and set  $L$ . It is given that the universal set,  $\xi = G \cup L$ , set  $G = \{\text{Nasi Goreng}\}$  and set  $L = \{\text{Nasi Lemak}\}$ .

*Rajah 17 menunjukkan gambarajah Venn yang menunjukkan bilangan pelajar di sebuah kelas dan sarapan kegemaran mereka dalam set  $G$  dan set  $L$ . Diberi bahawa set semesta,  $\xi = G \cup L$ , set  $G = \{\text{Nasi Goreng}\}$  dan set  $L = \{\text{Nasi Lemak}\}$ .*

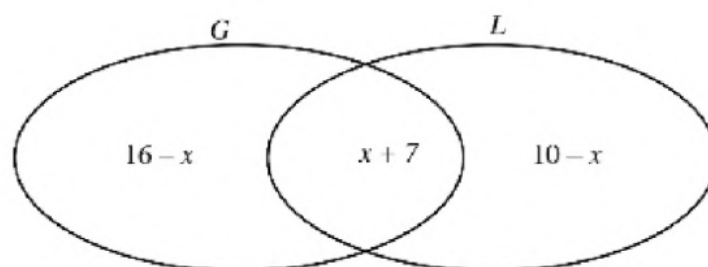


Diagram 17 / Rajah 17

If the number of students who like only one type of food is 10, find the total number of students in the class.

*Jika bilangan pelajar yang gemar makan satu jenis makanan sahaja ialah 10 orang, cari jumlah pelajar di dalam kelas itu.*

- A 19  
B 20  
C 25  
D 30
- 32 A straight line passes through point  $(3,4)$  and point  $(-3,0)$ . Find the y-intercept of the straight line.
- Satu garis lurus melalui titik  $(3,4)$  dan  $(-3,0)$ . Cari pintasan-y bagi garis lurus itu.*
- A 1  
B 2  
C 3  
D 4

[Lihat halaman sebelah

**SULIT**

- 33 Diagram 18 shows a stairs with the height of 3 m.

*Rajah 18 menunjukkan sebuah tangga dengan ketinggian 3 m.*

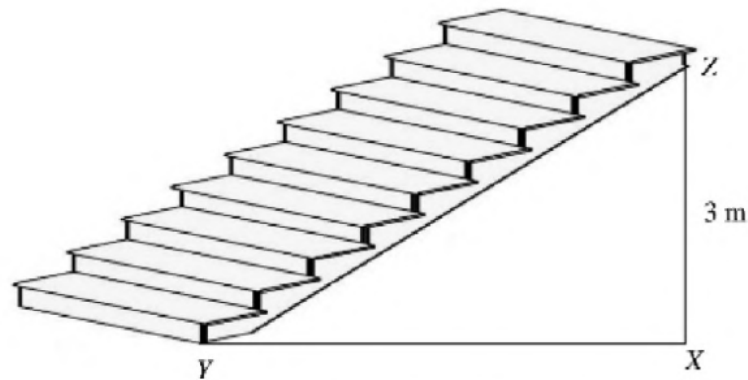


Diagram 18 / *Rajah 18*

Given the gradient of the stairs is  $\frac{1}{2}$ , find the distance of  $XY$ .

*Diberi kecerunan tangga ialah  $\frac{1}{2}$ , cari jarak  $XY$ .*

- A 3 m
- B 4 m
- C 6 m
- D 9 m



- 34** An equation for a straight line is  $3x - 5y = 10$ . Define the gradient and y-intercept of the straight line.

*Persamaan bagi suatu garis lurus ialah  $3x - 5y = 10$ . Tentukan kecerunan dan pintasan-y bagi garis lurus itu.*

|          | <b>Gradient</b><br><i>Kecerunan</i> | <b>y-intercept</b><br><i>Pintasan-y</i> |
|----------|-------------------------------------|-----------------------------------------|
| <b>A</b> | $-\frac{3}{5}$                      | 2                                       |
| <b>B</b> | $\frac{3}{5}$                       | -10                                     |
| <b>C</b> | $-\frac{3}{5}$                      | 10                                      |
| <b>D</b> | $\frac{3}{5}$                       | 2                                       |

- 35 Table 2 shows the number of students who attend a Motivation Programme.

*Jadual 2 menunjukkan bilangan murid yang mewakili suatu Program Motivasi.*

| <b>Gender</b><br><b>Class</b><br><b>Jantina</b> | <b>5 Anggur</b> | <b>5 Betik</b> | <b>5 Ciku</b> |
|-------------------------------------------------|-----------------|----------------|---------------|
| Boy<br><i>Lelaki</i>                            | 15              | 8              | 22            |
| Girl<br><i>Perempuan</i>                        | 20              | 17             | 18            |

Table 2 / *Jadual 2*

A student is selected at random from the programme. Find the probability that a boy from 5 Anggur is selected.

*Seorang murid dipilih secara rawak daripada program tersebut. Cari kebarangkalian bahawa seorang murid lelaki dari 5 Anggur dipilih.*

A  $\frac{3}{20}$

B  $\frac{7}{20}$

C  $\frac{1}{3}$

D  $\frac{3}{7}$

[Lihat halaman sebelah

**SULIT**

36

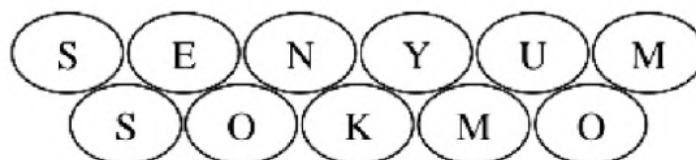


Diagram 19 / Rajah 19

Diagram 19 shows the alphabet cards are put into the empty box. A card is taken out at random from the box, state the probability that the card taken out is an alphabet S.

Rajah 19 menunjukkan kad-kad berhuruf yang dimasukkan ke dalam sebuah kotak kosong. Jika sekeping kad dikeluarkan secara rawak daripada kotak itu, nyatakan kebarangkalian bahawa kad yang dikeluarkan itu berhuruf S.

A  $\frac{1}{5}$

B  $\frac{1}{6}$

C  $\frac{2}{11}$

D  $\frac{2}{12}$

- 37  $T$  varies directly as the square root of  $U$  and  $T$  varies inversely as  $V$ . Given that the constant is  $k$ , which of the following equation represents the relation of  $T$ ,  $U$  and  $V$ ?

$T$  berubah secara langsung dengan punca kuasa dua  $U$  dan  $T$  berubah secara songsang dengan  $V$ . Diberi  $k$  ialah pemalar, antara berikut yang manakah mewakili hubungan antara  $T$ ,  $U$  dan  $V$ ?

A  $T = \frac{k\sqrt{U}}{V}$

B  $T = \frac{k\sqrt{U^2}}{V}$

C  $T = kU^2V$

D  $T = \frac{kV}{U}$

[Lihat halaman sebelah

**SULIT**

- 38** Table 3 shows some values of the variables  $M$  and  $N$ .

*Jadual 3 menunjukkan beberapa nilai pemboleh ubah  $M$  dan  $N$ .*

|     |                 |     |
|-----|-----------------|-----|
| $M$ | 96              | $p$ |
| $N$ | $\frac{1}{144}$ | 256 |

Table 3 / *Jadual 3*

It is given that  $M$  varies inversely as square root of  $N$ .

Calculate the value of  $p$ .

*Diberi bahawa  $M$  berubah secara songsang dengan punca kuasa dua  $N$ .*

*Hitung nilai  $p$ .*

- A**  $\frac{1}{2}$
- B**  $\frac{1}{4}$
- C**  $\frac{1}{8}$
- D**  $\frac{1}{16}$

39  $\begin{pmatrix} 8 & 1 \\ 3 & -5 \end{pmatrix} - 3\begin{pmatrix} -2 & 4 \\ 2 & 0 \end{pmatrix} + \begin{pmatrix} 1 & 5 \\ -4 & 3 \end{pmatrix} =$

A  $\begin{pmatrix} 15 & -6 \\ -7 & 2 \end{pmatrix}$

B  $\begin{pmatrix} 15 & -6 \\ -7 & -2 \end{pmatrix}$

C  $\begin{pmatrix} 15 & -6 \\ 7 & 2 \end{pmatrix}$

D  $\begin{pmatrix} 15 & 6 \\ -7 & 8 \end{pmatrix}$

40 It is given that the inverse matrix of  $\begin{pmatrix} 8 & 5 \\ -4 & -2 \end{pmatrix}$  is  $\frac{1}{s}\begin{pmatrix} -2 & t \\ 4 & 8 \end{pmatrix}$ .

Calculate the value of  $s - t$ .

*Diberi matriks songsang bagi  $\begin{pmatrix} 8 & 5 \\ -4 & -2 \end{pmatrix}$  ialah  $\frac{1}{s}\begin{pmatrix} -2 & t \\ 4 & 8 \end{pmatrix}$ .*

*Cari nilai  $s - t$ .*

A  $-9$

B  $-1$

C  $1$

D  $9$

END OF QUESTIONS  
KERTAS SOALAN TAMAT

*Skema*

**TERENGGANU**

***KERTAS***

**1**

**SKEMA PERMARKAHAN**  
**MPP 3 / TAHUN 2020**  
**SIJIL PELAJARAN MALAYSIA**

**MATEMATIK KERTAS 1**

|    |          |    |          |    |          |    |          |
|----|----------|----|----------|----|----------|----|----------|
| 1  | <b>B</b> | 11 | <b>C</b> | 21 | <b>A</b> | 31 | <b>C</b> |
| 2  | <b>C</b> | 12 | <b>C</b> | 22 | <b>D</b> | 32 | <b>B</b> |
| 3  | <b>C</b> | 13 | <b>A</b> | 23 | <b>D</b> | 33 | <b>C</b> |
| 4  | <b>A</b> | 14 | <b>B</b> | 24 | <b>D</b> | 34 | <b>D</b> |
| 5  | <b>A</b> | 15 | <b>A</b> | 25 | <b>D</b> | 35 | <b>A</b> |
| 6  | <b>B</b> | 16 | <b>C</b> | 26 | <b>C</b> | 36 | <b>C</b> |
| 7  | <b>B</b> | 17 | <b>C</b> | 27 | <b>B</b> | 37 | <b>A</b> |
| 8  | <b>D</b> | 18 | <b>A</b> | 28 | <b>D</b> | 38 | <b>A</b> |
| 9  | <b>B</b> | 19 | <b>D</b> | 29 | <b>B</b> | 39 | <b>B</b> |
| 10 | <b>D</b> | 20 | <b>A</b> | 30 | <b>A</b> | 40 | <b>D</b> |

# **KELANTAN**

## ***KERTAS***

**1**



Answer **all** questions

Jawab **semua** soalan.

1.  $m$  is rounded off correct to three significant figures to be 5.41. Which of the following is the possible value of  $m$ ?

*$m$  dibundarkan betul kepada tiga angka bererti menjadi 5.41. Antara yang berikut, yang manakah adalah nilai  $m$  yang mungkin?*

- A 5.4002
- B 5.4035
- C 5.4173
- D 5.4085

2. Express  $\frac{301}{25\,000}$  in standard form.

*Ungkapkan  $\frac{301}{25\,000}$  dalam bentuk piawai.*

- A  $0.1204 \times 10^{-2}$
- B  $1.204 \times 10^{-2}$
- C  $0.1204 \times 10^{-3}$
- D  $1.204 \times 10^{-3}$

3. Given  $59\,020\,000 = p \times 10^q$ , where  $p \times 10^q$  is a number in standard form. State the value of  $p$  and of  $q$ .

*Diberi  $59\,020\,000 = p \times 10^q$ , di mana  $p \times 10^q$  ialah nombor dalam bentuk piawai.*

*Nyatakan nilai  $p$  dan nilai  $q$ .*

- A  $p = 5.902, q = -8$
- B  $p = 5.902, q = -7$
- C  $p = 5.902, q = 7$
- D  $p = 5.902, q = 8$

4. The weight of an A4 paper is 0.0049896 kg. If a ream contains 500 sheets of A4 paper, what is the weight, in g, of 100 reams of A4 paper in standard form?  
*Jisim sehelai kertas A4 ialah 0.0049896 kg. Jika 1 rim mengandungi 500 helai kertas A4, berapakah berat, dalam g, 100 rim kertas A4 dalam bentuk piawai?.*

- A  $2.4948 \times 10^2$
- B  $2.4948 \times 10^3$
- C  $2.4948 \times 10^4$
- D  $2.4948 \times 10^5$

5.  $6050402_8 =$

- A.  $6 \times 8^4 + 5 \times 8^3 + 4 \times 8^2 + 2 \times 8^1$
- B.  $6 \times 8^7 + 5 \times 8^5 + 4 \times 8^3 + 2 \times 8^1$
- C.  $6 \times 8^6 + 5 \times 8^4 + 4 \times 8^2 + 2 \times 8^1$
- D.  $6 \times 8^6 + 5 \times 8^4 + 4 \times 8^2 + 2 \times 8^0$

6. Given  $1100_2 < x_{10} < 10001_2$ , the possible value of x is

*Diberi  $1100_2 < x_{10} < 10001_2$ , nilai yang mungkin bagi x ialah*

- A. 10
- B. 11
- C. 15
- D. 20

7. In diagram 1, ABCDEF is a regular hexagon. AFG and BDH are straight lines.

*Dalam Rajah 1, ABCDEF ialah sebuah heksagon sekata. AFG dan BDH ialah garis lurus.*

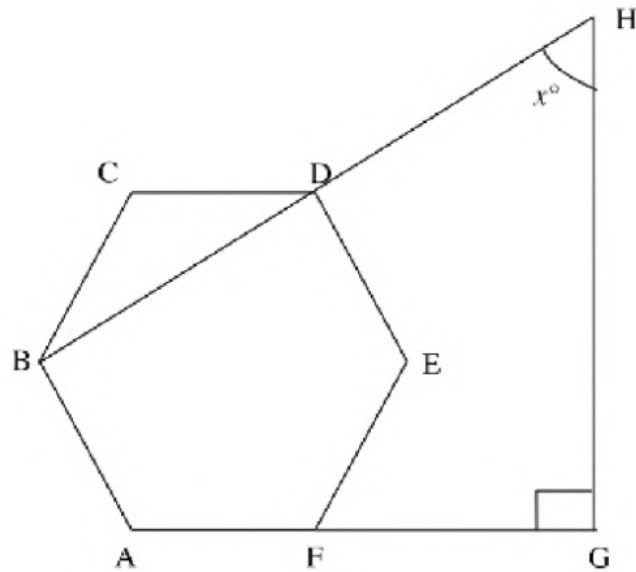


Diagram 1 / Rajah 1

Find the value of  $x$

*Cari nilai  $x$*

- A 60
- B 65
- C 70
- D 55

8. Diagram 2, shows a circle JKL with centre O. MLN is a tangent to the circle at L.

Rajah 2, menunjukkan sebuah bulatan JKL dengan pusat O. MLN ialah tangen kepada bulatan pada L.

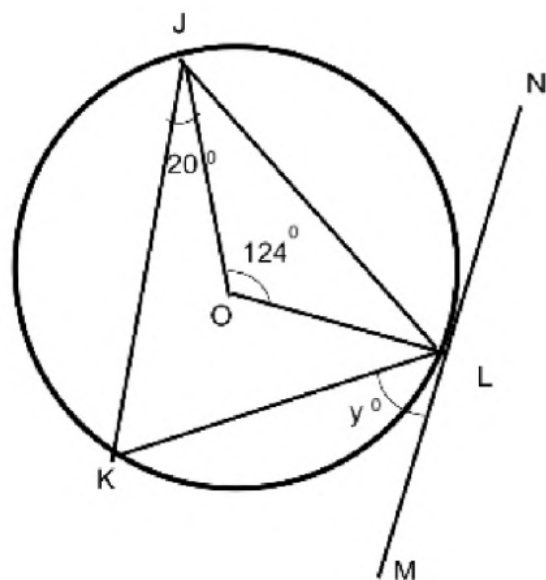


Diagram 2 / Rajah 2

Find the value of y

Cari nilai y.

- A 48
- B 36
- C 63
- D 75

9. In Diagram 3, which the dot A, B, C and D are image for dot P under a reflection of line RS.

*Dalam Rajah 3 , antara titik A, B, C dan D, yang manakah imej bagi titik P di bawah suatu pantulan pada garis RS..*

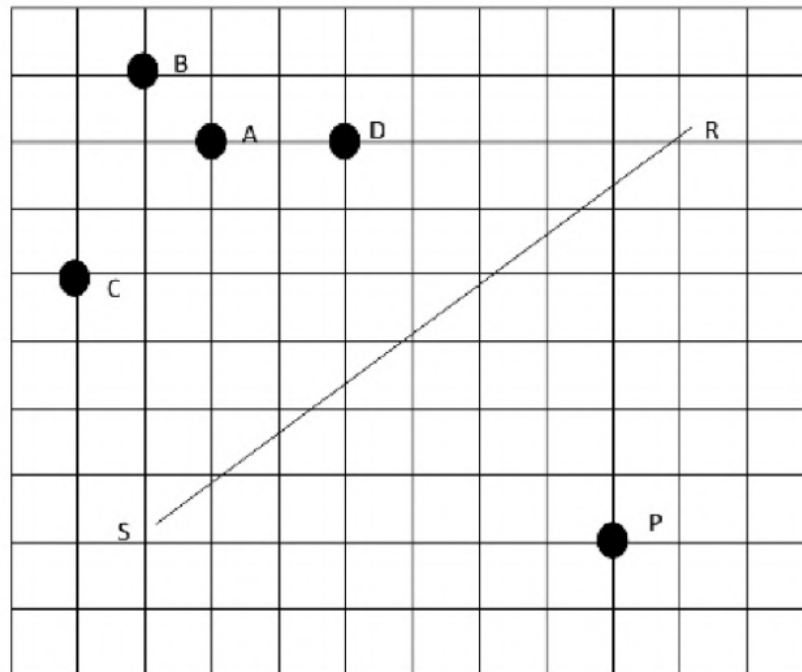


Diagram 3 / Rajah 3

10. The position of the Bahar table in class 5 Anggerik is at coordinates  $(-1, 2)$ . Mr Rahim has transferred Bahar's position according to the translation  $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$ . Bahar's declining achievement in the March Test caused his class teacher to change Bahar's position again according to the translation  $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ . What are the coordinates of Bahar's current position?

*Kedudukan meja Bahar dalam kelas 5 Anggerik adalah pada koordinat  $(-1, 2)$ . Cikgu Rahim telah memindahkan kedudukan Bahar mengikut translasi  $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$ . Pencapaian merosot Bahar dalam Ujian Mac membuatkan guru kelasnya mengubah sekali lagi kedudukan Bahar mengikut translasi  $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ . Berapakah koordinat kedudukan Bahar sekarang?*

- |           |          |
|-----------|----------|
| A (4, 5)  | B (4, 4) |
| C (4, -1) | D (0, 5) |

11. In Diagram 4, shows the graphs of  $y = \sin x$  for  $0^\circ \leq x \leq 360^\circ$ .

*Rajah 4, menunjukkan graf bagi  $y = \sin x$  untuk  $0^\circ \leq x \leq 360^\circ$ .*

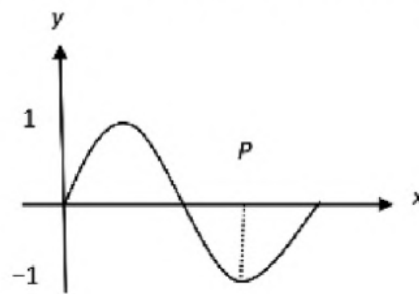


Diagram 4 / Rajah 4

Find the value of  $p$

*Cari nilai  $p$*

- A 210
- B 240
- C 270
- D 30

12. In diagram 5, PR and QS are straight lines. M and R are the midpoints of PR and QS respectively.

*Dalam rajah 5, PR dan QS ialah garis lurus. M dan R masing-masing adalah titik tengah bagi PR dan QS.*

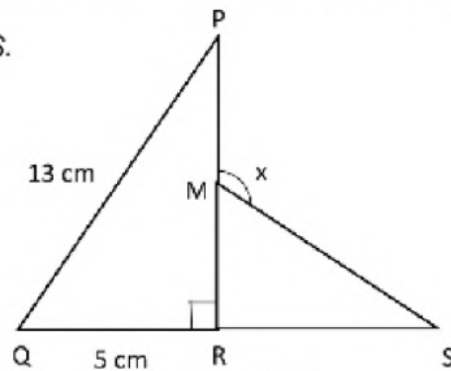


Diagram 5 / Rajah 5

Find  $\tan x$

*Cari  $\tan x$*

- |                 |                  |
|-----------------|------------------|
| A $\frac{6}{5}$ | B $-\frac{6}{5}$ |
| C $\frac{5}{6}$ | D $-\frac{5}{6}$ |

13. Diagram 6, shows a cuboid with a horizontal base  $JMRS$ .

*Rajah 6, menunjukkan sebuah kuboid dengan tapak mengufuk  $JMRS$ .*

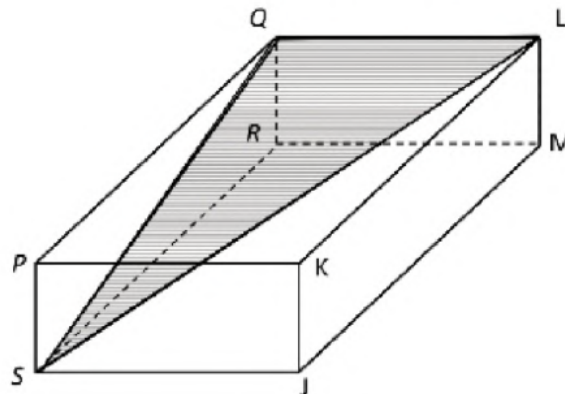


Diagram 6 / *Rajah 6*

Name the angle between the plane  $LMRQ$  and the plane  $LQS$ ?

*Namakan sudut di antara satah  $LMRQ$  dengan satah  $LQS$ ?*

- A  $\angle SQR$
- B  $\angle QSL$
- C  $\angle QLS$
- D  $\angle QSR$

14. In Diagram 7,  $GH$  and  $JM$  are two vertical poles on a horizontal plane.

*Rajah 7,  $GH$  dan  $JM$  adalah dua tiang tegak pada satah mengufuk.*

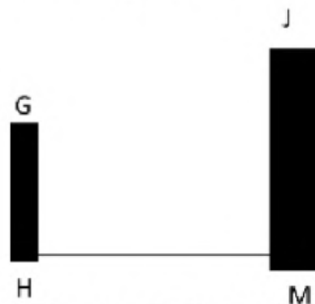


Diagram 7 / *Rajah 7*

The angle of elevation of point  $J$  from point  $H$  is

*Sudut dongak bagi titik  $J$  dari titik  $H$  adalah*

- A  $\angle JGM$
- B  $\angle JHM$
- C  $\angle GJH$
- D  $\angle GMH$

15. Kumar standing at the balcony on the 6th floor of a building. The height of one storey of the building is 6 m. There is a car and a bicycle parked on the horizontal ground. Given that the angle of depression of the car and bicycle from Kumar's point of view is  $30^\circ$  and  $45^\circ$  respectively. Calculate the distance, in m, from car to bicycle.

*Kumar berdiri di balkoni di tingkat 6 sebuah bangunan. Tinggi satu tingkat bangunan itu ialah 6 m. Terdapat sebuah kereta dan sebuah basikal yang diletakkan di atas tanah mengufuk. Diberi bahawa sudut tunduk kereta dan basikal dari mata Kumar masing-masing ialah  $30^\circ$  dan  $45^\circ$ . Hitung jarak, dalam m, dari kereta ke basikal.*

- A 62.35
- B 36
- C 26.35
- D 9.86

16. Diagram 8, shows the positions of point P and Q.

*Rajah 8, menunjukkan kedudukan titik P dan titik Q.*

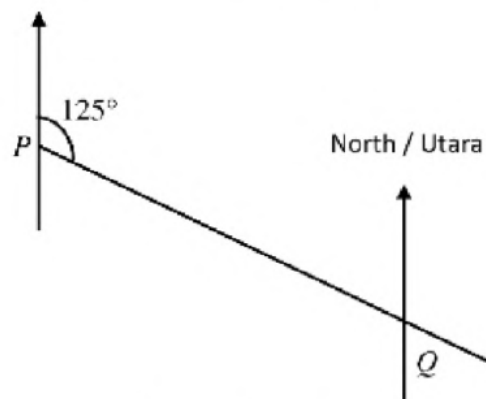


Diagram 8 / Rajah 8

Find the bearing of P from Q.

*Cari bearing P dari Q.*

- A  $315^\circ$
- B  $305^\circ$
- C  $125^\circ$
- D  $055^\circ$



17. In Diagram 9,  $N$  is the North Pole and  $S$  is the South Pole.  $PM = MS$ .

*Dalam Rajah 9,  $U$  ialah Kutub Utara dan  $S$  ialah Kutub Selatan.  $PM = MS$ .*

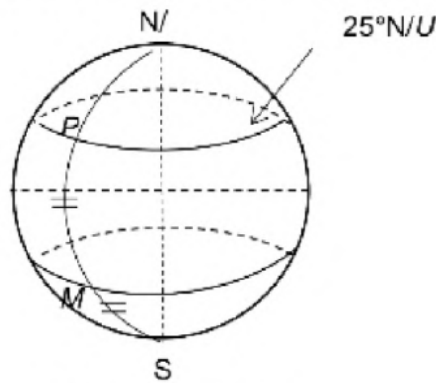


Diagram 9 / Rajah 9

Find the latitude of  $M$ .

*Cari latitude  $M$ .*

- A  $25^\circ S$
- B  $32.5^\circ S$
- C  $45^\circ S$
- D  $57.5^\circ S$

18. Factorise  $36x - 4xy^2$  completely.

*Faktorkan  $36x - 4xy^2$  selengkapnya*

- A  $4(9x - xy^2)$
- B  $4x(9 - y)^2$
- C  $9x(4 - y^2)$
- D  $4x(3 + y)(3 - y)$

19. Express  $\frac{2mn+4n}{9-n^2} \div \frac{6mn}{3-n}$  as a single fraction in its simplest form.

*Ungkapkan  $\frac{2mn+4n}{9-n^2} \div \frac{6mn}{3-n}$  sebagai satu pecahan tunggal dalam bentuk termudah.*

- A  $\frac{3m(3-n)}{m+2}$
- B  $\frac{3m(3+n)}{m+2}$
- C  $\frac{m+2}{3m(3-n)}$
- D  $\frac{m+2}{3m(3+n)}$

20. Given that  $P = \frac{5}{\sqrt{Q+R}}$ , express  $Q$  in terms of  $P$  and  $R$ .

Diberi bahawa  $P = \frac{5}{\sqrt{Q+R}}$ , ungkapkan  $Q$  dalam sebutan  $P$  dan  $R$ .

A  $\frac{5}{P^2} - R$

B  $\frac{5-R}{P^2}$

C  $\frac{25}{P^2} - R$

D  $\frac{25-R}{P^2}$

21. Given that  $3 - \frac{2(x-1)}{3} = \frac{x}{2}$ , find the value of  $x$ .

Diberi bahawa  $3 - \frac{2(x-1)}{3} = \frac{x}{2}$ , cari nilai  $x$ .

A  $\frac{17}{7}$

B  $\frac{22}{7}$

C  $\frac{14}{5}$

D  $\frac{22}{5}$

22. Simplify  $(a^2b^5)^{\frac{1}{2}} \times (a^{-4}b^{\frac{3}{2}})$ .

Ringkaskan  $(a^2b^5)^{\frac{1}{2}} \times (a^{-4}b^{\frac{3}{2}})$ .

A  $\frac{b^7}{a^2}$

B  $\frac{b^4}{a^3}$

C  $\frac{b^4}{a^2}$

D  $\frac{b^2}{a^3}$

23. Given  $a < x \leq b$ , find the values of  $a$  and  $b$  which satisfies both the inequalities

$$1 - 3x < 7 \text{ and } 4x - 8 \leq 20.$$

*Diberi  $a < x \leq b$ , cari nilai yang mungkin bagi  $a$  dan  $b$  yang memuaskan kedua-dua ketaksamaan  $1 - 3x < 7$  dan  $4x - 8 \leq 20$ .*

- A.  $a = -3, b = 7$
- B.  $a = -2, b = 6$
- C.  $a = -1, b = 6$
- D.  $a = -2, b = 7$

24. List all the integers  $r$  that satisfy the inequalities  $-12 - 2r \leq 4r - 6 < r$

*Senaraikan semua integer  $r$  yang memuaskan ketaksamaan  $-12 - 2r \leq 4r - 6 < r$*

- A.  $-2, -1, 0, 1, 2$
- B.  $-2, -1, 0, 1$
- C.  $-1, 0, 1, 2$
- D.  $-1, 0, 1$

25. Table 1, shows the number of members in five societies in SMK Durian Runtuh.

*Jadual 1, menunjukkan bilangan ahli dalam lima persatuan di SMK Durian Runtuh.*

| Societies/ Persatuan   | Number/Bilangan |
|------------------------|-----------------|
| Mathematics/ Matematik | 100             |
| History/ Sejarah       | 60              |
| Language/ Bahasa       | 80              |
| Science/ Sains         | 50              |
| Geography/ Geografi    | 70              |

Table 1 /Jadual 1

If the information given was represented by a pie chart, find the angle that represents the number of members in History Society and Language Society.

*Jika maklumat yang diberikan itu diwakili oleh sebuah carta pai, cari sudut yang mewakili bilangan ahli dalam Persatuan Sejarah dan Persatuan Bahasa.*

- A       $60^\circ$                       B       $80^\circ$   
C       $140^\circ$                       D       $160^\circ$

26. Table 2, shows a set of data

*Rajah 2, menunjukkan satu set data*

|    |    |    |   |
|----|----|----|---|
| 11 | 10 | 5  | 5 |
| 6  | 5  | 5  | 7 |
| 4  | 6  | 11 | 3 |

Table 2 /Jadual 2

Find the mean of the data.

*Cari min bagi data itu.*

- A      6.5  
B      7  
C      7.5  
D      8

27. Diagram 10, is a bar chart showing the number of marbles in three boxes, L, M, and N. The number of mables in box S is not shown.

*Rajah 10, ialah carta palang yang menunjukkan bilangan guli di dalam tiga buah kotak, L, M dan N. Bilangan guli di dalam kotak S tidak ditunjukkan.*

Number of mables/  
Bilangan guli

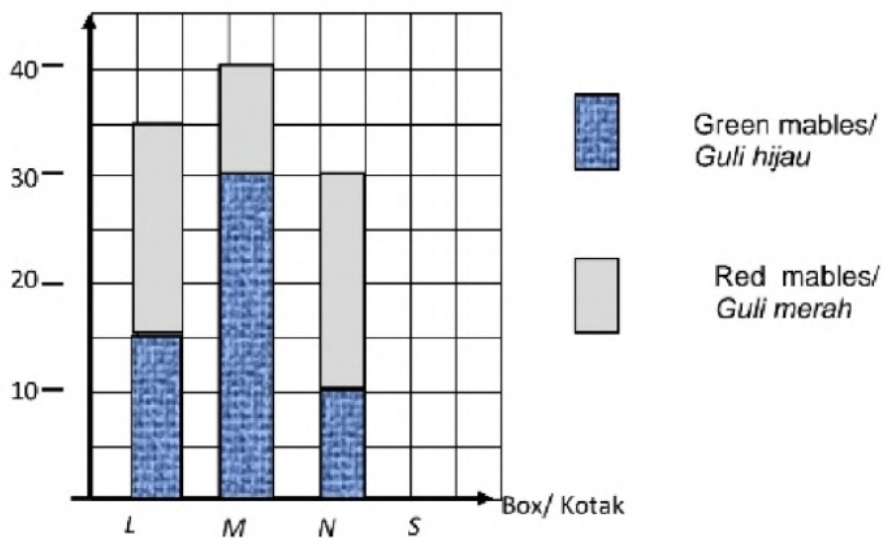


Diagram 10 / Rajah 10

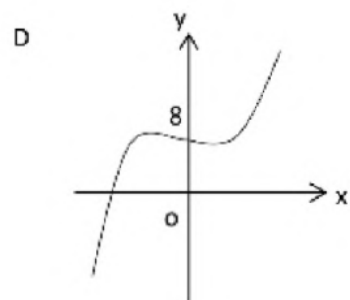
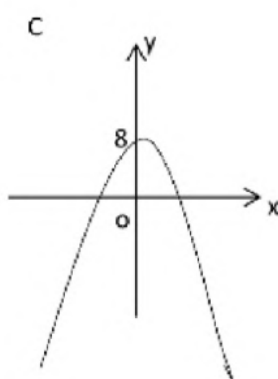
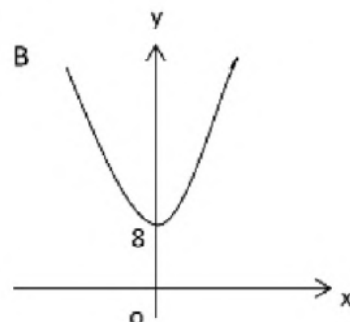
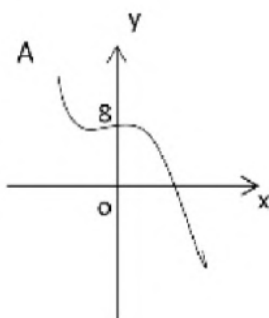
The total number of marbles in box S 50% more than the number of red mables in box M. Find the percentage of the number of marbles in the four boxes.

*Jumlah guli di dalam kotak S ialah 50% lebih daripada bilangan guli merah di dalam kotak M. Cari peratus bilangan guli di dalam kotak S daripada jumlah guli di dalam ke empat-empat kotak itu.*

- A 12.5
- B 25
- C 30
- D 40

28. Which of the following graph represents  $y = x^3 + 8$

*Antara berikut yang manakah mewakili graf  $y = x^3 + 8$*



29. Given  $S = \{x : x \text{ is an integer and } x < 9\}$  and  $T = \{x : x \text{ is an odd number and } x \geq 3\}$ .

State  $S \cap T$ .

*Diberi  $S = \{x : x \text{ ialah integer dan } x < 9\}$  dan  $T = \{x : x \text{ ialah nombor ganjil dan } x \geq 3\}$ .*

*Nyatakan  $S \cap T$ .*

- A  $\{3, 5, 7\}$
- B  $\{3, 5, 7, 9\}$
- C  $\{-7, -5, -3, 3, 5, 7\}$
- D  $\{-7, -5, -3, 3, 5, 7, 9\}$

30. Venn diagram in Diagram 11, shows the number of elements in sets K and L.

Gambar rajah Venn dalam Rajah 11, menunjukkan bilangan unsur dalam set K dan set L.

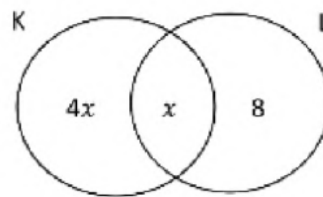


Diagram 11 / Rajah 11

Given  $\xi = K \cup L$  and  $n(L) = 20$ , find  $n(K \cup L)$ .

Diberi  $\xi = K \cup L$  dan  $n(L) = 20$ , cari  $n(K \cup L)$ .

- A 6
- B 20
- C 24
- D 68

31. Diagram 12 is a Venn diagram that shows the universal set,  $\xi$ , set A dan set B.

Rajah 12 ialah gambar rajah Venn yang menunjukkan set semesta,  $\xi$ , set A dan set B.

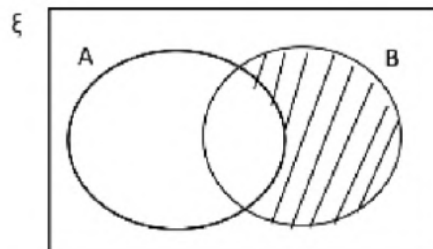


Diagram 12 / Rajah 12

The shaded region represents set

Kawasan berlorek mewakili set

- A  $A \cap B$
- B  $B \cap A'$
- C  $A \cap B'$
- D  $B' \cap A'$

32. A straight line has a gradient  $-3$  and passes through the point  $(3, -6)$ .

The  $x$ -intercept of the straight line is.

*Satu garis lurus mempunyai kecerunan  $-3$  dan melalui titik  $(3, -6)$ .*

*Pintasan- $x$  bagi garis lurus itu ialah*

- A. 3
- B. 1
- C.  $-1$
- D.  $-3$

33. The coordinates of point  $P$  are  $(-3, 4)$  and the gradient of the straight line  $PQ$  is  $-1$ .

The coordinates of point  $Q$  could be

*Koordinat bagi titik  $P$  ialah  $(-3, 4)$  dan kecerunan garis lurus  $PQ$  ialah  $-1$ .*

*Koordinat bagi titik  $Q$  yang mungkin ialah*

- A.  $(-3, -2)$
- B.  $(3, 2)$
- C.  $(-1, 2)$
- D.  $(1, 2)$

34. A box contains 24 oranges and a number of apples. A fruit is chosen at random from the box. The probability of choosing an apple is  $\frac{4}{7}$ . Find the number of apples in the box.

*Sebuah kotak mengandungi 24 biji oren dan beberapa biji epal. Sebiji buah dipilih secara rawak daripada kotak itu. Kebarangkalian memilih sebiji epal ialah  $\frac{4}{7}$ . Cari bilangan epal di dalam kotak itu.*

- A. 28
- B. 30
- C. 32
- D. 36



35. Table 3 shows how a group of 400 students travel to school.

*Jadual 3 menunjukkan bagaimana sekumpulan 400 orang murid ke sekolah.*

| Types of transport.<br><i>Jenis pengangkutan.</i> | Bicycle<br><i>Basikal</i> | Motorcycle<br><i>Motosikal</i> | Car<br><i>Kereta</i> | Bus<br><i>Bas</i> |
|---------------------------------------------------|---------------------------|--------------------------------|----------------------|-------------------|
| Number of students<br><i>Bilangan murid</i>       | 100                       | 70                             | 80                   | 150               |

Table 3 / Jadual 3

A student is chosen at random from the group. Find the probability that the students to school by car.

*Seorang murid dipilih secara rawak daripada kumpulan itu. Cari kebarangkalian bahawa murid itu pergi ke sekolah dengan kereta.*

A.  $\frac{1}{400}$

B.  $\frac{1}{80}$

C.  $\frac{1}{5}$

D.  $\frac{1}{4}$

36. The relationship between the variables  $x$ ,  $y$  and  $z$  is  $x \propto \frac{y}{z}$ . It is given that  $x = 10$  when  $y = 4$  and  $z = 8$ . Calculate the value of  $z$  when  $x = \frac{2}{5}$  and  $y = 2$ .

*Hubungan antara pembolehubah  $x$ ,  $y$  dan  $z$  ialah  $x \propto \frac{y}{z}$ . Diberi bahawa*

*$x = 10$  apabila  $y = 4$  dan  $z = 8$ . Hitung nilai  $z$  apabila  $x = \frac{2}{5}$  dan  $y = 2$ .*

A. 50

B. 60

C. 80

D. 100

37. Given  $Y \propto Z$  and  $Z = 3N + 4$ .

If  $Y = 5$  when  $N = 2$ , express  $Y$  in terms of  $Z$ .

*Diberi  $Y \propto Z$  dan  $Z = 3N + 4$ .*

*Jika  $Y = 5$  apabila  $N = 2$ , ungkapkan  $Y$  dalam sebutan  $Z$ .*

A.  $Y = \frac{Z}{2}$

B.  $Y = \frac{2}{Z}$

C.  $Y = 2Z$

D.  $Y = Z$

38. Table 4 shows the relation between three variables,  $p$ ,  $q$  and  $r$ .

*Jadual 4 menunjukkan hubungan antara tiga pemboleh ubah,  $p$ ,  $q$  dan  $r$ .*

|     |    |     |
|-----|----|-----|
| $p$ | 4  | 9   |
| $q$ | 2  | 3   |
| $r$ | 16 | $m$ |

Table 4 / *Jadual 4*

Given  $p \propto \frac{q^3}{r^2}$ , calculate the value of  $m$ .

*Diberi  $p \propto \frac{q^3}{r^2}$ , cari nilai  $m$ .*

A. 26

B. 36

C. 46

D. 56

39.  $\begin{pmatrix} 7 & 1 \\ 6 & 4 \end{pmatrix} + \begin{pmatrix} 4 & 7 \\ 8 & 6 \end{pmatrix} - \begin{pmatrix} 5 & 3 \\ 2 & 9 \end{pmatrix} + \begin{pmatrix} 2 & 4 \\ 7 & 9 \end{pmatrix} =$

A  $\begin{pmatrix} 8 & 1 \\ 19 & 10 \end{pmatrix}$

B  $\begin{pmatrix} 8 & 9 \\ 19 & 10 \end{pmatrix}$

C  $\begin{pmatrix} 14 & 9 \\ 19 & 10 \end{pmatrix}$

D  $\begin{pmatrix} 14 & 1 \\ 7 & 10 \end{pmatrix}$

40. The total price of 1 litre cooking oil brand X and 1 litre cooking oil brand Y is RM 19.50. The difference of price between 3 litre cooking oil brand X and 1 litre cooking oil brand Y is RM 12.50. Which of the following is correct method to calculate the price of 1 litre cooking oil brand X, RM x and 1 litre cooking oil brand Y, RM y?.

*Jumlah harga bagi 1 liter minyak masak jenama X dan 1 liter minyak masak jenama Y ialah RM 19.50. Beza harga antara 3 liter minyak masak jenama X dan 1 liter minyak masak jenama Y ialah RM 12.50. Antara berikut, manakah kaedah yang betul untuk mengira harga 1 liter minyak masak jenama X, RM x, dan 1 liter minyak masak jenama Y, RM y?*

A  $\begin{pmatrix} 1 & 3 \\ 1 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 19.50 \\ 12.50 \end{pmatrix}$

B  $\begin{pmatrix} 1 & 3 \\ 1 & -1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 19.50 \\ 12.50 \end{pmatrix}$

C  $\begin{pmatrix} 1 & 1 \\ 3 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 19.50 \\ 12.50 \end{pmatrix}$

D  $\begin{pmatrix} 1 & 1 \\ 3 & -1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 19.50 \\ 12.50 \end{pmatrix}$

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

*Skema*

**KELANTAN**

***KERTAS***

**1**

## SKEMA PERCUBAAN 1449/1 2020

|     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|
| 1.  | D | 11. | C | 21. | B | 31. | B |
| 2.  | B | 12. | D | 22. | B | 32. | B |
| 3.  | C | 13. | A | 23. | D | 33. | C |
| 4.  | D | 14. | B | 24. | D | 34. | C |
| 5.  | D | 15. | C | 25. | C | 35. | C |
| 6.  | C | 16. | B | 26. | A | 36. | D |
| 7.  | A | 17. | D | 27. | A | 37. | A |
| 8.  | A | 18. | D | 28. | D | 38. | B |
| 9.  | A | 19. | D | 29. | A | 39. | B |
| 10. | A | 20. | C | 30. | D | 40. | D |

## MATHEMATICAL FORMULAE RUMUS MATEMATIK

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

*Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.*

### RELATIONS PERKAITAN

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 <math>a^m \times a^n = a^{m+n}</math></p> <p>2 <math>a^m \div a^n = a^{m-n}</math></p> <p>3 <math>(a^m)^n = a^{mn}</math></p> <p>4 <math>A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d &amp; -b \\ -c &amp; a \end{pmatrix}</math></p> <p>5 Distance / Jarak<br/> <math display="block">= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}</math></p> <p>6 Midpoint / Titik tengah<br/> <math display="block">(x, y) = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)</math></p> <p>7 Average speed = <math>\frac{\text{distance travelled}}{\text{time taken}}</math><br/> <i>Purata laju = <math>\frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}</math></i></p> <p>8 Mean = <math>\frac{\text{sum of data}}{\text{number of data}}</math><br/> <i>Min = <math>\frac{\text{hasil tambah nilai data}}{\text{bilangan data}}</math></i></p> <p>9 Mean = <math>\frac{\text{sum of (classmark} \times \text{frequency)}}{\text{sum of frequencies}}</math><br/> <i>Min = <math>\frac{\text{hasil tambah (nilai titik tengah kelas} \times \text{kekerapan)}}{\text{hasil tambah kekerapan}}</math></i></p> | <p>10 Pythagoras Theorem<br/> <i>Teorem Pithagoras</i><br/> <math>c^2 = a^2 + b^2</math></p> <p>11 <math>P(A) = \frac{n(A)}{n(S)}</math></p> <p>12 <math>P(A') = 1 - P(A)</math></p> <p>13 <math>m = \frac{y_2 - y_1}{x_2 - x_1}</math></p> <p>14 <math>m = -\frac{y\text{-intercept}}{x\text{-intercept}}</math><br/> <math>m = -\frac{\text{pintasan } y}{\text{pintasan } x}</math></p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**SHAPES AND SPACE  
BENTUK DAN RUANG**

- 1 Area of trapezium =  $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$   
*Luas trapezium =  $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$*
- 2 Circumference of circle =  $\pi d = 2\pi r$   
*Lilitan bulatan =  $\pi d = 2\pi j$*
- 3 Area of circle =  $\pi r^2$   
*Luas bulatan =  $\pi j^2$*
- 4 Curved surface area of cylinder =  $2\pi rh$   
*Luas permukaan melengkung silinder =  $2\pi jt$*
- 5 Surface area of sphere =  $4\pi r^2$   
*Luas permukaan sfera =  $4\pi j^2$*
- 6 Volume of right prism = cross sectional area  $\times$  length  
*Isipadu prisma tegak = luas keratan rentas  $\times$  panjang*
- 7 Volume of cylinder =  $\pi r^2 h$   
*Isipadu silinder =  $\pi j^2 t$*
- 8 Volume of cone =  $\frac{1}{3} \pi r^2 h$   
*Isipadu kon =  $\frac{1}{3} \pi j^2 t$*
- 9 Volume of sphere =  $\frac{4}{3} \pi r^3$   
*Isipadu sfera =  $\frac{4}{3} \pi j^3$*
- 10 Volume of right pyramid =  $\frac{1}{3} \times \text{base area} \times \text{height}$   
*Isipadu piramid tegak =  $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$*
- 11 Sum of interior angles of a polygon  
*Hasil tambah sudut pedalaman poligon*  
 $= (n - 2) \times 180^\circ$

$$12. \frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$13. \frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$14. \text{Scale factor, } k = \frac{PA'}{PA}$$

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

$$15. \text{Area of image} = k^2 \times \text{area of object}$$

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



**TERENGGANU**

***KERTAS***

**2**

**Section A**  
**Bahagian A**  
[52 marks]  
[52 markah]

Answer **all** questions in this section.

Jawab **semua** soalan dalam bahagian ini.

- 1** (a) Diagram 1 is a Venn diagram showing set  $J$  and set  $K$  such that the universal set,  $\xi = J \cup K$ .

Rajah 1 ialah gambar rajah Venn yang menunjukkan set  $J$  dan set  $K$ , dengan keadaan set semesta,  $\xi = J \cup K$ .

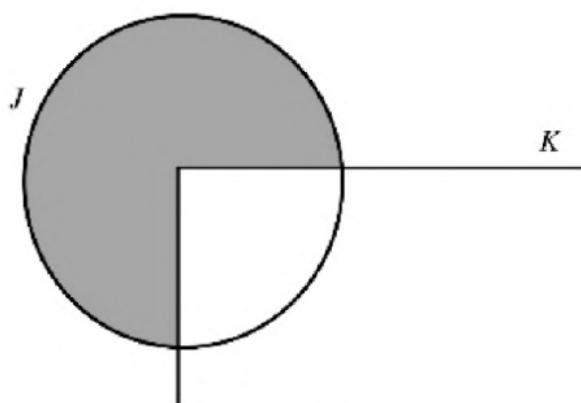


Diagram 1

Rajah 1

State the relation between set  $J$  and set  $K$ .

[1 mark]

Nyatakan hubungan antara set  $J$  dan set  $K$ .

[1 markah]

- (b) It is given that the universal set,  $\xi = \{\text{perfect squares} < 100\}$ , set  $Q = \{25, 36, 49\}$ , set  $R = \{\text{multiples of } 5\}$  and set  $S = \{\text{numbers divisible by } 4\}$ .

Based on the information in (b), draw a Venn diagram in the answer space, to show the relationship between set  $Q$ , set  $R$  and set  $S$ .

Diberi bahawa set semesta,  $\xi = \{\text{kuasa dua sempurna} < 100\}$ , set  $Q = \{25, 36, 49\}$ , set  $R = \{\text{gandaan } 5\}$ , dan set  $S = \{\text{nombor yang boleh dibahagi dengan } 4\}$ .

Berdasarkan maklumat di (b), lukis gambar rajah Venn pada ruang jawapan, untuk menunjukkan hubungan di antara set  $Q$ , set  $R$  dan set  $S$ .

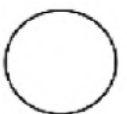
[2 marks]

[2 markah]

*Answer / Jawapan:*

(a)

(b)



- 2 Diagram 2 in the answer space shows a picture of solar panels on top of a flat roof of a building. The edge  $QR$ , of the solar panel is 2.6 m and the angle between the solar panel and the roof is  $41^\circ 42'$ .

*Rajah 2 pada ruang jawapan menunjukkan gambar panel solar di atas bumbung yang rata sebuah bangunan. Tepi  $QR$ , bagi panel solar ialah 2.6 m dan sudut antara panel solar dengan bumbung ialah  $41^\circ 42'$ .*

- (a) On Diagram 2 in the answer space, mark the angle between the solar panel and the roof. [1 mark]

*Pada Rajah 2 di ruang jawapan, tandakan sudut di antara panel solar dengan bumbung. [1 markah]*

- (b) Hence, calculate the height of the solar panel from the roof,  $QS$ . [2 marks]  
*Seterusnya, hitung tinggi panel solar daripada bumbung,  $QS$ . [2 markah]*

Answer / Jawapan:

(a)

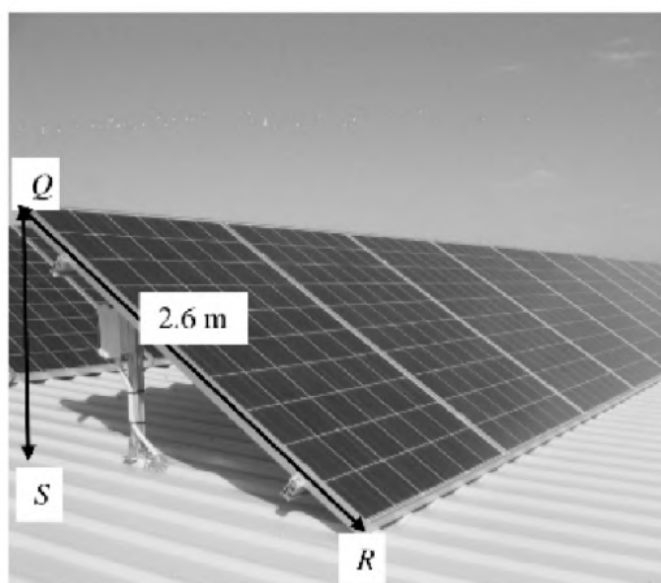
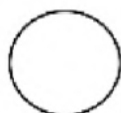


Diagram 2

Rajah 2

(b)



- 3 Diagram 3 shows two rectangles  $BCDE$  and  $EFGH$ .  $BHE$  and  $EFD$  are straight lines.

*Rajah 3 menunjukkan dua segi empat tepat  $BCDE$  dan  $EFGH$ .  $BHE$  dan  $EFD$  ialah garis lurus.*

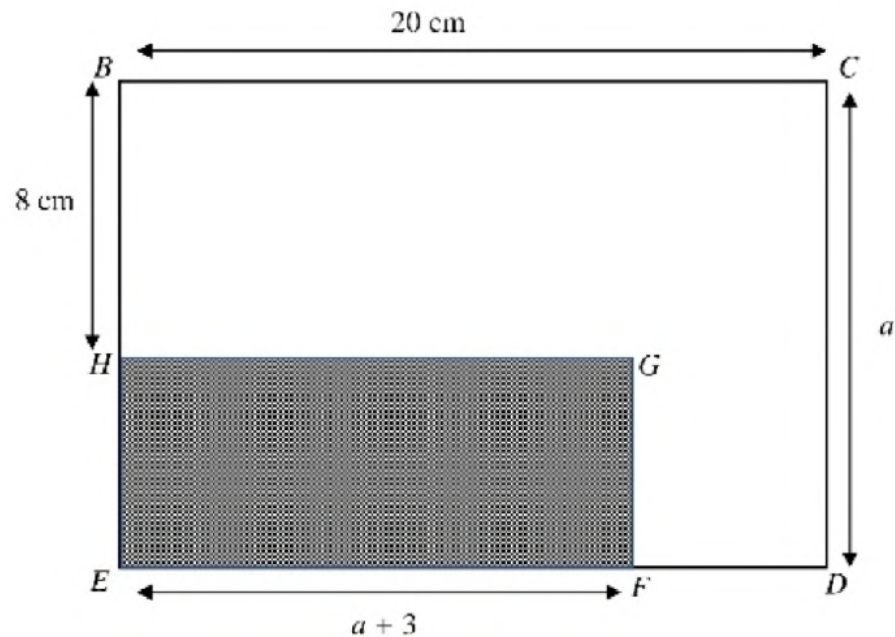


Diagram 3  
Rajah 3

Given the area of the shaded rectangle is  $60 \text{ cm}^2$ . Calculate the perimeter of rectangle  $BCDE$ .

*Diberi luas segi empat yang berlorek ialah  $60 \text{ cm}^2$ . Hitung perimeter bagi segi empat  $BCDE$ .*

[4 marks]

[4 markah]

Answer / Jawapan:

- 4 Eisraq has a solid metal sphere and he wants to melt it to form 3 cone-shaped solids. Diagram 4 (i) and diagram 4(ii) show the sphere and the 3 cones respectively. Each cone has a radius of 2 cm and the vertical height of 9 cm.

Using  $\pi = \frac{22}{7}$ , calculate the radius of the metal sphere.

*Eisraq mempunyai sebuah pepejal logam berbentuk sfera dan dia mahu meleburkannya untuk membentuk 3 pepejal berbentuk kon. Rajah 4(i) dan rajah 4(ii) masing-masing menunjukkan sfera dan 3 kon tersebut. Setiap kon mempunyai jejari 2 cm dan tinggi tegak 9 cm.*

*Dengan menggunakan  $\pi = \frac{22}{7}$ , hitung jejari sfera logam itu.*



Diagram 4(i)  
Rajah 4(i)

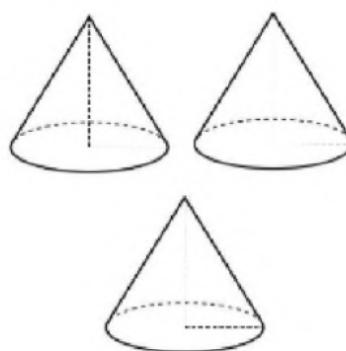
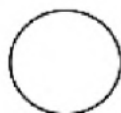


Diagram 4(ii)  
Rajah 4(ii)

[4 marks]  
[4 markah]

Answer / Jawapan :



- 5 **Solution by matrix method is not allowed to answer this question.**  
***Penyelesaian dengan kaedah matriks tidak dibenarkan untuk menjawab soalan ini.***

A sports shop advertises to sell a badminton racket and a squash racket at RM60 and RM85 respectively. The cost price of two badminton rackets and four squash rackets is RM200. While the cost price for four badminton rackets and two squash rackets is RM160.

Calculate the profit earned for each of the badminton racket and squash racket sold.

*Sebuah kedai sukan mengiklan untuk menjual sebatang raket badminton dan sebatang raket skuasy pada harga masing-masing RM60 dan RM85. Harga kos bagi dua batang raket badminton dan empat batang raket skuasy ialah RM200. Manakala harga kos bagi empat batang raket badminton dan dua batang raket skuasy ialah RM160.*

*Hitung keuntungan yang diperolehi untuk setiap raket badminton dan skuasy yang dijual.*

[6 marks ]

[6 markah]

Answer/Jawapan:

- 6 (a) State whether the following statement is true or false.

*Nyatakan sama ada pernyataan berikut adalah benar atau palsu.*

$$4^2 = 8 \text{ or } \sqrt[3]{-8} = -2$$

$$4^2 = 8 \text{ atau } \sqrt[3]{-8} = -2$$

[1 mark]

[1 markah]

- (b) Write down Premise 2 to complete the following argument.

*Tulis Premis 2 untuk melengkapkan hujah berikut.*

Premise 1 : If  $p = 7$ , then  $6 \times p = 42$

*Premis 1 : Jika  $p = 7$ , maka  $6 \times p = 42$*

Premise 2 : .....

*Premis 2 : .....*

Conclusion :  $p \neq 7$

*Kesimpulan :  $p \neq 7$*

[1 mark]

[1 markah]

- (c) Make a general conclusion by induction for the sequence of numbers 3, 8, 15, 24, ... which follows the following pattern.

*Buat satu kesimpulan umum secara aruhan untuk turutan nombor 3, 8, 15, 24,... yang mengikut pola yang berikut.*

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

$$8 = 4 + 2(2)$$

$$15 = 9 + 2(3)$$

$$24 = 16 + 2(4)$$

$$\cdot$$

$$\cdot$$

$$\cdot$$

[2 marks]

[2markah]



Answer / Jawapan

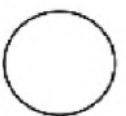
(a) .....

(b) Premise/Premis 2 : .....

(c) .....

.....

,



- 7 Diagram 5 shows two parallel straight lines,  $APB$  and  $CD$  drawn on a Cartesian plane.  
The straight line  $PQ$  is parallel to the  $y$ -axis.

*Rajah 5 menunjukkan dua garis lurus selari,  $APB$  dan  $CD$  dilukis pada suatu satah Cartes.*

*Garis lurus  $PQ$  adalah selari dengan paksi- $y$ .*

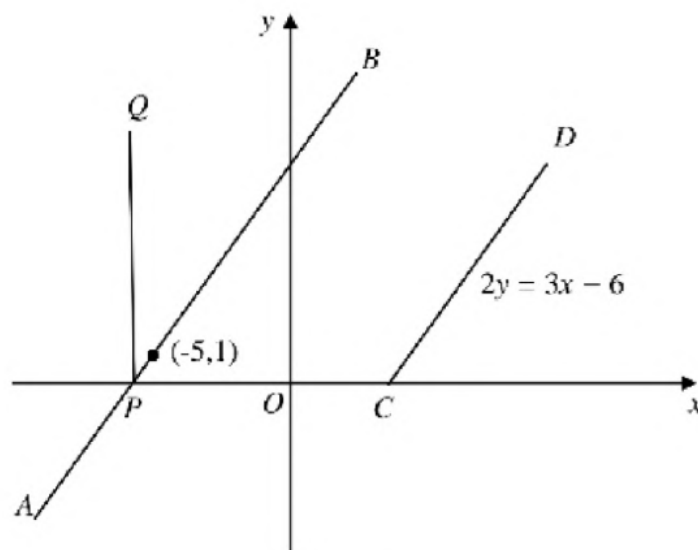


Diagram 5  
*Rajah 5*

Find

*Cari*

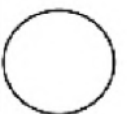
- (a) the equation of the straight line  $APB$  ,  
*persamaan garis lurus  $APB$ ,*
- (b) the  $x$ -intercept of the straight line  $PQ$ .  
*pintasan- $x$  bagi garis lurus  $PQ$ .*

[5 marks ]  
[ 5 markah]

*Answer / Jawapan :*

*(a)*

*(b)*



- 8 Diagram 6 shows a short sleeve blouse and a long sleeve blouse that need to be sewn by Mrs. Dirah.

*Rajah 6 menunjukkan blaus lengan pendek dan lengan panjang yang perlu dijahit oleh Pn Dirah.*

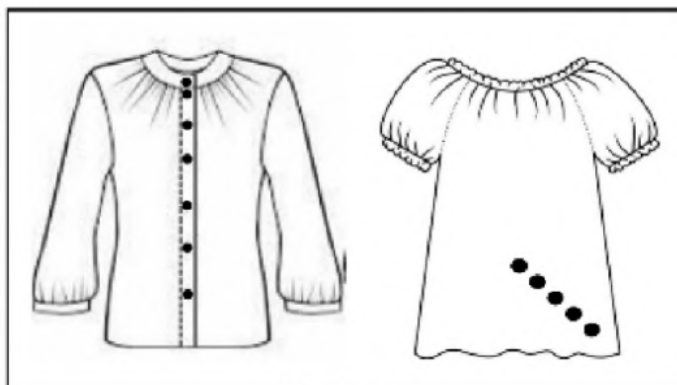


Diagram 6

*Rajah 6*

Mrs. Dirah received order of 60 pieces of short sleeve and long sleeve blouses. Short sleeve blouse requires 5 buttons meanwhile long sleeve blouse requires 7 buttons. She used 364 buttons to complete all the blouses.

By using the matrix method, calculate the number of short sleeve and a long sleeve blouses that Mrs. Dirah should complete.

*Pn Dirah telah mendapat tempahan 60 helai blaus lengan pendek dan lengan panjang. Blaus lengan pendek memerlukan 5 biji butang dan blaus lengan panjang memerlukan 7 biji butang. Dia menggunakan 364 biji butang untuk menyiapkan semua blaus itu.*

*Dengan menggunakan kaedah matrik, hitung bilangan blaus lengan pendek dan lengan panjang yang perlu disiapkan oleh Pn Dirah.*

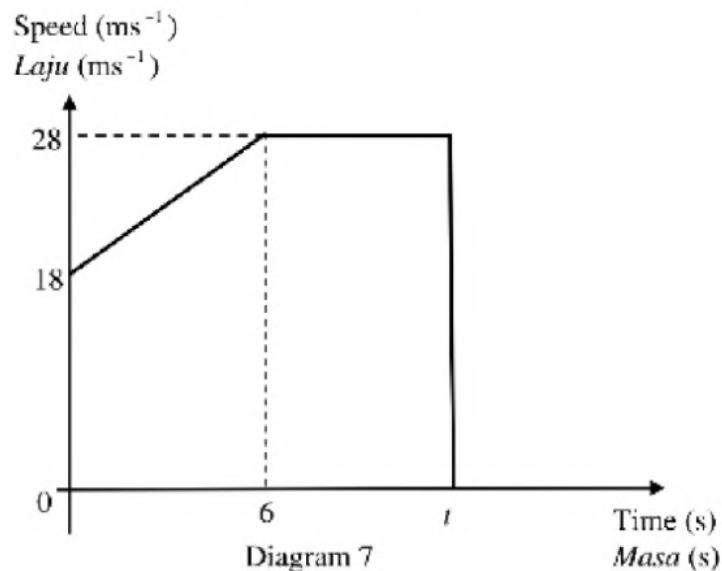
[5 marks]

[5 markah]

Answer / Jawapan:

- 9 Diagram 7 shows the speed-time graph for the movement of a particle for a period of  $t$  seconds.

Rajah 7 menunjukkan graf laju-masa bagi pergerakan suatu zarah dalam  $t$  saat.



- (a) State the uniform speed, in  $\text{ms}^{-1}$ , of the particle.  
*Nyatakan laju seragam, dalam  $\text{ms}^{-1}$ , zarah itu.*
- (b) Calculate the rate of change of speed, in  $\text{ms}^{-2}$ , of the particle in the first 6 seconds.  
*Hitung kadar perubahan laju, dalam  $\text{ms}^{-2}$ , zarah itu dalam 6 saat yang pertama.*
- (c) The total distance travelled in  $t$  seconds is 278 m. Calculate the value of  $t$ .  
*Jumlah jarak yang dilalui dalam  $t$  saat ialah 278 m. Hitung nilai  $t$ .*

[6 marks]

[6 markah]

Answer / Jawapan:

(a)

(b)

(c)



- 10 (a) A box contains four marbles coloured in Red, Blue, Green and Yellow. Two marbles are picked one by one at random from the container without replacement, and the colours are recorded.

*Sebuah kotak mengandungi empat guli berwarna Merah, Biru, Hijau dan Kuning. Dua biji guli diambil secara rawak satu persatu, dari bekas itu tanpa pengembalian dan warnanya dicatat.*

- (i) Based on the above information, list all the possible outcomes.  
*Berdasarkan maklumat di atas, senaraikan semua kesudahan yang mungkin.*
- (ii) By listing all the possible outcomes of the event, find the probability that the pair contains a red marble.  
*Dengan menyenaraikan semua kesudahan yang mungkin, cari kebarangkalian bahawa pasangan itu mempunyai guli merah.*

[3 marks]

[3 markah]

- (b) A group of students namely Ali, Badri, Chong and Dhillip are members of Mathematics Club. Two of them will be chosen at random for the competition.

*Sekumpulan pelajar lelaki iaitu Ali, Badri, Chong dan Dhillip adalah ahli Kelab Matematik. Dua orang di antara mereka akan dipilih secara rawak ke pertandingan tersebut.*

- (i) Based on the above information, list all the possible pairing.  
*Berdasarkan maklumat di atas, senaraikan semua pasangan yang mungkin.*
- (ii) By listing all the possible outcomes of the event, find the probability that Ali is not chosen.  
*Dengan menyenaraikan semua kesudahan yang mungkin, cari kebarangkalian bahawa Ali tidak terpilih.*

[3 marks]

[3 markah]

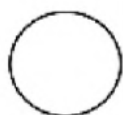
Answer / Jawapan:

(a) (i)

(ii)

(b) (i)

(ii)





- 11** In Diagram 9,  $OKLM$  is a sector of a circle with centre  $O$ .  $KPQ$  is a quadrant of a circle with centre  $Q$  and  $OSM$  is a semicircle.

Dalam Rajah 9,  $OKLM$  ialah sektor bulatan dengan pusat  $O$ .  $KPQ$  ialah sukuan bulatan dengan pusat  $Q$  dan  $OSM$  ialah semibulatan.

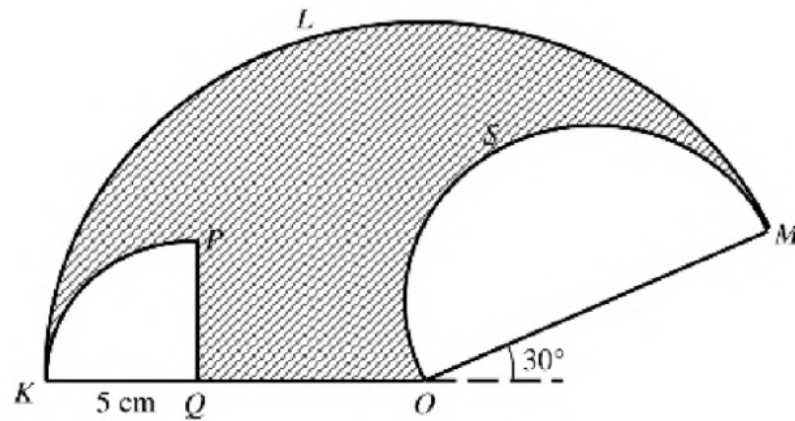


Diagram 9  
Rajah 9

Given that  $MO = 14$  cm.

Use  $\pi = \frac{22}{7}$ , calculate

Diberi bahawa  $MO = 14$  cm.

Guna  $\pi = \frac{22}{7}$ , hitung

- (a) the perimeter, in cm, of the shaded region,  
perimeter, dalam cm, bagi rantau berlorek,
- (b) the area, in  $\text{cm}^2$ , of the shaded region.  
luas, dalam  $\text{cm}^2$ , bagi rantau berlorek.

[6 marks]

[ 6 markah]

**Section B**  
**Bahagian B**  
[48 marks ]  
[48 markah ]

Answer any **four** questions from this section.  
Jawab **empat** soalan daripada bahagian ini.

- 12** (a) Complete Table 1 in the answer space for the equation  $y = x^3 - 5x - 12$  by writing down the values of  $y$  when  $x = -3$  and  $x = 2$ .

*Lengkapkan Jadual 1 di ruang jawapan bagi persamaan  $y = x^3 - 5x - 12$  dengan menulis nilai-nilai  $y$  apabila  $x = -3$  dan  $x = 2$ .*

[2 marks]

[2 markah]

- (b) For this part of the question, use the graph paper provided on page 24. You may use a flexible curve ruler.

*Untuk ceraiian soalan ini, gunakan kertas graf yang disediakan pada halaman 24. Anda boleh menggunakan pembaris fleksibel.*

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  $y = x^3 - 5x - 12$  for  $-3 \leq x \leq 3.6$ .

*Menggunakan skala 2 cm kepada 1 unit pada paksi- $x$  dan 2 cm kepada 5 unit pada paksi- $y$ , lukis graf  $y = x^3 - 5x - 12$  bagi  $-3 \leq x \leq 3.6$ .*

[4 marks]

[4 markah]

- (c) From your graph, find  
*Daripada graf anda, cari*

- (i) the value of  $x$  when  $y = 10$ ,  
*nilai  $x$  apabila  $y = 10$ ,*
- (ii) the value of  $y$  when  $x = -2.5$   
*nilai  $y$  apabila  $x = -2.5$*

[2 marks]

[2 markah]

- (d) Draw a suitable straight line on your graph to find the values of  $x$  which satisfy the equation  $x^3 - 13x + 4 = 0$  for  $-3 \leq x \leq 3.6$ . State these values of  $x$ .

*Lukis satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai  $x$  yang memuaskan persamaan  $x^3 - 13x + 4 = 0$  untuk  $-3 \leq x \leq 3.6$ . Nyatakan nilai-nilai  $x$  itu.*

[4 marks]

[4 markah]

Answer / Jawapan :

(a)  $y = x^3 - 5x - 12$

|   |    |     |    |     |     |   |   |      |
|---|----|-----|----|-----|-----|---|---|------|
| x | -3 | -2  | -1 | 0   | 1   | 2 | 3 | 3.6  |
| y |    | -10 | -8 | -12 | -16 |   | 0 | 16.7 |

Table 1  
Jadual 1

(b) Refer graph on page 24

Rujuk graf halaman 24

(c) (i)  $x =$  .....

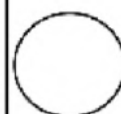
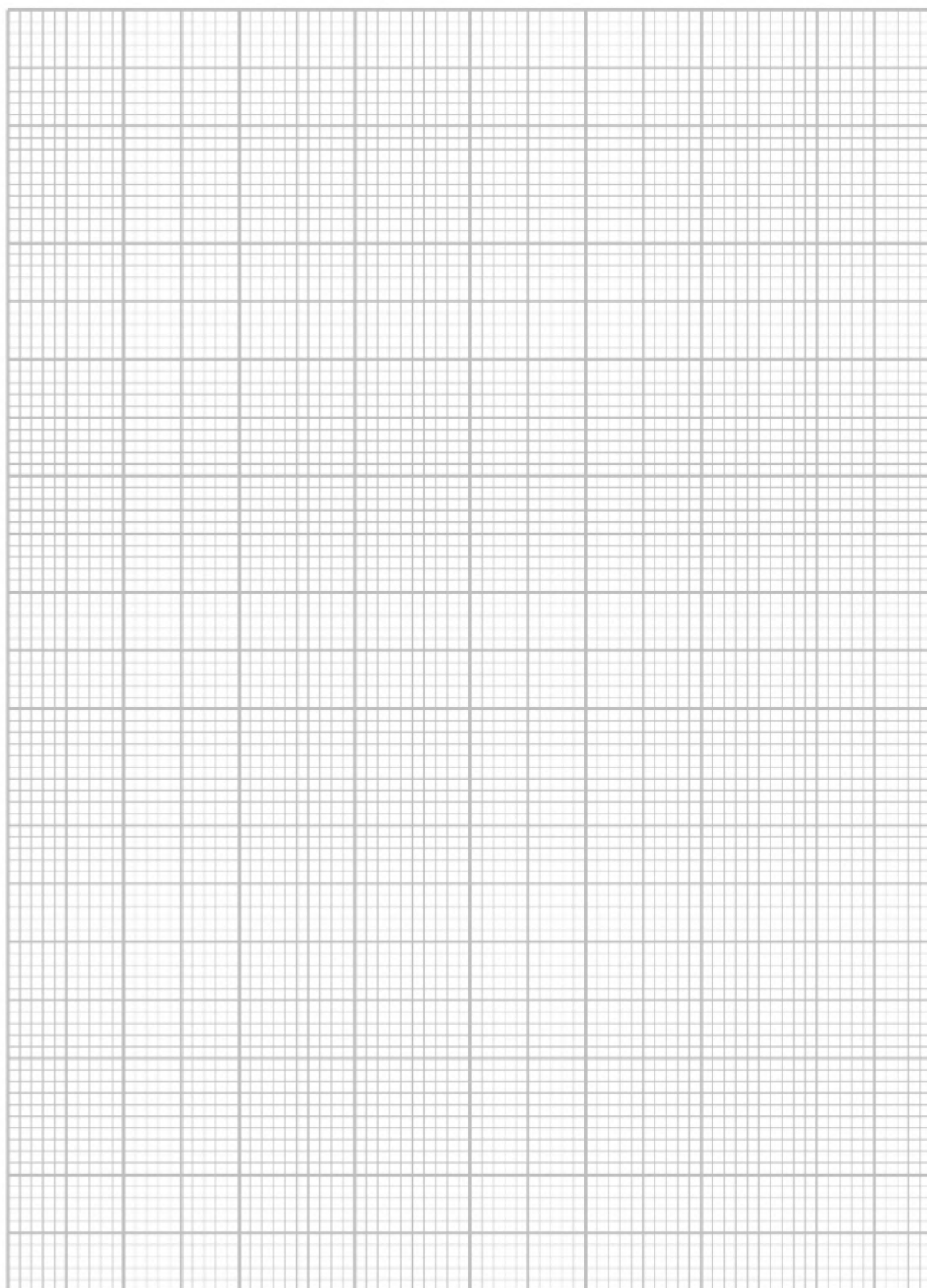
(ii)  $y =$  .....

(d) The equation of the straight line:

Persamaan garis lurus:

.....

$x =$  ..... , .....

**Graph for Question 12**  
**Graf untuk Soalan 12**

- 13 Diagram 10 shows three quadrilaterals  $JKLM$ ,  $PQRS$  and  $TUVW$  on a Cartesian plane.

Rajah 10 menunjukkan tiga buah sisiempat  $JKLM$ ,  $PQRS$  dan  $TUVW$  pada suatu satah Cartes.

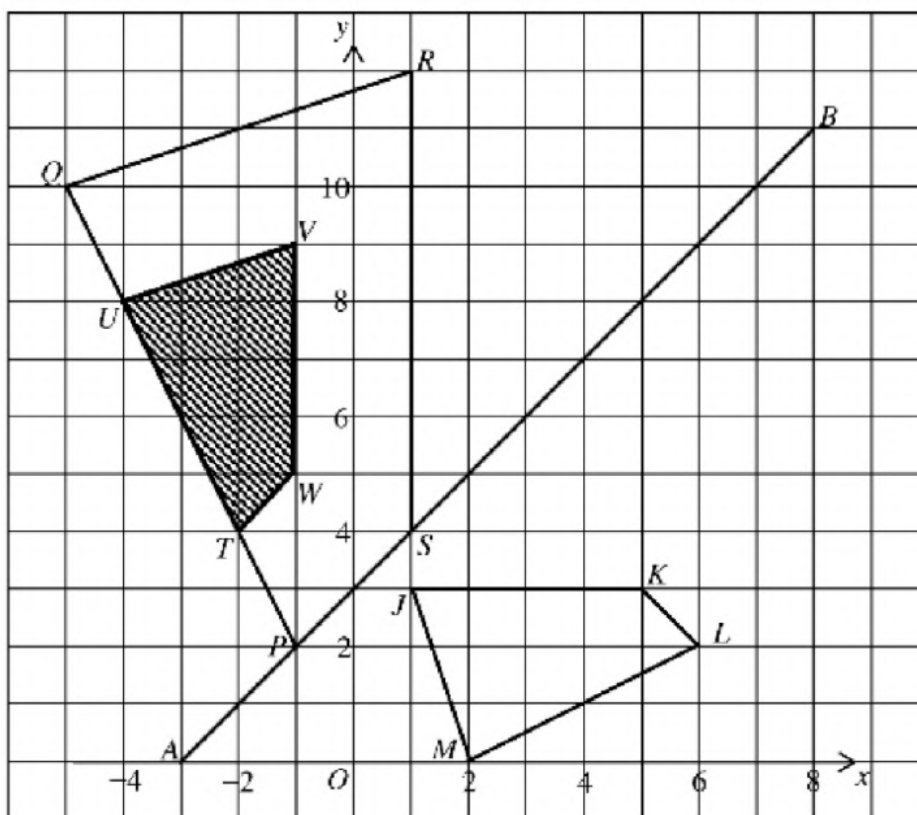


Diagram 10 / Rajah 10

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

Penjelmaan **T** ialah translasi  $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$

Transformation **V** is a reflection in the line  $AB$

Penjelmaan **V** ialah pantulan pada garis  $AB$

- (a) State the coordinates of the image of point  $K$  under each of the following transformations:

Nyatakan koordinat imej titik  $K$  di bawah setiap penjelmaan berikut:

- (i) **T**
- (ii) **TV**

[3 marks]

[3 markah]

- (b)  $PQRS$  is the image of  $JKLM$  under transformation  $GL$ .  
 *$PQRS$  ialah imej bagi  $JKLM$  di bawah penjelmaan  $GL$ .*

- (i) Describe in full the transformation  
*Huraikan selengkapnya penjelmaan*

(a) **L.**

(b) **G.**

- (ii) Given that the region  $TUVW$  represents a region of area  $100 \text{ m}^2$ . Calculate area, in  $\text{m}^2$ , region represents by unshaded region  $QRSPTWVU$ .

*Diberi bahawa rantau  $TUVW$  mewakili suatu kawasan yang mempunyai luas  $100 \text{ m}^2$ . Hitungkan luas, dalam  $\text{m}^2$ , kawasan yang diwakili oleh kawasan tidak berlorek  $QRSPTWVU$ .*

[9 marks]

[9 markah]

Answer / Jawapan :

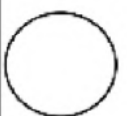
(a) (i)

(ii)

(b) (i) (a)

(b)

(ii)



- 14** Qistina Sahira has carried out an age-related study with the possibility of being infected with Coronavirus 2019 (COVID-19), to complete her PhD thesis. Diagram 11 shows the age of patients diagnosed with Coronavirus 2019 (COVID-19) positive, obtained from 50 patients in a Swab Test.

*Qistina Sahira telah menjalankan kajian perkaitan umur dengan kebarangkalian dijangkiti penyakit Coronavirus 2019 (COVID-19), bagi melengkapkan tesis PhD. Rajah 11 menunjukkan umur pesakit yang dikesan positif penyakit Coronavirus 2019 (COVID-19), diperoleh daripada 50 orang pesakit dalam suatu 'Swab Test'.*

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 74 | 58 | 85 | 65 | 68 | 59 | 45 | 56 | 40 | 30 |
| 39 | 69 | 42 | 74 | 61 | 68 | 84 | 58 | 92 | 41 |
| 48 | 55 | 71 | 54 | 77 | 82 | 79 | 89 | 45 | 86 |
| 67 | 68 | 95 | 81 | 35 | 77 | 78 | 67 | 91 | 33 |
| 58 | 52 | 62 | 65 | 59 | 65 | 91 | 78 | 32 | 40 |

Diagram 11/ Rajah 11

- (a) (i) Based on the data in Diagram 11, complete Table 14 in the answer space on page 29.

*Berdasarkan data di Rajah 11, lengkapkan Jadual 11 di ruang jawapan pada halaman 29.*

[3 marks ]  
[3 markah]

- (ii) State the size of the class interval.

*Nyatakan saiz bagi selang kelas.*

[1 mark ]  
[1 markah]

- (b) Based on Table 3, calculate the estimated mean the age of patients diagnosed with Coronavirus 2019 (COVID-19) positive.

*Berdasarkan Jadual 3, hitung min anggaran umur pesakit yang dikesan positif penyakit Coronavirus 2019 (COVID-19).*

[3 marks ]  
[3 markah]

- (c) For this part of the question, use the graph paper provided on page 29.

By using a scale of 2 cm to 10 years old on the horizontal axis and 2 cm to 1 patient on the vertical axis, draw a histogram for the data.

*Untuk ceraian soalan ini, gunakan kertas graf yang disediakan di halaman 29.*

*Dengan menggunakan skala 2 cm kepada 10 tahun pada paksi mengufuk dan 2 cm kepada seorang pesakit pada paksi mencancang, lukis satu histogram bagi data tersebut.*

[4 marks]  
[4 markah]

- (d) If the age of the senior citizen begins at 60 years old. Using the histogram drawn in 14(c), state the number of senior citizens diagnosed positive for Coronavirus 2019 (COVID-19).

*Jika umur warga emas bermula 60 tahun. Menggunakan histogram yang dilukis di 14(c), nyatakan bilangan warga emas yang dikesan positif penyakit Coronavirus 2019 (COVID-19).*

[1 mark]

[1 markah]

Answer / Jawapan :

(a) (i)

| Age<br><i>Umur</i> | Frequency<br><i>Kekerapan</i> | Midpoint<br><i>Titik tengah</i> |
|--------------------|-------------------------------|---------------------------------|
| 30 – 39            | 5                             | 34.5                            |
| 40 – 49            |                               |                                 |
|                    |                               |                                 |
|                    |                               |                                 |
|                    |                               |                                 |
|                    |                               |                                 |
| 90 – 99            | 4                             | 94.5                            |

Table 11

Jadual 11

- (ii) The size of the class interval is  
*Saiz bagi selang kelas ialah*

.....

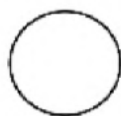
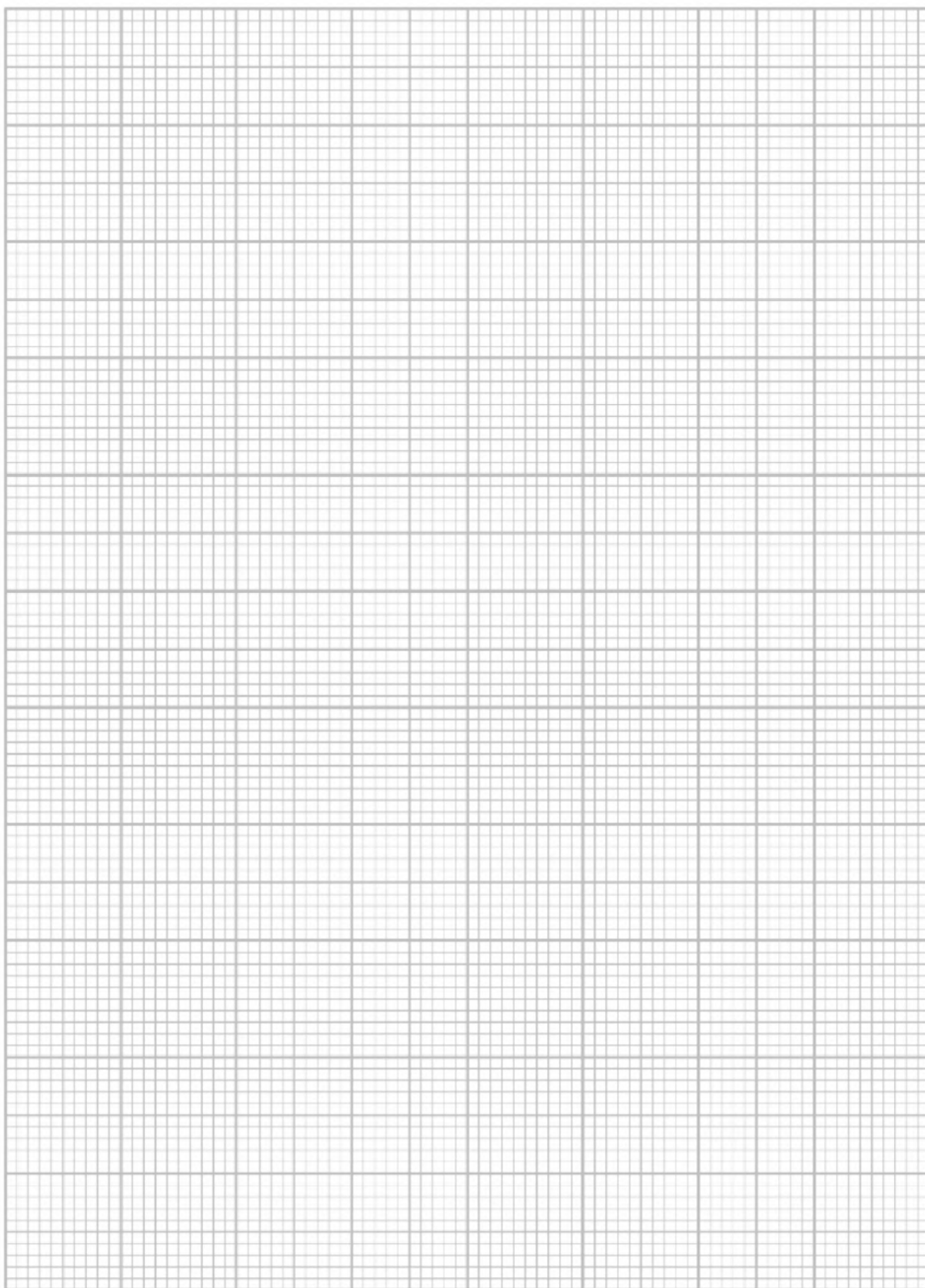
(b)

- (c) Refer graph on page 29.  
*Rujuk graf di halaman 29.*

(d)



Graph for Question 14  
*Graf untuk Soalan 14*



- 15** You are **not** allowed to use graph paper to answer this question.  
Anda **tidak** dibenarkan menggunakan kertas graf untuk menjawab soalan ini.

- (a) Diagram 12.1 shows a composite solid, formed by a combination of a solid cuboid and a solid right prism at the vertical plane  $BCGJ$ .  $DEF$  is the uniform cross section of the prism. The base  $ABMLC$  is a trapezium which lies on a horizontal plane. Edges  $EA$  and  $KM$  are vertical.

Rajah 12.1 menunjukkan satu gabungan pepejal yang terbentuk daripada cantuman sebuah pepejal yang berbentuk kuboid dan sebuah pepejal berbentuk prisma tegak pada satah tegak  $BCGJ$ .  $DEF$  ialah keratan rentas seragam prisma itu. Tapak  $ABMLC$  ialah sebuah trapezium yang terletak pada satah mengufuk. Tepi  $EA$  dan  $KM$  adalah tegak.

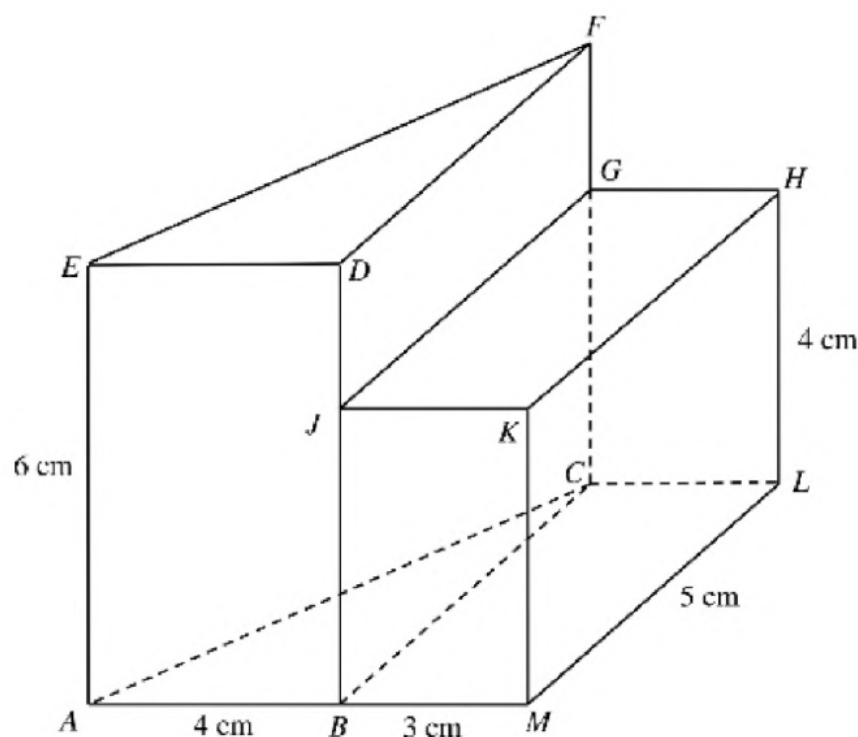


Diagram 12.1  
Rajah 12.1

Draw to full scale, the plan of the solid.  
Lukis dengan skala penuh, pelan pepejal itu.

[3 marks]

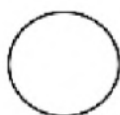
[3 markah]

*Answer / Jawapan:*

(a)



Answer / Jawapan:  
(b) (i), (ii)



- 16 In the Diagram 13.1,  $N$  is the North Pole,  $S$  is the South Pole, and  $O$  is the centre of the earth.  $P$  ( $60^\circ N$ ,  $40^\circ E$ ),  $Q$  ( $60^\circ N$ ,  $80^\circ W$ ),  $R$  and  $H$  are four points on the surface of the earth such that  $PH$  is the diameter of a parallel of latitude.

Dalam Rajah 13.1,  $N$  ialah Kutub Utara dan  $S$  ialah Kutub Selatan, dan  $O$  ialah pusat bumi.  $P$  ( $60^\circ U$ ,  $40^\circ T$ ),  $Q$  ( $60^\circ U$ ,  $80^\circ B$ ),  $R$  dan  $H$  ialah empat titik di permukaan bumi dengan keadaan  $PH$  ialah diameter selarian latitud.

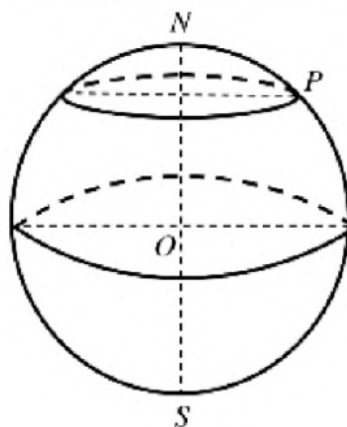


Diagram 13.1

Rajah 13.1

- (a)  $PR$  is the diameter of the earth. Mark and label point  $H$  and  $R$  on Diagram 13.2 in the answer space.

Diberi  $PR$  ialah diameter bumi. Tanda dan label titik  $H$  dan  $R$  pada Rajah 13.2 di ruang jawapan.

[2 marks]

[ 2 markah]

- (b) Calculate the shortest distance, in nautical miles, from  $P$  to  $H$  via North Pole.

Hitungkan jarak terpendek, dalam batu nautika, dari  $P$  ke  $H$  melalui Kutub Utara.

[2 marks]

[ 2 markah]

- (c)  $V$  lies south of  $P$  and the distance of  $PV$  measured along the surface of the earth is 4500 nautical miles. Calculate the latitude of  $V$ .

$V$  terletak ke selatan  $P$  dan jarak  $PV$  diukur sepanjang permukaan bumi ialah 4500 batu nautika.

Hitung latitud bagi  $V$ .

[3 marks]

[ 3 markah]

- (d) An aeroplane took off from  $Q$  and flew due east to  $P$  and then flew due south to  $V$ . The average speed for the whole flight was 580 knots.

*Sebuah kapal terbang berlepas dari  $Q$  arah ke timur ke  $P$  dan kemudian terbang arah selatan ke  $V$ . Purata laju seluruh penerbangan kapal terbang itu ialah 580 knot.*

Calculate / Hitung

- (i) the distance, in nautical mile, taken by the aeroplane from  $Q$  to  $P$  measured along the common parallel of latitude,

*jarak, dalam batu nautika, yang dilalui oleh kapal terbang itu dari  $Q$  ke  $P$  diukur sepanjang selarian latitud sepunya.*

- (ii) the total time, in hours, taken for the whole flight.

*jumlah masa, dalam jam, yang diambil bagi seluruh penerbangan itu.*

[5 marks]

[ 5 markah]

Answer/Jawapan:

(a)

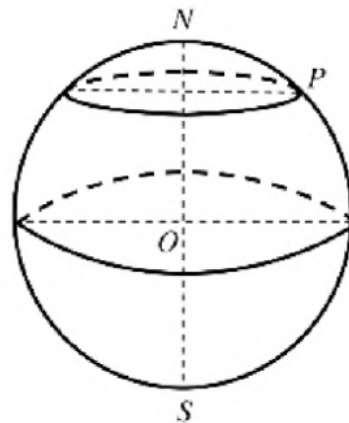


Diagram 13.2  
Rajah 13.2

(b)

(c)

(d) (i)

(ii)

KERTAS SOALAN TAMAT



*Skema*

**TERENGGANU**

***KERTAS***

**2**



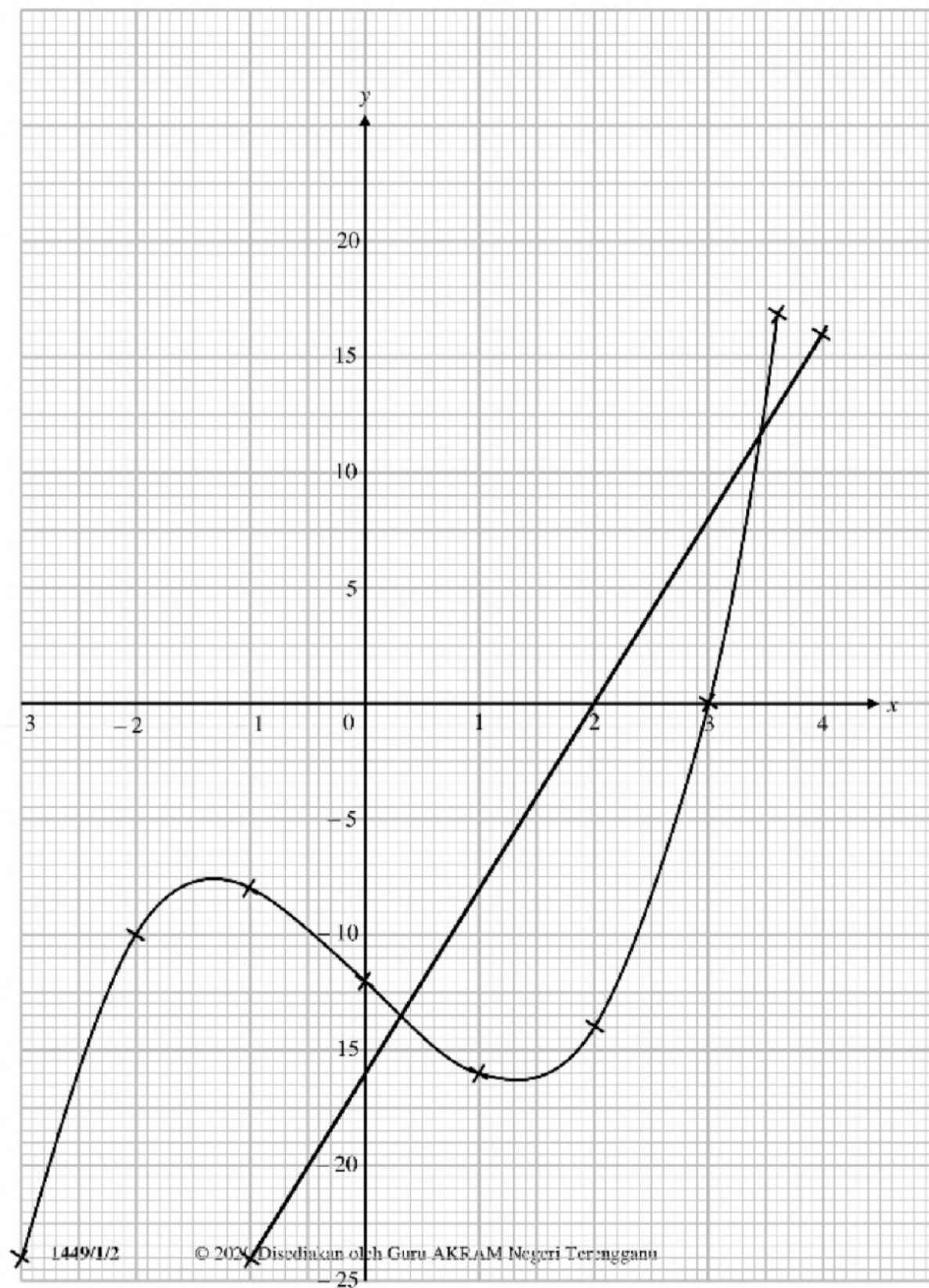
| Soalan      | Peraturan Permarkahan                                                                                                                 | Markah    |          |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| <b>4</b>    | $\left(\frac{4}{3} \times \frac{22}{7} \times r^3\right)$                                                                             | <b>K1</b> |          |
|             | $3 \times \left(\frac{1}{3} \times \frac{22}{7} \times 2^2 \times 9\right)$                                                           | <b>K1</b> |          |
|             | $\left(\frac{4}{3} \times \frac{22}{7} \times r^3\right) = 3 \times \left(\frac{1}{3} \times \frac{22}{7} \times 2^2 \times 9\right)$ | <b>K1</b> |          |
|             | 3                                                                                                                                     | <b>N1</b> | <u>4</u> |
| <b>5</b>    | $2x + 4y = 200$                                                                                                                       | <b>P1</b> |          |
|             | $4x + 2y = 160$                                                                                                                       | <b>P1</b> |          |
|             | $x = 100 - 2y$ or $y = 80 - 2x$ or equivalent                                                                                         | <b>K1</b> |          |
|             | $x = 20$ or $y = 40$                                                                                                                  | <b>K1</b> |          |
|             | Badminton racket = 40                                                                                                                 | <b>N1</b> |          |
|             | Squash racket = 45                                                                                                                    | <b>N1</b> | <u>6</u> |
| <b>6(a)</b> | True/ <i>Benar</i>                                                                                                                    | <b>P1</b> |          |
|             | (b) $6 \times p \neq 42$                                                                                                              | <b>P1</b> |          |
|             | (c) $n^2 + 2n$                                                                                                                        | <b>K1</b> |          |
|             | $n = 1, 2, 3, 4, \dots$                                                                                                               | <b>N1</b> | <u>4</u> |
| <b>7(a)</b> | $m = \frac{3}{2}$                                                                                                                     | <b>P1</b> |          |
|             | $1 = \frac{3}{2}(-5) + c$ or $c = \frac{17}{2}$ or equivalent                                                                         | <b>K1</b> |          |
|             | $y = \frac{3}{2}x + \frac{17}{2}$ or equivalent                                                                                       | <b>N1</b> |          |
|             | (b) $0 = \frac{3}{2}x + \frac{17}{2}$                                                                                                 | <b>K1</b> |          |
|             | $x\text{-intercept} = -\frac{17}{3}$                                                                                                  | <b>N1</b> | <u>5</u> |

| Soalan       | Peraturan Permarkahan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Markah    |                |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------|
| <b>8</b>     | $x + y = 60$ or $5x + 7y = 364$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>P1</b> | <hr/> <b>5</b> |
|              | $\begin{pmatrix} 1 & 1 \\ 5 & 7 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 60 \\ 364 \end{pmatrix}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>P1</b> |                |
|              | $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{(1)(7) - (1)(5)} \begin{pmatrix} 7 & -1 \\ -5 & 1 \end{pmatrix} \begin{pmatrix} 60 \\ 364 \end{pmatrix}$ or equivalent                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>K1</b> |                |
|              | $x = 28,$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>N1</b> |                |
|              | $y = 32$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>N1</b> |                |
|              | Notes:<br>1. Do not accept $\begin{pmatrix} \text{Inverse} \\ \text{matrix} \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 5 & 7 \end{pmatrix}$ or $\begin{pmatrix} \text{Inverse} \\ \text{matrix} \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$<br>2. $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} \text{Inverse} \\ \text{matrix} \end{pmatrix} \begin{pmatrix} 60 \\ 364 \end{pmatrix}$ , award K1<br>3. $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 28 \\ 32 \end{pmatrix}$ as final answer, award N1<br>4. Do not accept any solution solved not using matrix method. |           |                |
| <b>9 (a)</b> | 28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>P1</b> | <hr/> <b>6</b> |
| <b>(b)</b>   | $\frac{28-18}{6-0}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>K1</b> |                |
|              | $\frac{5}{3}$ or 1.67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>N1</b> |                |
| <b>(c)</b>   | $\frac{1}{2} \times (18+28)6 + (t-6)28 = 278$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>K2</b> |                |
|              | Notes:<br>$\frac{1}{2} \times (18+28)6$ or $(t-6)28$<br>award K1<br><br>$t = 11$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>N1</b> |                |

| Soalan                                                                                                                                                                   | Peraturan Permarkahan                                                                                                                                                           | Markah    |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| <b>10(a)</b>                                                                                                                                                             | (i) {(Red,Blue), (Red,Green), (Red,Yellow), (Blue,Red), (Blue,Green), (Blue,Yellow), (Green,Red), (Green,Blue), (Green,Yellow), (Yellow,Red), (Yellow,Blue), (Yellow,Green)}    | <b>P1</b> |          |
|                                                                                                                                                                          | (ii) {(Red, Blue), (Red, Green), (Red, Yellow), (Blue,Red), (Green,Red), (Yellow,Red)}                                                                                          | <b>K1</b> |          |
|                                                                                                                                                                          | $\frac{6}{12}$ or $\frac{1}{2}$                                                                                                                                                 | <b>N1</b> |          |
|                                                                                                                                                                          | (b) (i) {(Ali,Badri), (Ali,Chong), (Ali,Dhilip), (Badri,Chong), (Badri,Dhilip), (Chong,Dhilip)}                                                                                 | <b>P1</b> |          |
|                                                                                                                                                                          | (ii) {(Badri,Chong), (Badri,Dhilip), (Chong,Dhilip)}                                                                                                                            | <b>K1</b> |          |
|                                                                                                                                                                          | $\frac{3}{6}$ or $\frac{1}{2}$                                                                                                                                                  | <b>N1</b> | <b>6</b> |
| <b>11(a)</b>                                                                                                                                                             | $\frac{150}{360} \times 2 \times \frac{22}{7} \times 14$ or $\frac{180}{360} \times 2 \times \frac{22}{7} \times 7$ or $\frac{90}{360} \times 2 \times \frac{22}{7} \times 5$   | <b>K1</b> |          |
|                                                                                                                                                                          | $\frac{150}{360} \times 2 \times \frac{22}{7} \times 14 + \frac{180}{360} \times 2 \times \frac{22}{7} \times 7 + 9 + 5 + \frac{90}{360} \times 2 \times \frac{22}{7} \times 5$ | <b>K1</b> |          |
|                                                                                                                                                                          | $80\frac{11}{21}$ or $\frac{1691}{21}$ or 80.52                                                                                                                                 | <b>N1</b> |          |
|                                                                                                                                                                          | (b) $\frac{150}{360} \times \frac{22}{7} \times 14^2$ or $\frac{180}{360} \times \frac{22}{7} \times 7^2$ or $\frac{90}{360} \times \frac{22}{7} \times 5^2$                    | <b>K1</b> |          |
|                                                                                                                                                                          | $\frac{150}{360} \times \frac{22}{7} \times 14^2 - \frac{180}{360} \times \frac{22}{7} \times 7^2 - \frac{90}{360} \times \frac{22}{7} \times 5^2$                              | <b>K1</b> |          |
|                                                                                                                                                                          | $160\frac{1}{42}$ or $\frac{6721}{42}$ or 160.02                                                                                                                                | <b>N1</b> | <b>6</b> |
| <b>NOTE:</b><br>1. Accept $\pi$ for KN mark.<br>2. Accept correct value from incomplete substitution for K mark.<br>3. Correct answer from incomplete working, award Kk2 |                                                                                                                                                                                 |           |          |

## Bahagian B

| Soalan        | Peraturan Permarkahan                                                                                                                                            | Markah    |           |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
| <b>12 (a)</b> | $y = -24$                                                                                                                                                        | <b>K1</b> | <b>2</b>  |
|               | $y = -14$                                                                                                                                                        | <b>K1</b> |           |
|               | <b>(b) Graph :</b>                                                                                                                                               |           |           |
|               | Axis drawn in correct directions with uniform scales for $-3 \leq x \leq 3.6$                                                                                    | <b>P1</b> | <b>4</b>  |
|               | All 8 points and *2 points correctly plotted or curve passes through all the points for $-3 \leq x \leq 3.6$                                                     | <b>K2</b> |           |
| <b>(c)</b>    | <b>Note:</b>                                                                                                                                                     |           |           |
|               | 1. 7 or 6 points correctly plotted, award K1                                                                                                                     |           |           |
|               | 2. Ignore curve out of range.                                                                                                                                    |           |           |
|               | Smooth and continuous curve without any straight line passing through all 8 correct points using the given scales for $-3 \leq x \leq 3.6$                       | <b>N1</b> | <b>2</b>  |
|               | <b>(i) <math>3.3 \leq x \leq 3.4</math></b>                                                                                                                      | <b>P1</b> |           |
| <b>(d)</b>    | <b>(ii) <math>-14.0 \leq y \leq -16.0</math></b>                                                                                                                 | <b>P1</b> | <b>4</b>  |
|               | Straight line $y = 8x - 16$ correctly drawn.                                                                                                                     | <b>K2</b> |           |
|               | Checked any two points plotted or straight line passes through any two of the (0, -16), (1, 8), (2, 0) ... accurate to $\pm \frac{1}{2}$ square grid vertically) |           |           |
|               | <b>Note:</b>                                                                                                                                                     |           |           |
|               | Identify equation $y = 8x - 16$ award K1                                                                                                                         |           |           |
|               | $3.3 \leq x \leq 3.6$                                                                                                                                            | <b>N1</b> | <b>4</b>  |
|               | $0.25 \leq x \leq 0.35$                                                                                                                                          | <b>N1</b> |           |
|               | <b>NOTE:</b>                                                                                                                                                     |           |           |
|               | 1. Allow <b>P</b> mark or <b>N</b> mark if values of $x$ and $y$ are shown on graph                                                                              |           | <b>12</b> |
|               | 2. Values of $x$ and of $y$ obtained by calculations, award <b>P0</b> or <b>N0</b> .                                                                             |           |           |
|               | 3. Values of $x$ and of $y$ obtained from wrong graph, award <b>P0</b>                                                                                           |           |           |
|               |                                                                                                                                                                  |           |           |

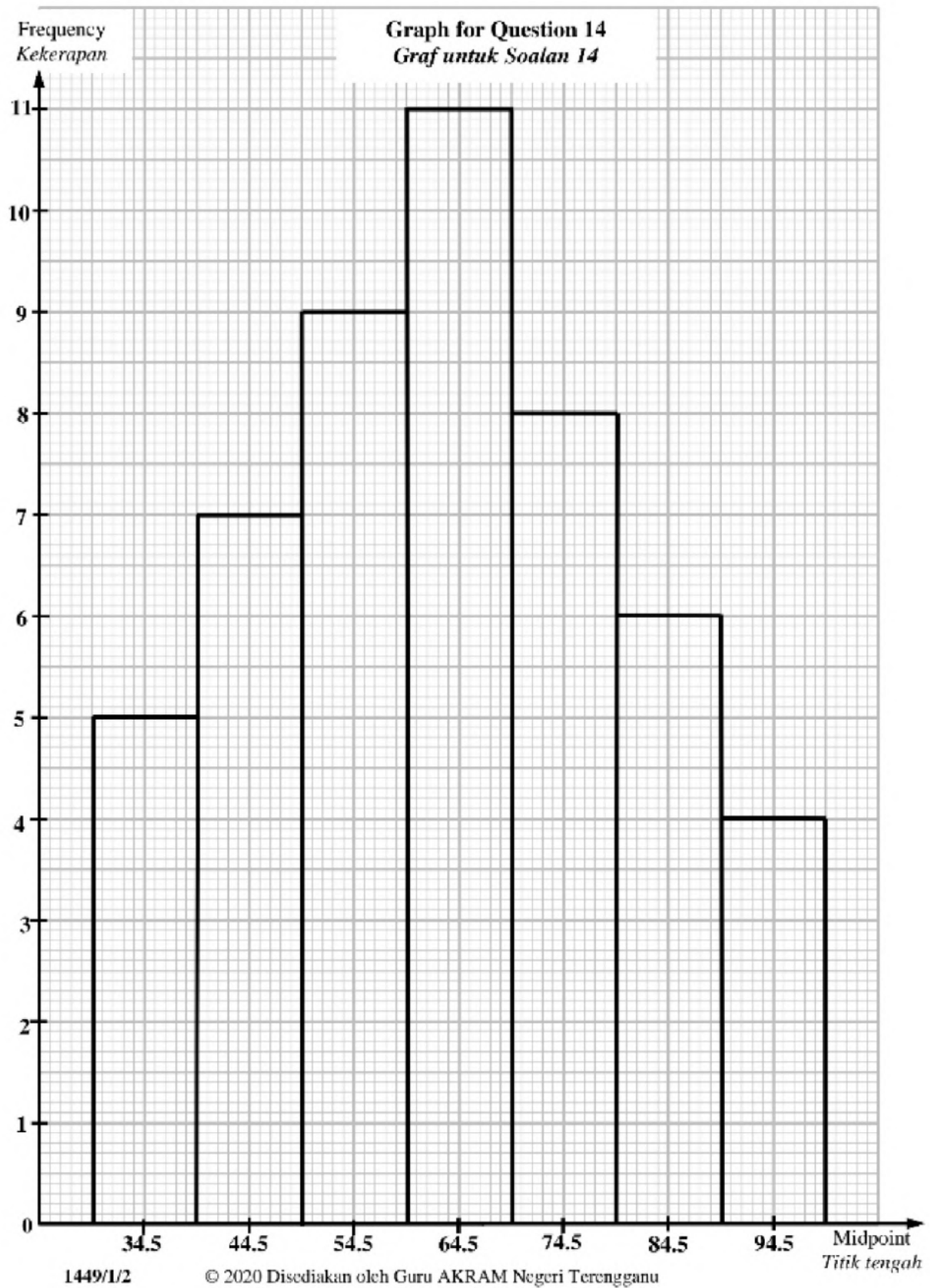


| Soalan | Peraturan Permarkahan                                                                                                                                                                                                        | Markah |          |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|
| 13(a)  | (i) (8, 1)                                                                                                                                                                                                                   | P1     | 3        |
|        | (ii) (3, 6)                                                                                                                                                                                                                  | P2     |          |
|        | Note :<br>(3, 6) is marked on the diagram <u>or</u> (0, 8) is seen <u>or</u> (0, 8) is marked on the marked on the diagram, award P1                                                                                         |        |          |
|        | (b) (i) L = Rotation, centre (3, 7), 90° clockwise //<br><i>Putaran, pusat (3, 7), 90° ikut arah jam</i>                                                                                                                     | P3     |          |
|        | Note:<br>1. Rotation, centre (3, 7) <i>or</i> Rotation, 90° clockwise // <i>Putaran, pusat (3, 7) atau Putaran, 90° ikut arah jam</i> , award P2<br>2. Rotation // <i>Putaran</i> award P1                                   |        |          |
|        | G = Enlargement, scale factor 2, centre ( -3, 6) //<br><i>Pembesaran, faktor skala 2, pusat (-3, 6)</i>                                                                                                                      | P3     |          |
|        | Note:<br>1. Enlargement, scale factor 2 // <i>Pembesaran, faktor skala 2</i> , award P2<br>2. Enlargement, centre (-3, 6) // <i>Pembesaran, pusat O (-3, 6)</i> , award P2<br>3. Enlargement // <i>Pembesaran</i> , award P1 |        |          |
|        | (ii) $*(2)^2 \times 100 - 100$                                                                                                                                                                                               | K2     |          |
|        | $*(2)^2 \times 100$ award K1                                                                                                                                                                                                 |        |          |
|        | 300                                                                                                                                                                                                                          | N1     | 9        |
|        |                                                                                                                                                                                                                              |        | <hr/> 12 |

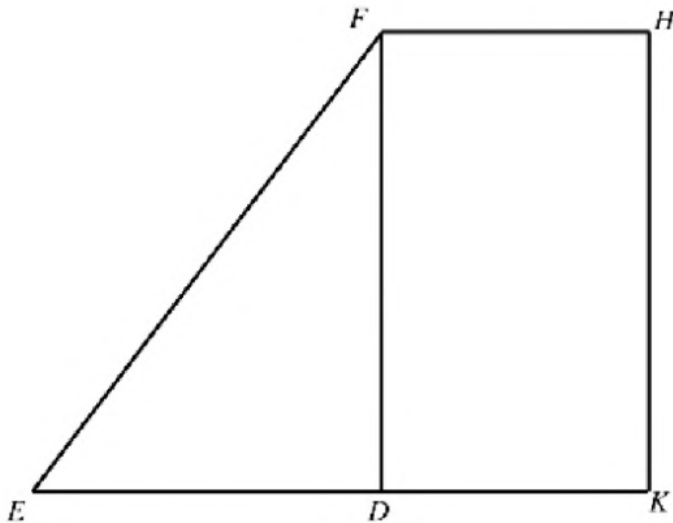


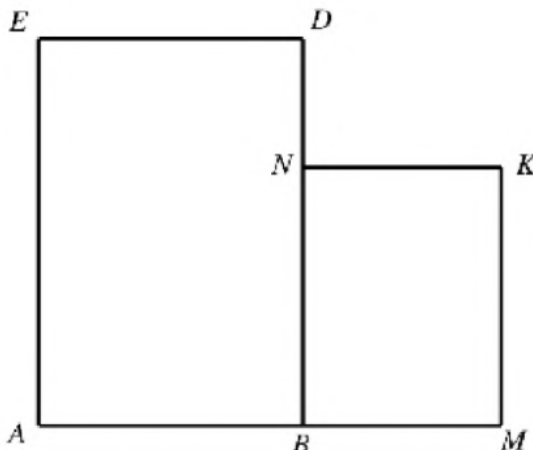
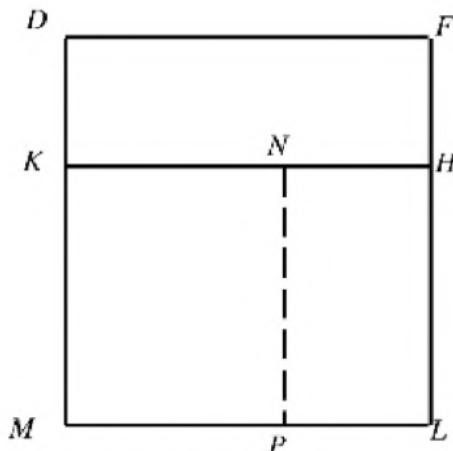
| Soalan | Peraturan Permarkahan                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Markah   |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|----------|---------|---|------|---------|---|------|---------|---|------|---------|----|------|---------|---|------|---------|---|------|---------|---|------|----------------|
| 14(a)  | (i)                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <table><thead><tr><th>Age</th><th>Frequency</th><th>Midpoint</th></tr></thead><tbody><tr><td>30 – 39</td><td>5</td><td>34.5</td></tr><tr><td>40 – 49</td><td>7</td><td>44.5</td></tr><tr><td>50 – 59</td><td>9</td><td>54.5</td></tr><tr><td>60 – 69</td><td>11</td><td>64.5</td></tr><tr><td>70 – 79</td><td>8</td><td>74.5</td></tr><tr><td>80 – 89</td><td>6</td><td>84.5</td></tr><tr><td>90 – 99</td><td>4</td><td>94.5</td></tr></tbody></table> | Age      | Frequency | Midpoint | 30 – 39 | 5 | 34.5 | 40 – 49 | 7 | 44.5 | 50 – 59 | 9 | 54.5 | 60 – 69 | 11 | 64.5 | 70 – 79 | 8 | 74.5 | 80 – 89 | 6 | 84.5 | 90 – 99 | 4 | 94.5 | P1<br>P1<br>P1 |
|        | Age                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                              | Midpoint |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|        | 30 – 39                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 34.5     |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|        | 40 – 49                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 44.5     |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|        | 50 – 59                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 54.5     |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|        | 60 – 69                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 64.5     |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|        | 70 – 79                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 74.5     |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|        | 80 – 89                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 84.5     |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|        | 90 – 99                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 94.5     |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
|        | (ii) 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P1       |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
| (b)    | $\text{Mean} = \frac{(*5 \times 34.5) + (*7 \times 44.5) + (*9 \times 54.5) + (*11 \times 64.5) + (*8 \times 74.5) + (*6 \times 84.5) + (*4 \times 94.5)}{50}$ $= 63.3$ <p><u>Note:</u></p> <p>1. Allow two mistakes for the multiplication of *frequency and midpoint for K1</p> $\frac{633}{10} \text{ or } 63\frac{3}{10} \text{ or } 63.3$ <p>2. Correct answer from incomplete working, award Kk2</p> <p>e.g <math>\frac{3165}{50} @ \frac{633}{10} = 63.3</math></p> | K2<br>N1                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
| (c)    | <p><u>Histogram</u></p> <p>Axes drawn in the correct directions with uniform scale for <math>34.5 \leq x \leq 94.5</math> dan <math>0 \leq y \leq *11</math>.</p> <p>* 6 bars correctly drawn using correct values of class boundary / class interval / midpoint</p> <p><u>Note:</u></p> <p>*5 or *6 bars correctly drawn, award K1</p> <p>Correct histogram using the given scale</p>                                                                                     | P1<br>K2<br>N1                                                                                                                                                                                                                                                                                                                                                                                                                                         |          |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |
| (d)    | $11 + 8 + 6 + 4 = 29$ orang                                                                                                                                                                                                                                                                                                                                                                                                                                                | K1                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |           |          |         |   |      |         |   |      |         |   |      |         |    |      |         |   |      |         |   |      |         |   |      |                |

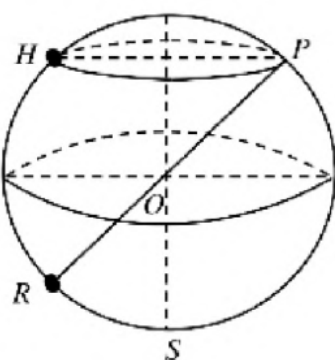
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| Soalan | Peraturan Permarkahan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Markah |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 15     | <p><u>Note:</u></p> <ol style="list-style-type: none"> <li>(1) Accept drawing only (not sketch)</li> <li>(2) Accept diagrams without labels and ignore wrong labels.</li> <li>(3) Accept correct rotation of diagrams.</li> <li>(4) Lateral inversions are not accepted.</li> <li>(5) If more than 1 diagram are drawn, award mark to the correct ones only.</li> <li>(6) For extra lines (dotted/dashed or solid) except construction lines, no <b>KN</b> mark is awarded.</li> <li>(7) If other scales are used with accuracy of <math>\pm 0.2</math> cm one way, deduct 1 mark from the <b>N</b> mark obtained, for each part attempted.</li> <li>(8) Accept small gaps or extensions at the corners.<br/>For each part attempted:               <ol style="list-style-type: none"> <li>(i) If <math>0.1 \text{ cm} \leq \text{small gaps/extension} \leq 0.4 \text{ cm}</math>, deduct 1 mark from <b>N</b> mark obtained.</li> <li>(ii) If small gaps/extensions <math>&gt; 0.4 \text{ cm}</math>, no <b>N</b> mark is awarded.</li> </ol> </li> <li>(9) If the construction line cannot be differentiated from the actual lines:               <ol style="list-style-type: none"> <li>(i) <u>Dotted line</u><br/>If outside the diagram, award the <b>N</b> mark.<br/>If inside the diagram, award <b>N0</b>.</li> <li>(ii) <u>Solid line</u><br/>If outside the diagram, no <b>KN</b> mark is awarded.</li> </ol> </li> <li>(10) For double lines, non –collinear lines, bold lines or crooked lines, deduct 1 mark from the <b>N</b> mark obtained, for each part attempted.</li> <li>(11) If drawn on graph paper, no <b>KN</b> mark is awarded.</li> </ol> |        |

| Soalan | Peraturan Permarkahan                                                                                                                                                                                                                                                                                                                                                                         | Markah                                             |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| 15(a)  |  <p>Correct shape with rectangle <math>DKHF</math> and <math>DEF</math> right angled triangle.<br/>All solid lines,</p> <p><math>EK &gt; KH &gt; ED &gt; DK = FH</math></p> <p>Measurements correct to <math>\pm 0.2</math> cm (one way) and all angles at vertices = <math>90^\circ \pm 1^\circ</math></p> | <p><b>K1</b></p> <p><b>K1</b></p> <p><b>N1</b></p> |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                       |           |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------|
| (b) | <p>(i)</p>  <p>Correct shape with rectangles <math>ABDE</math> and <math>BMKN</math>.<br/>All solid lines.</p> <p><math>AM &gt; AE &gt; KM &gt; KN &gt; ND</math></p> <p>Measurements correct to <math>\pm 0.2</math> cm (one way) and all angles at vertices = <math>90^\circ \pm 1^\circ</math></p> <p>(ii)</p>  <p>Correct shape with rectangles <math>KMLH</math> and <math>DFHK</math>.<br/>All solid lines.<br/>(Ignore <math>NP</math>)</p> <p><math>N - P</math> joined by a dashed line to form rectangle <math>KMLH</math>.</p> <p><math>DM &gt; ML &gt; LH &gt; KN &gt; HF = HN</math></p> <p>Measurements correct to <math>\pm 0.2</math> cm (one way) and all angles at vertices = <math>90^\circ \pm 1^\circ</math></p> | <p>K1</p> <p>K1</p> <p>N2</p> <p>K1</p> <p>K1</p> <p>K1</p> <p>N2</p> | <p>12</p> |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------|

| Soalan | Peraturan Permarkahan                                                                                           | Markah |           |
|--------|-----------------------------------------------------------------------------------------------------------------|--------|-----------|
| 16(a)  |                                | P1     |           |
|        |                                                                                                                 | P1     | 2         |
|        | (b) $60^\circ \times 60'$<br>3600 n.m                                                                           | K1     |           |
|        |                                                                                                                 | N1     | 2         |
|        | (c) $\frac{4500}{60}$ or 75<br>$\frac{4500}{60} - 60$<br>$15^\circ S$                                           | K1     |           |
|        |                                                                                                                 | K1     |           |
|        |                                                                                                                 | N1     | 3         |
|        | (d) (i) $120 \times 60 \times \cos 60^\circ$<br><br><u>Note :</u><br>Using $\cos 60^\circ$ award K1<br><br>3600 | K2     |           |
|        |                                                                                                                 | N1     |           |
|        | (ii) $\frac{3600 + 4500}{580}$<br><br>13.97                                                                     | K1     |           |
|        |                                                                                                                 | N1     | 5         |
|        |                                                                                                                 |        | <u>12</u> |

**SKEMA PEMARKAHAN TAMAT**

**KELANTAN**

***KERTAS***

**2**

**Section A**  
**Bahagian A**

[52 marks]

[52 markah]

Answer **all** questions in this section.

Jawab **semua** soalan dalam bahagian ini.

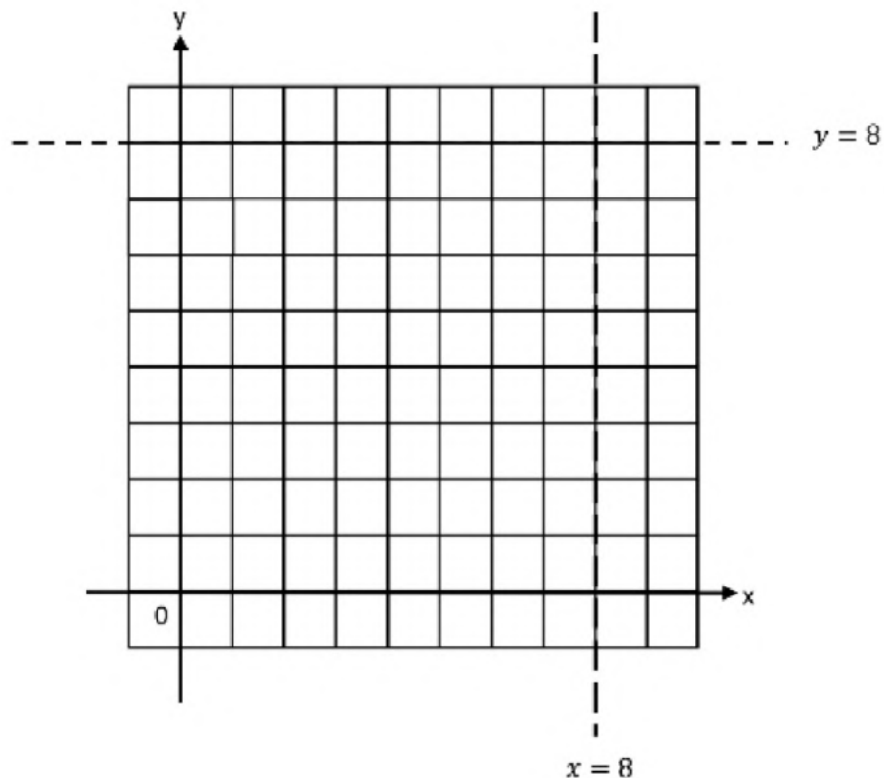
1. On the graph in the answer space, shade the region which satisfy the three inequalities  $y \geq -x + 8$ ,  $y < 8$  dan  $x < 8$ .

Pada graf di ruang jawapan, lorek rantau yang memuaskan ketiga-tiga ketaksamaan

$y \geq -x + 8$ ,  $y < 8$  dan  $x < 8$ .

[3 marks/3 markah]

Answer / Jawapan:





2. A car moving at speed  $12t$  km/h from town P to town Q. Calculate the value of  $t$  if the car travels 720 km in  $(t + 4)$  hours.

*Sebuah kereta bergerak dengan kelajuan  $12t$  km/j dari bandar P ke bandar Q. Hitung nilai  $t$ , jika kereta itu bergerak sejauh 720 km dalam masa  $(t + 4)$  jam.*

(4 marks/4 markah)

Answer / Jawapan :

3. Mujiana's age is twice the age of the younger sister. 12 years ago, Mujiana's age was six times her younger sister's age. Without using the matrix method, calculate the ages of Mujiana and her younger sister.

*Mujiana adalah berusia dua kali umur adiknya. 12 tahun yang lalu, umur Mujiana adalah enam kali umur adiknya. Tanpa menggunakan kaedah matriks, hitung masing-masing umur Mujiana dan adiknya.*

(4 marks/ 4 markah)

Answer / Jawapan :

4. Diagram 1 shows a cube with a rectangular of PQRS. X, Y and Z are midpoints TW, PS and QR, respectively. Given that  $TP = 5\text{cm}$  and  $PQ = 8\text{cm}$

*Rajah 1 menunjukkan sebuah kuboid dengan tapak segiempat tepat PQRS. X, Y dan Z masing-masing ialah titik tengah TW, PS dan QR. Diberi  $TP = 5\text{cm}$  dan  $PQ = 8\text{cm}$ .*

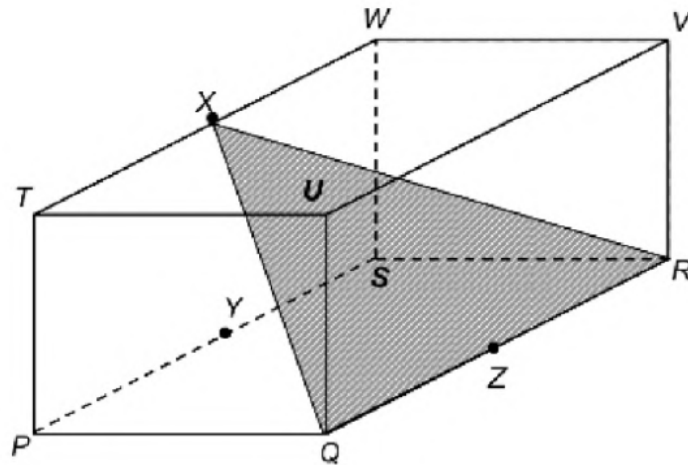


Diagram 1 /Rajah 1

- (a) Name the angle between the QRX plane and the PQRS plane.  
*Namakan sudut di antara satah QRX dengan satah PQRS.*
- (b) Calculate the angle between the QRX plane and the PQRS plane.  
*Hitung sudut di antara satah QRX dengan satah PQRS.*

(3 marks/ 3 markah)

Answer/Jawapan:

(a)

(b)

5. (a) Given matrix  $R = \begin{pmatrix} -z & 5 \\ z-1 & 1 \end{pmatrix}$ , find the value of  $z$  if matrix  $R$  has **no** inverse.

*Diberi bahawa matriks  $R = \begin{pmatrix} -z & 5 \\ z-1 & 1 \end{pmatrix}$ , cari nilai bagi  $z$  jika matriks  $R$  **tidak** mempunyai songsangan.*

- (b) By using matrix method, calculate the value of  $p$  and  $q$  which satisfy the simultaneous linear equations.

*Dengan menggunakan kaedah matriks, carikan nilai  $p$  dan  $q$  yang memuaskan persamaan linear serentak berikut:*

$$\frac{-3}{2}p + q = 6$$

$$p - 2q = -8$$

(6 marks/ 6 markah)

Answer / Jawapan :

(a)

(b)

6. (a) Write down two statements that have been combined with the word "and" in the following statement.

*Tulis dua pernyataan yang telah digabungkan dengan perkataan "dan" dalam pernyataan berikut.*

35 is an odd number and the multiple of 7.  
 35 ialah nombor ganjil dan gandaan bagi 7.

- (b) Complete the premise of the following argument:

*Lengkapkan premis bagi hujah berikut:*

Premise 1/ Premis 1:.....

Premise 2/ Premis 2:  $2x + 10 \neq 20$

Conclusion/ Kesimpulan:  $x \neq 5$

- (c) It is given that the area of image with scale of factor,  $k$  is

$k^2 \times \text{area of the object}$ . Make one conclusion by deduction on the area of image,  $P'$  with scale of factor,  $k = 2$  and area of the object,  $P$  is 24 unit<sup>2</sup>.

*Diberi bahawa luas imej dengan faktor skala,  $k$  ialah  $k^2 \times \text{luas objek}$ . Buat satu kesimpulan secara deduksi bagi luas imej,  $P'$  dengan faktor skala,  $k = 2$  dan luas objek,  $P$  ialah 24 unit<sup>2</sup>.*

(5 marks/ 5 markah)

Answer / Jawapan :

(a) (i).....

(ii).....

(b) Premise 1/ Premis 1 : :.....

.....

(c)

7. Diagram 2 shows the straight line  $JK$  is parallel to the straight line  $MN$ . The equation of  $MN$  is  $3x - y = 9$ .

*Rajah 2 menunjukkan garis lurus  $JK$  adalah selari dengan garis lurus  $MN$ . Persamaan  $MN$  ialah  $3x - y = 9$ .*

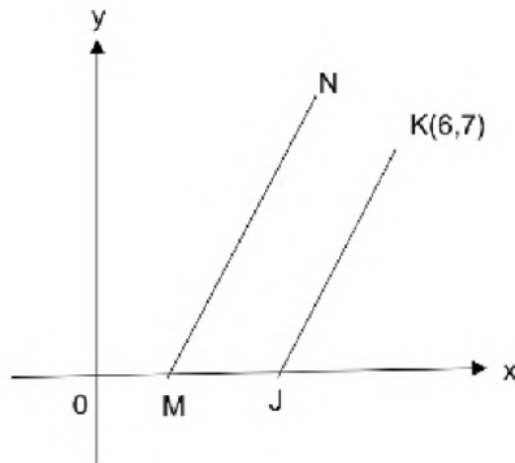


Diagram 2 / Rajah 2

Find/Cari

- (a) the equation of  $KJ$   
*persamaan bagi garis lurus  $KJ$*
- (b) the  $x$ -intercept of  $KJ$ .  
*pintasan- $x$  bagi  $KJ$ .*

[5 marks / 5 markah]

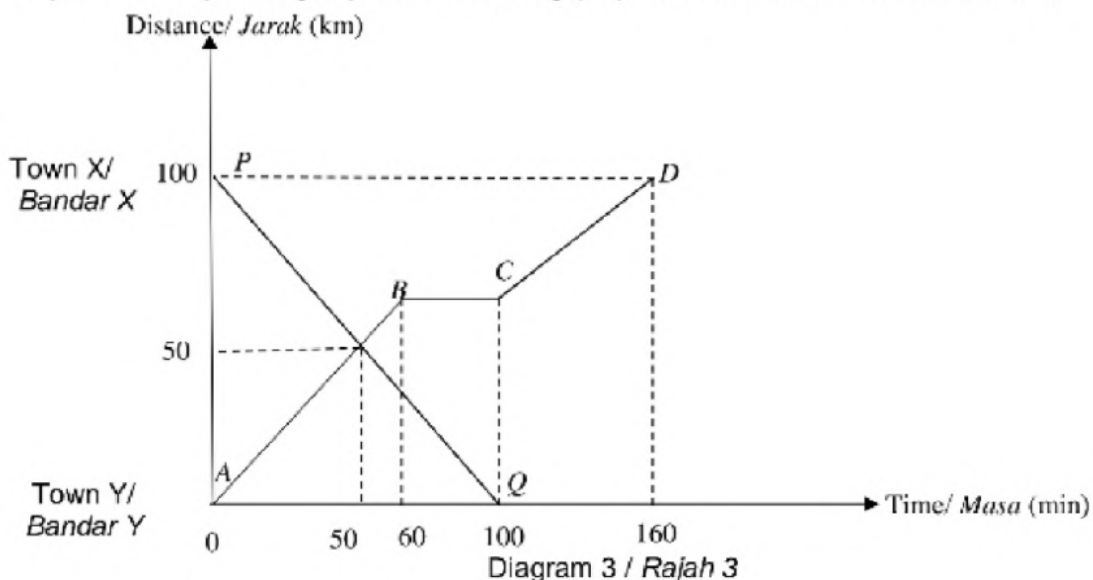
Answer / Jawapan:

(a)

(b)

8. Diagram 3 shows the distance – time graph of the journey of a lorry and a bus.

Rajah 3 menunjukkan graf jarak – masa bagi perjalanan sebuah lori dan sebuah bas.



The graph  $PQ$  represents the journey of the lorry from Town  $X$  to Town  $Y$  and the graph  $ABCD$  represents the journey of the bus from Town  $Y$  to Town  $X$ . Both the vehicles start their journey at 9.30 a.m. and travel the same highway.

Graf  $PQ$  mewakili perjalanan lori itu dari Bandar  $X$  ke Bandar  $Y$  dan graf  $ABCD$  mewakili perjalanan bas itu dari Bandar  $Y$  ke Bandar  $X$ . Kedua-dua kenderaan itu bermula jam 9.30 a.m. dan melalui jalan raya yang sama.

- (a) What time did the bus continue its journey to Town  $X$  after being at rest for 40 minutes?

Pukul berapakah bas itu menyambungkan perjalanannya ke Bandar  $X$  selepas berehat selama 40 minit?

- (b) The two vehicles meet after traveling for  $t$  minutes.

Kedua-dua kenderaan itu bertemu selepas bergerak selama  $t$  minit.

- (i) State the value of  $t$ .

Nyatakan nilai  $t$ .

- (ii) At what time did the vehicles meet?

Pukul berapakah kenderaan tersebut bertemu?

- (c) Calculate the average speed, in  $\text{kmh}^{-1}$ , of the bus for the whole journey.

Hitung purata laju, dalam  $\text{km j}^{-1}$ , bus itu bagi keseluruhan perjalanan.

(6 marks/ 6 markah)

*Answer/jawapan :*

(a)

(b)(i)

(ii)

(c)

9. The Diagram 4 shows some round shaped cards labeled even and odd numbers in two containers M and N.

*Rajah 4 menunjukkan beberapa keping kad yang berbentuk bulat yang berlabel nombor genap dan nombor ganjil di dalam dua buah bekas M dan N.*

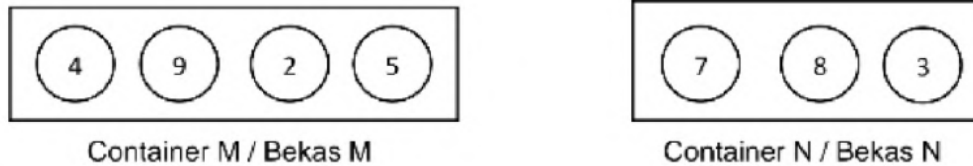


Diagram 4 / Rajah 4

Two cards are randomly selected, one from container M and the other from container N and the card is recorded as a two-digit number ending.

*Dua keping kad dipilih secara rawak, satu dari bekas M dan satu lagi dari bekas N dan kad itu dicatat sebagai suatu kesudahan nombor dua digit.*

(a) List the sample space

*Senaraikan ruang sampel*

(b) By listing all possible outcomes, calculate the probability that:

*Dengan menyenaraikan semua kesudahan yang mungkin, hitung kebarangkalian bahawa:*

(i) Both cards labeled with prime numbers are selected

*Kedua-dua kad berlabel nombor perdana dipilih*

(ii) Cards labeled perfect squares or cards labeled multiples of four are selected

*Kad berlabel kuasa dua sempurna atau kad berlabel nombor gandaan empat dipilih*

(6 Marks/ 6 markah)



Answer/Jawapan:

(a)

(b) (i)

(ii)

10. Diagram 5 shows a combined solid consist a hemisphere and a cylinder which lies on the horizontal plane.

*Rajah 5 menunjukkan sebuah gabungan pepejal yang terbentuk daripada cantuman sebuah hemisfera dan sebuah silinder yang terletak pada satah mengufuk.*

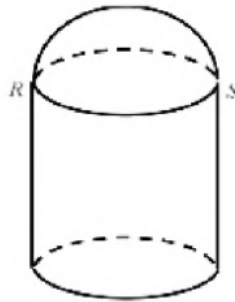


Diagram 5 / Rajah 5

It is given that diameter of the cylinder is 12 cm and the volume of the combined solid is  $1584\text{cm}^3$ . Using  $\pi = \frac{22}{7}$ , calculate the height, in cm, of the cylinder.

*Diberi bahawa diameter silinder ialah 12 cm dan isipadu gabungan pepejal ialah  $1584\text{cm}^3$ . Menggunakan  $\pi = \frac{22}{7}$ , hitung tinggi, dalam cm, silinder itu.*

(4 marks/ 4 markah)

Answer / Jawapan:

11. In Diagram 6,  $OPQ$  is a sector of a circle with centre  $O$  and  $CPD$  is a quadrant with centre  $C$ .

*Dalam Rajah 6,  $OPQ$  ialah sektor bulatan yang berpusat  $O$  dan  $CPD$  ialah sukuan bulat yang berpusat  $C$ .*

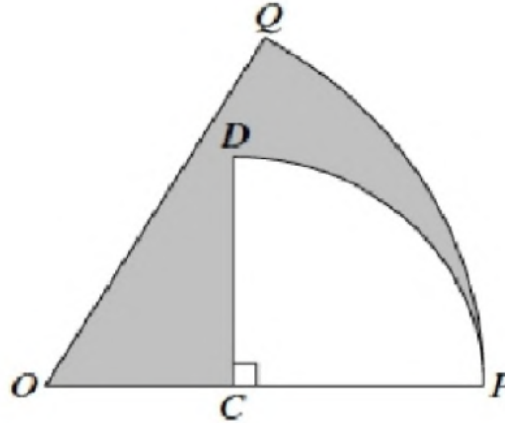


Diagram 6/ Rajah 6

It is given that  $OQ = 16$  cm,  $CP = 10$  cm and  $\angle POQ = 60^\circ$ .

*Diberi bahawa  $OQ = 16$  cm,  $CP = 10$  cm dan  $\angle POQ = 60^\circ$ .*

[use / guna  $\pi = \frac{22}{7}$ ]

Calculate/ hitungkan

- the perimeter, in cm, of the shaded region.  
*perimeter, dalam cm, kawasan yang berlorek*
- the area, in  $\text{cm}^2$ , of the shaded region,  
*luas, dalam  $\text{cm}^2$ , kawasan yang berlorek.*

[6 mark / 6 markah]

Answer / Jawapan:

(a)

(b)

**Section B****Bahagian B**

[48 marks]

[48 markah]

Answer any **four** questions in this section.*Jawab mana-mana empat soalan dalam bahagian ini.*

12. (a) Complete Table 1 for the equation  $y = x^3 - 11x + 2$  by writing down the values of  $y$  when  $x = -1$  and  $x = 3$ .

*Lengkapkan Jadual 1 di ruang jawapan bagi persamaan  $y = x^3 - 11x + 2$  dengan menulis nilai-nilai bagi  $y$  apabila  $x = -1$  dan  $x = 3$ .*

[2 marks/2 markah]

- (b) For this part of the question, use the graph paper on the page 19. You may use a flexible curve ruler.

By using a scale of 2 cm to represent 1 unit on the  $x$ -axis and a scale of 2 cm to represent 5 units on the  $y$ -axis, draw the graph of  $y = x^3 - 11x + 2$  for  $-3 \leq x \leq 4$ .

*Untuk ceraian soalan ini, gunakan kertas graf yang disediakan pada halaman 19. Anda boleh menggunakan pembaris fleksibel.*

*Dengan menggunakan skala 2 cm kepada 1 unit pada paksi- $x$  dan 2 cm kepada 5 unit pada paksi- $y$ , lukiskan graf  $y = x^3 - 11x + 2$  bagi  $-3 \leq x \leq 4$*

[4 marks/ 4 markah]

- (c) From your graph in 12(b), find

*Daripada graf anda di 12(b), cari*

- (i) then value of  $y$  when  $x = 2.5$ ,

*cari nilai  $y$  apabila  $x = 2.5$*

- (ii) then negative value of  $x$  when  $y = 7$

*cari nilai  $x$  yang negatif apabila  $y = 7$*

[2 mark/2 markah]

- (d) Draw a suitable straight line on the same axes to find the values of  $x$  which satisfy the equation  $x^3 - 12x = -7$  for  $-3 \leq x \leq 4$ . State these values of  $x$ .

*Lukis satu garis lurus yang sesuai pada graf di 12(b) untuk mencari nilai-nilai  $x$  yang memuaskan persamaan  $x^3 - 12x = -7$  untuk  $-3 \leq x \leq 4$ .*

[4 marks/4 markah]

Answer/Jawapan:

(a)

|     |    |    |    |   |    |     |   |     |    |
|-----|----|----|----|---|----|-----|---|-----|----|
| $x$ | -3 | -2 | -1 | 0 | 1  | 2   | 3 | 3.5 | 4  |
| $y$ | 8  | 16 |    | 2 | -8 | -12 |   | 6.4 | 22 |

Table 1 / Jadual 1

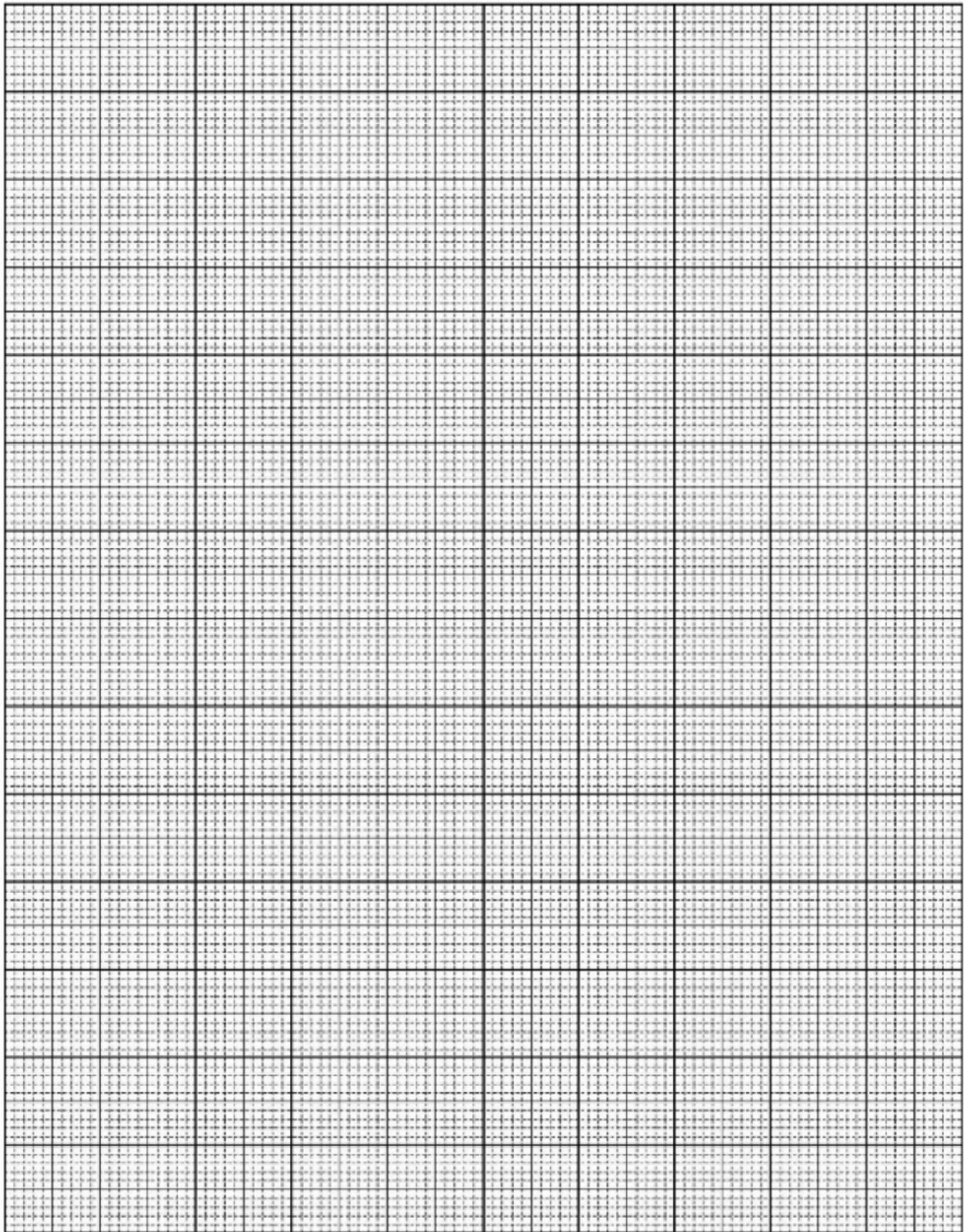
(b) Refer graph on page 19.

*Rujuk graf di halaman 19.*

(c) (i)  $y = \dots\dots\dots$

(ii)  $x = \dots\dots\dots$

(d)  $x = \dots\dots\dots, \dots\dots\dots$



13. (a) Given  $X$  is a reflection in the line  $y = x$  and  $Y$  is an anticlockwise rotation of  $90^\circ$  about the centre  $(2, 2)$ . Determine the coordinates of the image of point  $(4, 3)$  under each combined transformation below.

*Diberi  $X$  ialah pantulan pada garis  $y = x$  dan  $Y$  ialah putaran  $90^\circ$  lawan arah jam pada pusat  $(2, 2)$ . Tentukan koordinat imej bagi titik  $(4, 3)$  di bawah setiap gabungan penjelmaan yang berikut.*

(i)  $Y^2$

(ii)  $X^2$

[3 marks / 3 markah]

- (b) Diagram shows trapezium ABCD, EFGH, and JKLM, drawn on a Cartesian plane.

*Rajah menunjukkan sebuah trapezium ABCD, EFGH, dan JKLM, dilukis di satah Cartesian.*

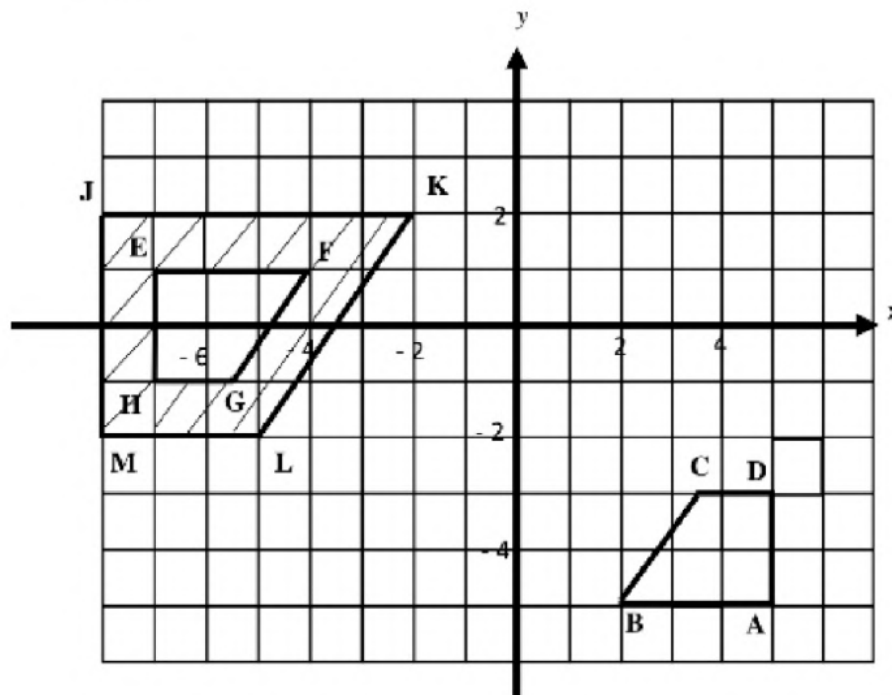


Diagram 7 / Rajah 7

EFGH is the image of JKLM under the transformation of P. While ABCD is the image of EFGH under transformation of Q.

*EFGH ialah imej bagi JKLM di bawah penjelmaan P, manakala ABCD ialah imej bagi EFGH di bawah penjelmaan Q. Huraikan selengkapnya :*

- (i) Transformation P/*Penjelmaan P*
- (ii) Transformation Q/*Penjelmaan Q*

[6 marks/ 6 markah]

- (c) Given a shaded area of  $60 \text{ cm}^2$ . Calculate the area, in  $\text{cm}^2$ , JKLM.

*Diberi luas kawasan berlorek ialah  $60 \text{ cm}^2$ . Hitung luas, dalam  $\text{cm}^2$ , JKLM.*

[3 marks / 3 markah]

Answer/*Jawapan:*

(a)(i)

(ii)

(b)(i)P:.....  
 .....

(ii)Q:.....  
 .....

(c)



14. A group of 40 students are attending Mathematics Camp. The data in Table 2 shows the distances, in km, between their houses and the camp.

*Sekumpulan 40 orang murid sedang menghadiri Kem Matematik. Data di Jadual 2 menunjukkan jarak, dalam km, antara rumah mereka dengan kem itu.*

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 19 | 41 | 42 | 38 | 28 | 32 | 34 | 25 |
| 42 | 32 | 46 | 32 | 18 | 23 | 25 | 27 |
| 33 | 36 | 25 | 21 | 43 | 37 | 42 | 30 |
| 47 | 26 | 33 | 24 | 38 | 22 | 18 | 35 |
| 39 | 37 | 27 | 30 | 41 | 34 | 23 | 48 |

Table 2 / Jadual 2

- (a) Based on the data in Table 2 complete table 3 in the answer space.

*Berdasarkan data di Jadual 2, lengkapkan jadual 3 di ruang jawapan.*

(4 marks/4 markah)

- (b) Based on the Table 3, calculate the estimated mean of the distance between the students' houses and the camp.

*Berdasarkan Jadual 3, hitung min anggaran jarak antara rumah pelajar-pelajar itu dengan kem tersebut*

(3 marks/ 3 markah)

- (c) For this part of question, use the graph paper provided on page 24.

*Untuk ceraian soalan ini, gunakan kertas graf yang disediakan di halaman 24.*

By using scale of 2cm to 5 km on the horizontal axis and 2cm to 1 student on the vertical axis, draw a histogram for the data.

*Menggunakan skala 2cm kepada 5km pada paksi mengufuk dan 2cm kepada 1 pelajar pada paksi mencancang, lukis satu histogram bagi data tersebut.*

(4 marks/ 4 markah)

- (d) State one information based on the histogram in (d)

*Nyatakan satu maklumat berdasarkan histogram di (d)*

(1 mark/ 1 markah)

Answer / Jawapan :

(a)

| <b>Distance (km)</b><br><b>Jarak (km)</b> | <b>Frequency</b><br><b>Kekerapan</b> | <b>Midpoint</b><br><b>Titik Tengah</b> |
|-------------------------------------------|--------------------------------------|----------------------------------------|
| 15-19                                     | 3                                    |                                        |
|                                           |                                      |                                        |
|                                           |                                      |                                        |
|                                           |                                      |                                        |
|                                           |                                      |                                        |
|                                           |                                      |                                        |
|                                           |                                      |                                        |

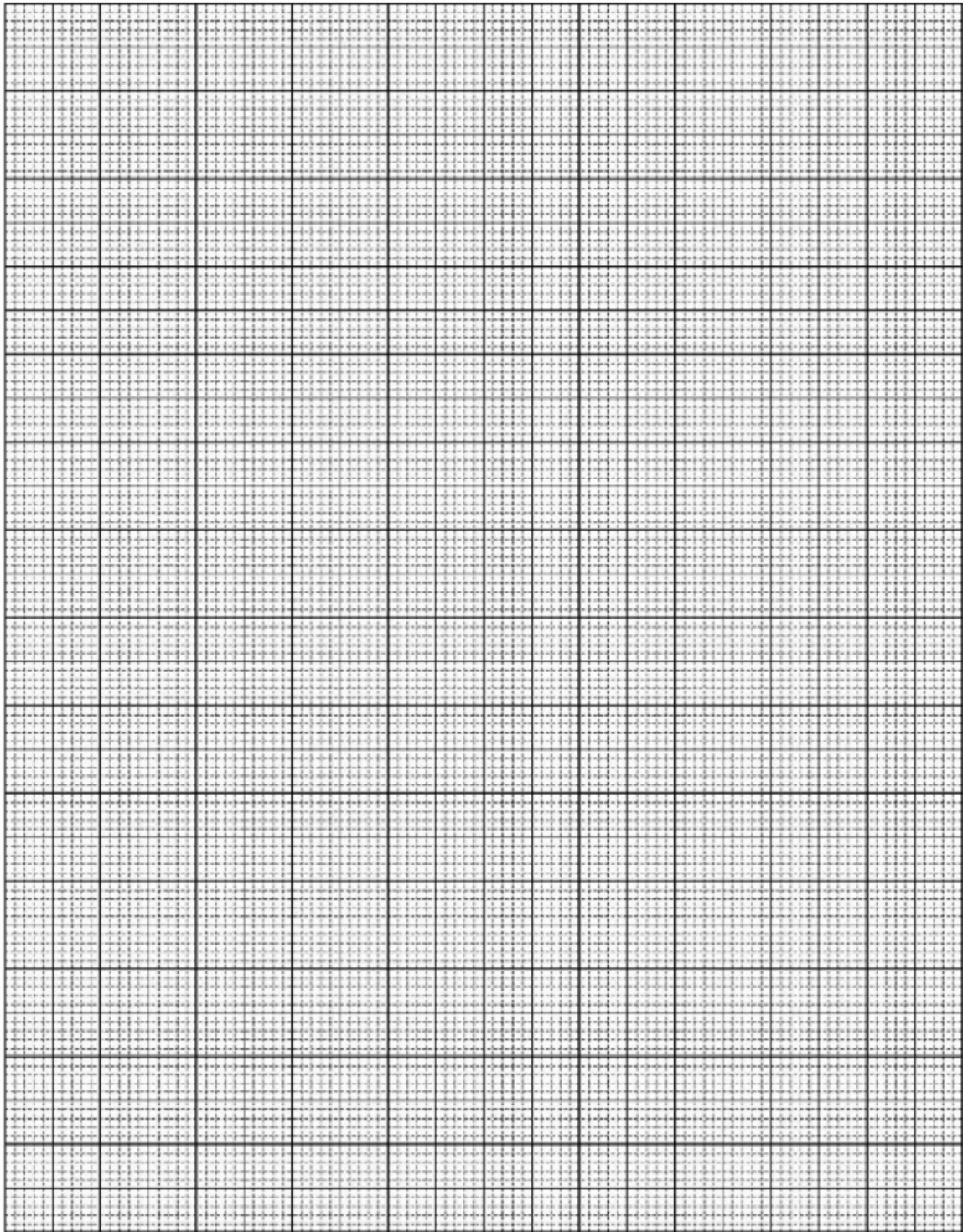
Table 3 / *Jadual 3*

(b)

(c) Refer to the graph on page 24.

Rujuk graf di halaman 24.

(d)



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

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

(a) Diagram 9(i), shows a solid with a rectangular base, DEFG, on a horizontal surface. Rectangles SPUT are inclined. Edges TD, SH, JE, MF, PN and UG are vertical. Given that  $HJ = JE = 3$  cm.

*Rajah 9(i), menunjukkan sebuah pepejal dengan tapak segi empat tepat, DEFG, di atas suatu permukaan mengufuk. Segi empat tepat SPUT adalah satah condong. Tepi TD, SH, JE, MF, PN dan UG adalah tegak. Diberi  $HJ = JE = 3$  cm.*

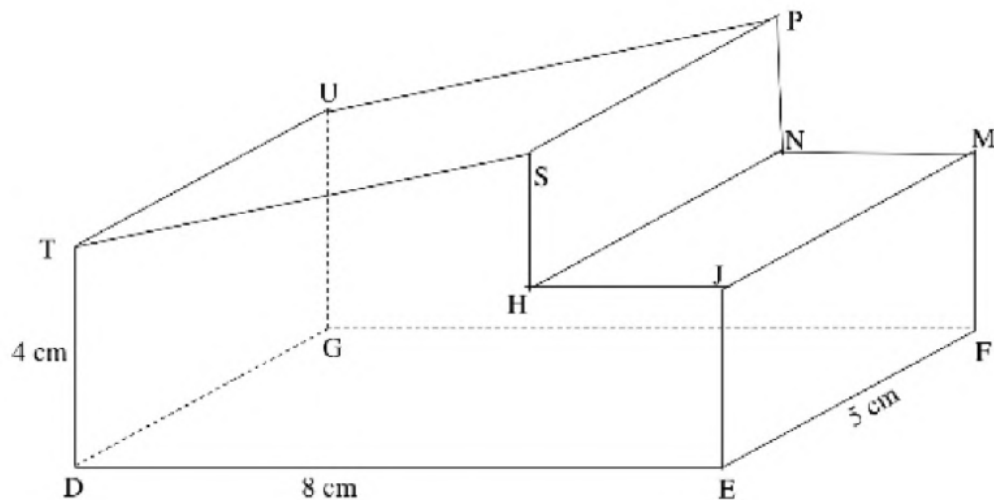


Diagram 9(i) / Rajah 9(i)

Draw at full scale, the plan of the solid.

*Lukis dengan skala penuh, pelan pepejal itu.*

[3 marks / 3 markah]

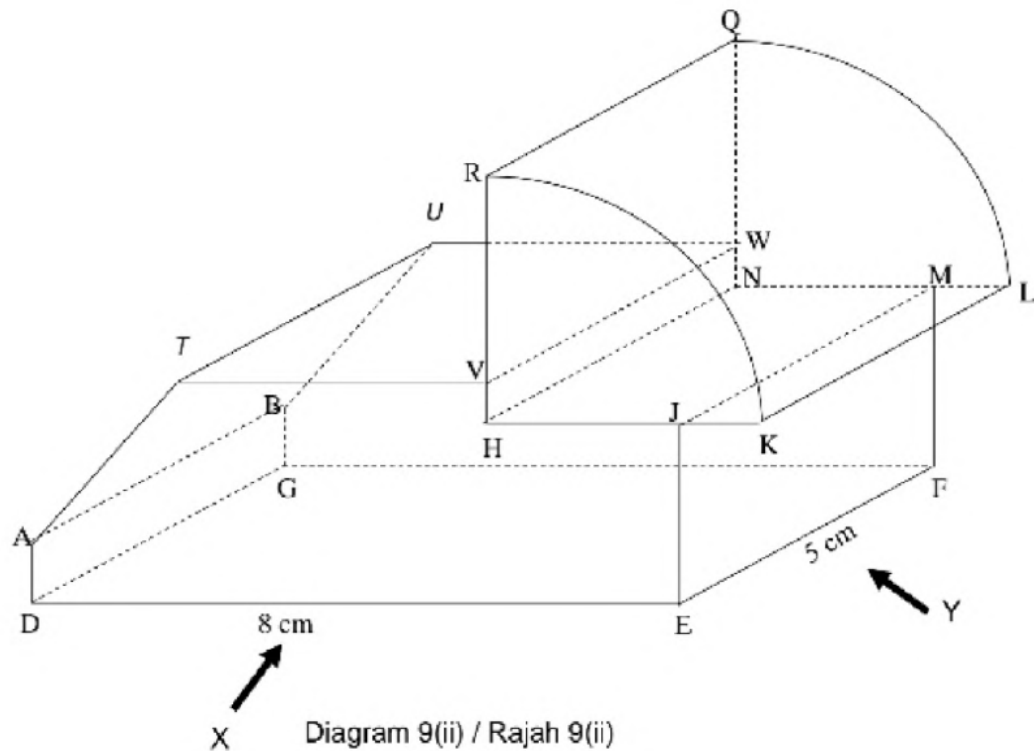
Answer / Jawapan:

(a)

(b) Diagram 9(i) has been cut and removed on the SPUT plane. The quadrant of the cylinder is attached to the solid on the horizontal plane of HJMN as shown in Diagram 9(ii). Given that the radius of the cylinder is 4 cm = TV. Given  $AD = BG = WN = ML = VH = JK = 1$  cm

Rajah 9(i) telah dipotong dan dikeluarkan pada satah SPUT. Sukuan silinder dicantumkan kepada pepejal pada satah mengufuk HJMN seperti yang ditunjukkan dalam Rajah 9(ii).

Diberi jejari silinder itu ialah 4 cm = TV. Diberi  $AD = BG = WN = ML = VH = JK = 1$  cm



Draw at full scale,

*Lukis dengan skala penuh,*

(i) The elevation of the composite solid on a vertical plane parallel to the straight line DE, as viewed from X.

*Dongakan gabungan pepejal itu pada satah mencancang yang selari dengan garis lurus DE, sebagaimana dilihat dari X.*

[4 marks / 4 markah]

(ii) The elevation of the composite solid on a vertical plane parallel to the straight line EF, as viewed from Y.

*Dongakan gabungan pepejal itu pada satah mencancang yang selari dengan garis lurus EF, sebagaimana dilihat dari Y.*

[5 marks / 5 markah]

*Answer / Jawapan:*

(b)(i)

(b)(ii)

16. W( $45^\circ$  S,  $60^\circ$  E), X( $\theta^\circ$  N,  $60^\circ$  E), Y( $45^\circ$  S,  $28^\circ$  W) and Z are four points on the surface of the earth. WZ is the diameter of the earth.

W( $45^\circ$  S,  $60^\circ$  T), X( $\theta^\circ$  U,  $60^\circ$  T), Y( $45^\circ$  S,  $28^\circ$  B) dan Z ialah empat titik pada permukaan bumi. WZ ialah diameter bumi.

- (a) State the location of point Z.

*Nyatakan kedudukan titik Z.*

[3 marks / 3 markah]

- (b) X is 3 900 nautical miles from W, measured along the same meridian. Calculate the value of  $\theta$ .

*X adalah 3 900 batu nautika dari W, diukur sepanjang meridian yang sama. Hitung nilai bagi  $\theta$ .*

[3 marks / 3 markah]

- (c) Calculate the distance, in nautical mile, from Y due east to W, measured along the common parallel of latitude.

*Hitung jarak, dalam batu nautika, dari Y arah timur ke W, diukur sepanjang selarian latitud sepunya.*

[3 marks / 3 markah]

- (d) An aeroplane took off from Y and flew due east to W. Then, it flew due north to X. The average speed of the aeroplane was 450 knots. Calculate the time taken, in hour, for the whole flight.

*Sebuah kapal terbang berlepas dari Y dan terbang arah timur ke W. Kemudian ia terbang arah utara ke X. Purata laju kapal terbang itu ialah 450 knot. Hitung masa, dalam jam, yang diambil bagi keseluruhan penerbangan itu.*

[3 marks / 3 markah]

*Answer/Jawapan:*

(a)

(b)

(c)

(d)

*END OF QUESTION PAPER*

*KERTAS SOALAN TAMAT*



*Skema*

**KELANTAN**

***KERTAS***

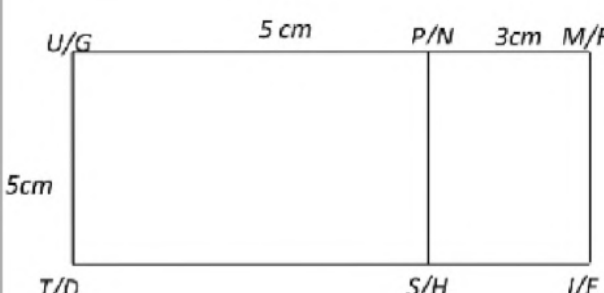
**2**



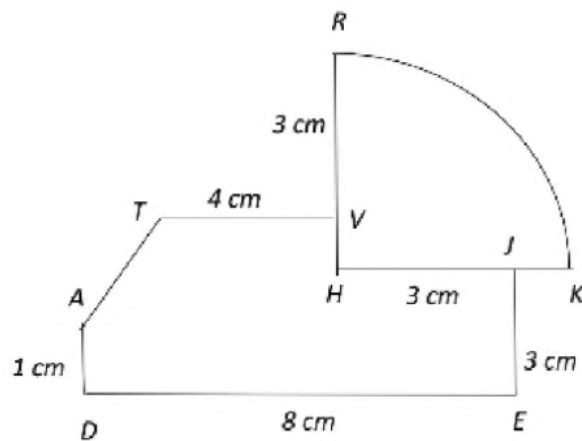
|    |       |                                                                                                |                        |   |
|----|-------|------------------------------------------------------------------------------------------------|------------------------|---|
| 6. | (a)   | 35 ialah nombor ganjil<br><br>35 ialah gandaan 7                                               | P1<br><br>P1           | 5 |
|    | (b)   | Jika $x = 5$ , maka $2x + 10 = 20$                                                             | P1                     |   |
|    | (c)   | luas = $2^2 \times 24$<br><br>= 96                                                             | K1<br><br>N1           |   |
| 7. | (a)   | $m = 3$<br><br>$c = -11$<br><br>$y = 3x - 11$                                                  | P1<br><br>K1<br><br>N1 | 5 |
|    | (b)   | $0 = 3x - 11$<br><br>Pintasan- $x = \frac{11}{3}$                                              | K1<br><br>N1           |   |
|    |       |                                                                                                |                        |   |
| 8. | (a)   | 9.30 + 100 minit<br><br>11.10 a.m                                                              | K1<br><br>N1           | 6 |
|    | (b)   | 50<br><br>10.20 a.m                                                                            | P1<br><br>P1           |   |
|    | (c)   | $\frac{100}{(\frac{160}{60})}$<br><br>37.5                                                     | K1<br><br>N1           |   |
| 9. | (a)   | $S = \{ (4,7), (9,7), (2,7), (5,7), (4,8), (9,8), (2,8), (5,8), (4,3), (9,3), (2,3), (5,3) \}$ | P2                     | 6 |
|    | (b)i- | $S = \{ (2,7), (5,7), (2,3), (5,3) \}$<br><br>= 4/12 @ 1/3                                     | K1<br><br>N1           |   |
|    | ii-   | $S = \{ (4,7), (4,8), (4,3), (9,7), (9,8), (9,3), (2,8), (5,8) \}$<br><br>= 8/12 @ 2/3         | K1<br><br>N1           |   |

|     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                        |    |   |   |    |    |              |  |
|-----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----|---|---|----|----|--------------|--|
| 10. |     | $\left(\frac{22}{7} \times 6^2 \times t\right) + \left(\frac{1}{2} \times \frac{4}{3} \times \frac{22}{7} \times 6^3\right) = 1584$ $t = 10$                                                                                                                                                                                                                                                                                                                                                                                               | K1 K1 K1<br><br>N1     | 4  |   |   |    |    |              |  |
| 11. | (a) | $\left(\frac{60}{360} \times 2 \times \frac{22}{7} \times 16\right) \text{ ATAU } \left(\frac{90}{360} \times 2 \times \frac{22}{7} \times 10\right)$ $\left(\frac{60}{360} \times 2 \times \frac{22}{7} \times 16\right) + \left(\frac{90}{360} \times 2 \times \frac{22}{7} \times 10\right) + 16 + 10$ $+ 6$ $\frac{1354}{21}$                                                                                                                                                                                                          | K1<br><br>K1<br><br>N1 |    |   |   |    |    |              |  |
|     | (b) | $\left(\frac{60}{360} \times \frac{22}{7} \times 16^2\right) - \left(\frac{90}{360} \times \frac{22}{7} \times 10^2\right)$ $\frac{1166}{21}$                                                                                                                                                                                                                                                                                                                                                                                              | K1K1<br><br>N1         | 6  |   |   |    |    |              |  |
| 12. | (a) | <table border="1"><tr><td>X</td><td>-1</td><td>3</td></tr><tr><td>Y</td><td>12</td><td>-4</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                | X                      | -1 | 3 | Y | 12 | -4 | K1<br><br>K1 |  |
| X   | -1  | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |    |   |   |    |    |              |  |
| Y   | 12  | -4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |    |   |   |    |    |              |  |
|     | (b) | <p>Paksi dilukis dalam arah yang betul dengan skala seragam bagi <math>-3 \leq x \leq 4</math> dan <math>-15 \leq y \leq 25</math>.</p> <p>Kesemua 9 titik dan *2 titiknya diplot dengan betul atau lengkung itu melalui kesemua titik-titik itu bagi <math>-3 \leq x \leq 4</math> dan <math>-15 \leq y \leq 25</math></p> <p>Lengkung yang licin dan berterusan tanpa sebarang garis lurus, melalui kesemua 9 titik yang betul menggunakan skala yang diberi untuk <math>-3 \leq x \leq 4</math> dan <math>-15 \leq y \leq 25</math></p> | P1<br><br>K2<br><br>N1 |    |   |   |    |    |              |  |

|                                |                        | <p>Nota:</p> <p>1. 7 atau 8 titik diplot dengan betul, beri K1.</p> <p>2. Abai lengkung yang terkeluar dari julat skala.</p>                                                                                                                                                                                                                                                                                                                                |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|--------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------|-----------------------------|-------|---|----|-------|---|----|-------|---|----|-------|---|----|-------|---|----|-------|---|----|-------|---|----|----------|--|
|                                | (c) i-                 | $-10 \leq y \leq -9$                                                                                                                                                                                                                                                                                                                                                                                                                                        | P1                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                | ii-                    | $-0.6 \leq x \leq -0.4$                                                                                                                                                                                                                                                                                                                                                                                                                                     | P1                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                | (d)                    | Garis lurus $y = x - 5$ dilukis dengan betul dan tepat.                                                                                                                                                                                                                                                                                                                                                                                                     | K2                             | 12                     |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                |                        | $3.0 \leq x \leq 3.2$                                                                                                                                                                                                                                                                                                                                                                                                                                       | N1                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                |                        | $0.5 \leq x \leq 0.7$                                                                                                                                                                                                                                                                                                                                                                                                                                       | N1                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 13.                            | (a)i-                  | (0, 1)                                                                                                                                                                                                                                                                                                                                                                                                                                                      | P2                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                | ii-                    | (4, 3)                                                                                                                                                                                                                                                                                                                                                                                                                                                      | P1                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                | (b)i-                  | P = Pembesaran, $k = \frac{1}{2}$ , pusat (-6, 0)                                                                                                                                                                                                                                                                                                                                                                                                           | P3                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                | ii-                    | Q = Putaran, $180^\circ$ lawan @ ikut arah jam, pada pusat (-1, -2)                                                                                                                                                                                                                                                                                                                                                                                         | P3                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                | (c)                    | $x = \left(\frac{1}{2}\right)^2 \times (60 + x)$                                                                                                                                                                                                                                                                                                                                                                                                            | K2                             |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                |                        | $x = 20$                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N1                             | 12                     |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
|                                |                        | JKLM = $20 + 60 = 80$                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 14.                            | (a)                    | <table><tr><th>Distance<br/>(km)<br/>Jarak (km)</th><th>Frequency<br/>Kekerapan</th><th>Midpoint<br/>Titik<br/>Tengah</th></tr><tr><td>15-19</td><td>3</td><td>17</td></tr><tr><td>20-24</td><td>5</td><td>22</td></tr><tr><td>25-29</td><td>7</td><td>27</td></tr><tr><td>30-34</td><td>9</td><td>32</td></tr><tr><td>35-39</td><td>7</td><td>37</td></tr><tr><td>40-44</td><td>6</td><td>42</td></tr><tr><td>45-49</td><td>3</td><td>47</td></tr></table> | Distance<br>(km)<br>Jarak (km) | Frequency<br>Kekerapan | Midpoint<br>Titik<br>Tengah | 15-19 | 3 | 17 | 20-24 | 5 | 22 | 25-29 | 7 | 27 | 30-34 | 9 | 32 | 35-39 | 7 | 37 | 40-44 | 6 | 42 | 45-49 | 3 | 47 | K1 K2 K1 |  |
| Distance<br>(km)<br>Jarak (km) | Frequency<br>Kekerapan | Midpoint<br>Titik<br>Tengah                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 15-19                          | 3                      | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 20-24                          | 5                      | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 25-29                          | 7                      | 27                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 30-34                          | 9                      | 32                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 35-39                          | 7                      | 37                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 40-44                          | 6                      | 42                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |
| 45-49                          | 3                      | 47                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                        |                             |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |          |  |

|    |     |                                                                                                                                                                                                                                                                                                                                                    |                        |    |
|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----|
|    | (b) | $\frac{17(3) + 22(5) + 27(7) + 32(9) + 37(7) + 42(6) + 47(3)}{3 + 5 + 7 + 9 + 7 + 6 + 3}$ $= \frac{1290}{40} @ 32.25$ <p>© Note :</p> <p>1. Allow two mistakes in *frequency for K1</p> <p>2. Allow two mistakes for the multiplication of * frequency and midpoint for K1.</p> <p><u>Graph Histogram</u></p>                                      | K2<br>N1               |    |
|    | (c) | <p>Axes drawn in the correct directions with uniform scales for <math>17 \leq x \leq 47</math> and <math>0 \leq y \leq 9</math></p> <p>*7 points plotted correctly using correct values of midpoint .</p> <p>Note : *5 or *6 points plotted correctly, award K1.</p> <p>Smoothness of the graph using the given scales.</p>                        | P1<br><br>K2<br><br>N1 |    |
|    | (d) | Kelas mod 30 - 34                                                                                                                                                                                                                                                                                                                                  | P1                     | 12 |
| 15 | (a) |  <p>Correct shape with rectangle <i>EHGF</i> and <i>IICBG</i>.</p> <p>All solid lines,</p> <p><math>DH = EF &gt; JH</math></p> <p>Measurements correct to <math>\pm 0.2</math> cm (one way) and all angles at vertices = <math>90^\circ \pm 1^\circ</math></p> | K1<br><br>K1<br>N1     |    |

(b)i-



Correct shape with heptagon and quartered  $RHK$ .

All solid lines.

$DE > TV > HJ = JE = RV$

The sector  $RK$  are drawn

Measurements correct to  $\pm 0.2$  cm (one way) and all angles at vertices  $= 90^\circ \pm 1^\circ$

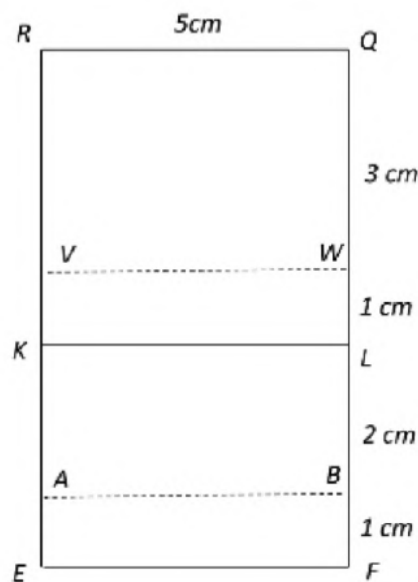
K1

K1

K1

N1

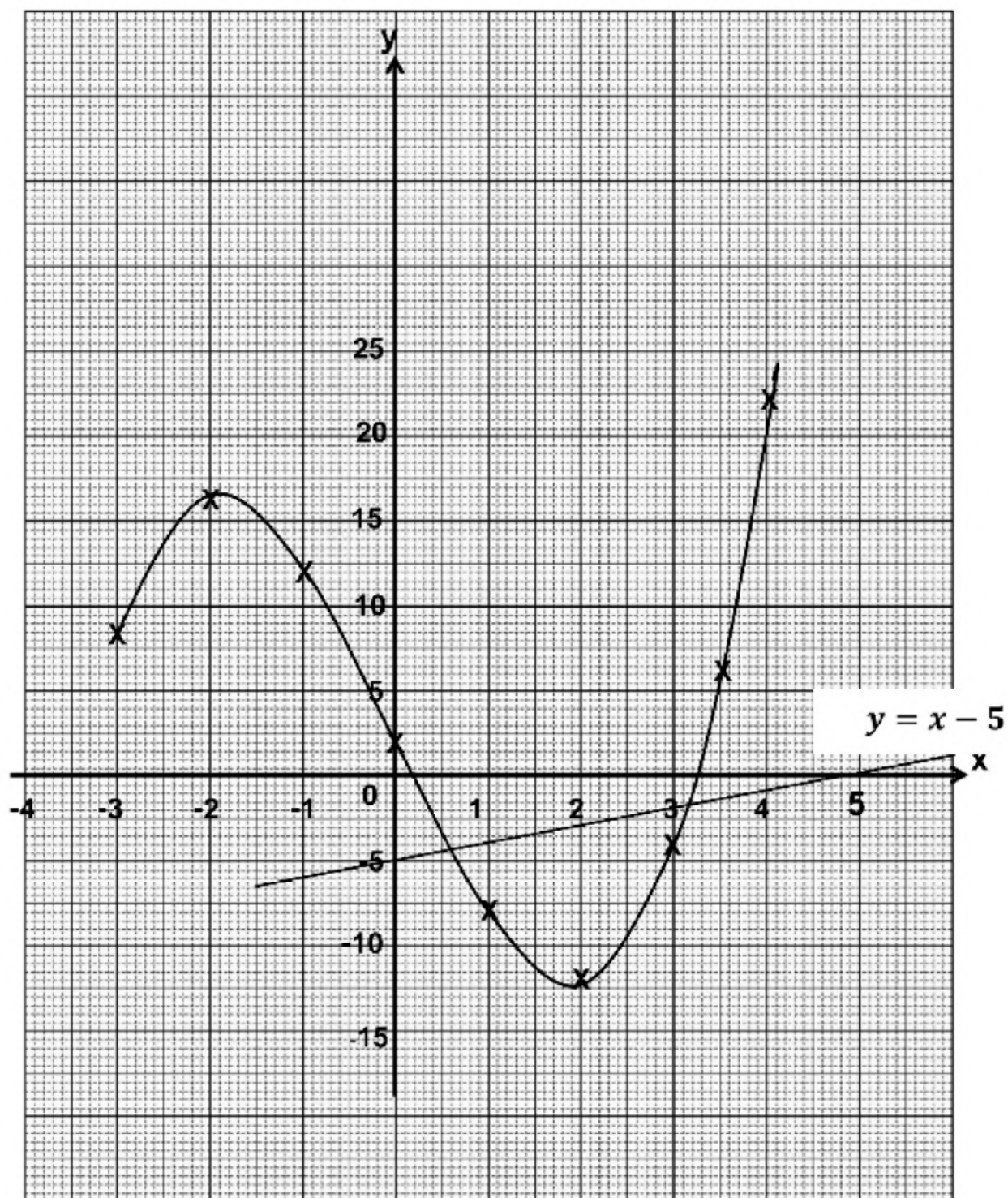
(b) ii-



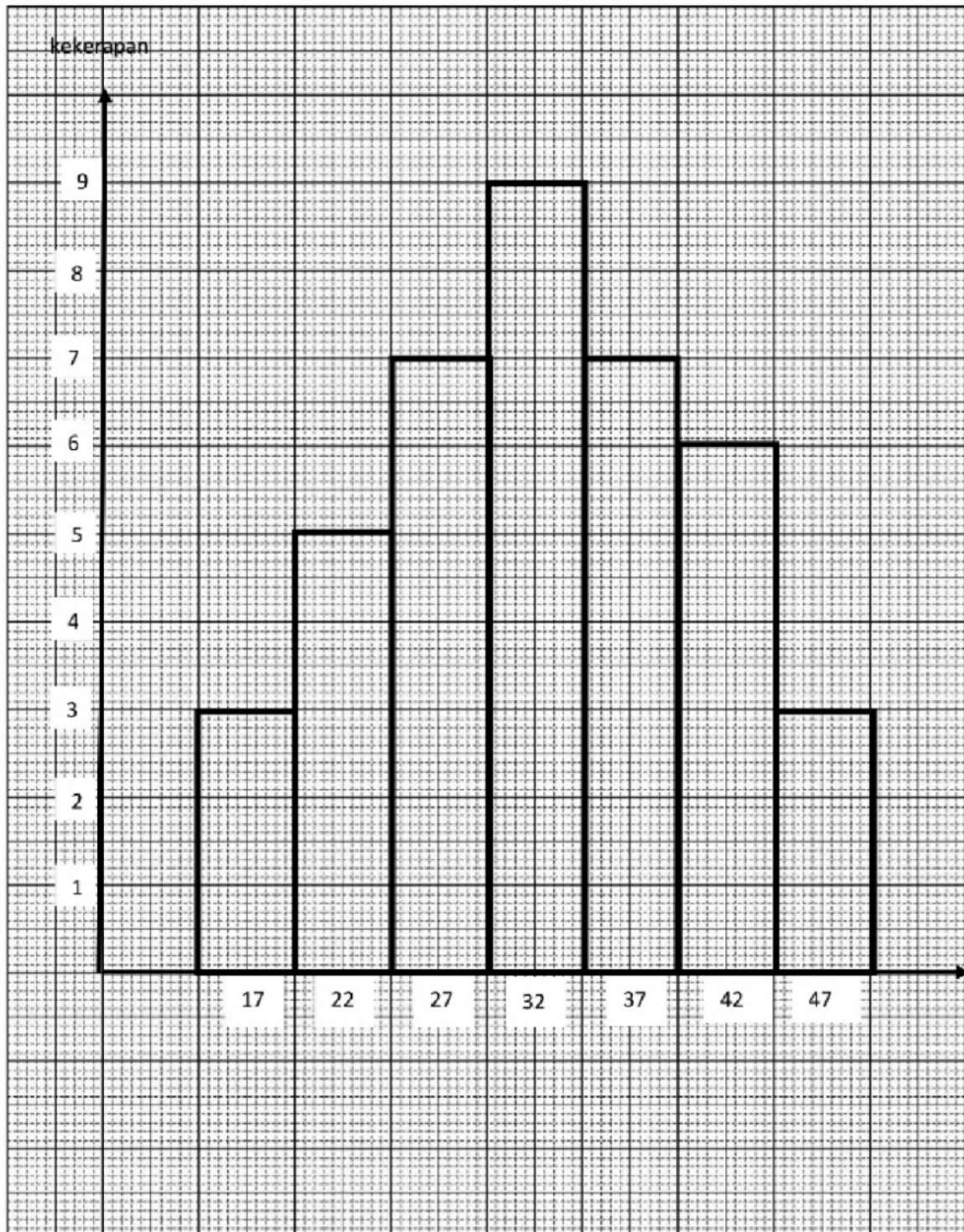
|    |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                   |    |
|----|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|----|
|    |                                                      | <p>Correct shape with rectangle <math>EFQR</math>.</p> <p>All solid lines.</p> <p>(Ignore <math>KI</math>.)</p> <p><math>V - W</math> joined by a dashed line.</p> <p><math>A - B</math> joined by a dashed line.</p> <p><math>RQ &gt; QL &gt; LF &gt; BF = WL</math></p> <p>Measurements correct to <math>\pm 0.2</math> cm (one way) and all angles at vertices = <math>90^\circ \pm 1^\circ</math></p> | <p>K1</p><br><p>K1</p><br><p>K1</p><br><p>K1</p><br><p>N1</p>                                     | 12 |
| 16 | <p>(a)</p><br><p>(b)</p><br><p>(c)</p><br><p>(d)</p> | <p>(<math>45^0\text{U}</math>, <math>120^0\text{B}</math>)</p><br>$\frac{3900}{60}$ <p><math>65 - 45</math></p> <p><math>20^0\text{U}</math></p><br><p><math>(28 + 60) \times 60 \times \cos 45</math></p> <p><math>3733.52 \text{ b.n}</math></p><br>$\frac{(3900 + 3733.52)}{450}$ <p><math>16.96 \text{ jam}</math></p>                                                                                | <p>K1K1K1</p><br><p>K1</p> <p>K1</p> <p>N1</p><br><p>K1K1</p> <p>N1</p><br><p>K1</p><br><p>N1</p> | 12 |



Jawapan 12(b) :



Jawapan 14(c)



# BONUS

(TANPA SKEMA)

**JOHOR**

***KERTAS***

**1**

(BONUS)

Answer all questions.

Jawab semua soalan.

1. Express  $3.15 \times 10^8$  in a single number.

Ungkapkan  $3.15 \times 10^8$  sebagai satu nombor tunggal.

- A 31 500 000 000
- B 3 150 000 000
- C 315 000 000
- D 31 500 000

2.  $4.06 \times 10^5 + 120 \times 10^4 =$

- A  $1.606 \times 10^3$
- B  $1.606 \times 10^4$
- C  $1.606 \times 10^5$
- D  $1.606 \times 10^6$

3. The moon is 405,696 km from the Earth. Express the moon-Earth distance in standard form.

Bulan adalah sejauh 405,696 km daripada Bumi. Ungkapkan jarak bulan-Bumi dalam bentuk piawai.

- A  $4.05 \times 10^5$
- B  $4.06 \times 10^5$
- C  $4.05 \times 10^{-5}$
- D  $4.06 \times 10^{-5}$

4. Table 1 shows the diameters of some of the planets.

Jadual 1 menunjukkan diameter bagi sebilangan planet.

| Name<br>Nama                   | Mercury<br>Utarid | Venus<br>Zuhrah | Earth<br>Bumi | Mars<br>Marikh | Jupiter<br>Musytari |
|--------------------------------|-------------------|-----------------|---------------|----------------|---------------------|
| Diameter (km)<br>Diameter (km) | 4879.4            | 12104           | 12742         | 6779           | 139820              |

Table 1

Jadual 1

Find the diameter difference, in km, between the largest and the smallest planets in Table 1.

Cari beza diameter, dalam km, antara planet terbesar dan terkecil dalam Jadual 1.

- A  $1.330 \times 10^5$
- B  $1.271 \times 10^5$
- C  $1.277 \times 10^5$
- D  $1.349 \times 10^5$

5. Given  $1321_5 = (1 \times p^q) + (3 \times 25) + (2 \times 5) + (1 \times 5^0)$ , state the values of  $p$  and  $q$ .  
 Diberi  $1321_5 = (1 \times p^q) + (3 \times 25) + (2 \times 5) + (1 \times 5^0)$ , nyatakan nilai bagi  $p$  dan  $q$ .

- A  $p = 5, q = 3$   
 B  $p = 3, q = 5$   
 C  $p = 25, q = 3$   
 D  $p = 125, q = 0$

6. State  $147_8$  as a number in base 2.  
 Nyatakan  $147_8$  sebagai satu nombor dalam asas 2.

- A  $1100111_2$   
 B  $1010111_2$   
 C  $1001111_2$   
 D  $1110011_2$

7. In Diagram 1,  $PQRTUW$  is a regular hexagon.  $STUV$  and  $SRQ$  are straight lines.  
 Dalam Rajah 1,  $PQRTUW$  ialah heksagon sekata.  $STUV$  dan  $SRQ$  ialah garis lurus.

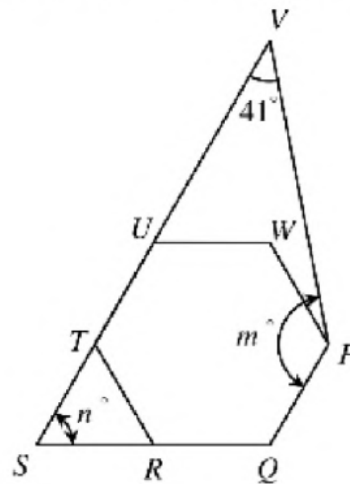


Diagram 1  
 Rajah 1

Calculate the value of  $m + n$ .  
 Hitung nilai bagi  $m + n$ .

- A 140  
 B 169  
 C 199  
 D 219

8. In Diagram 2,  $PQRS$  is a parallelogram.  $UPT$  and  $PRV$  are straight lines.  
*Dalam Rajah 2,  $PQRS$  ialah segi empat selari.  $UPT$  dan  $PRV$  ialah garis lurus.*

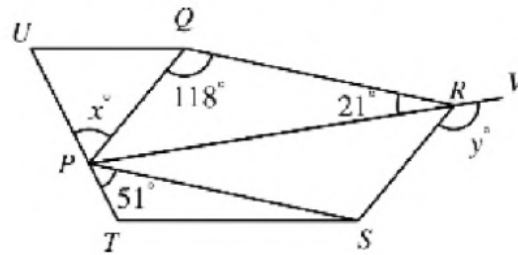


Diagram 2

Rajah 2

Calculate the value of  $y - x$ .

*Hitung nilai bagi  $y - x$ .*

- A 62  
 B 72  
 C 108  
 D 206
9. In Diagram 3,  $O$  is the centre of the circle.  $PQRS$  is a trapezium.  $PNS$ ,  $SMR$ ,  $RLQ$  and  $PKQ$  are tangents to the circle at points  $N$ ,  $M$ ,  $L$  and  $K$  respectively.  
*Dalam Rajah 3,  $O$  ialah pusat bulatan.  $PQRS$  ialah satu trapezium.  $PNS$ ,  $SMR$ ,  $RLQ$  dan  $PKQ$  masing-masing ialah tangen kepada bulatan itu pada titik-titik  $N$ ,  $M$ ,  $L$  dan  $K$ .*

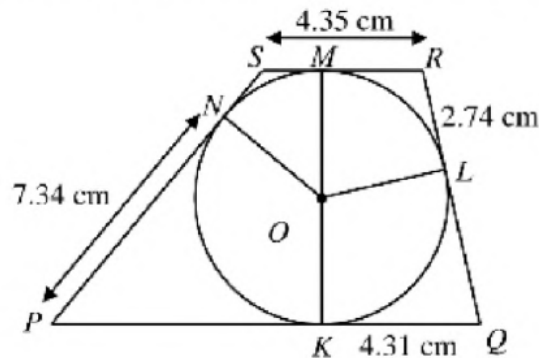


Diagram 3

Rajah 3

Calculate the perimeter, in cm, of the trapezium  $PQRS$ .

*Hitung perimeter, dalam cm, bagi trapezium  $PQRS$ .*

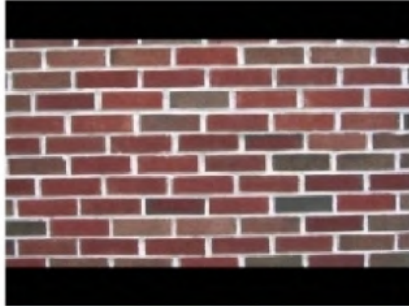
- A 18.74  
 B 32.00  
 C 33.13  
 D 37.48



10. Which of the following real-life situations is **NOT** an example of isometric transformation?

*Antara contoh situasi kehidupan yang berikut, yang manakah **BUKAN** satu penjelmaan isometri?*

A



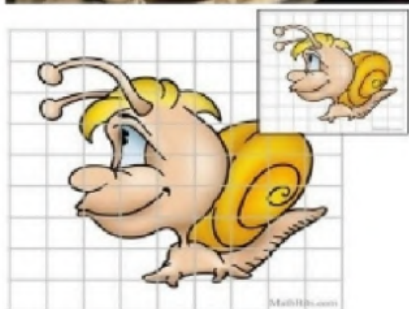
B



C

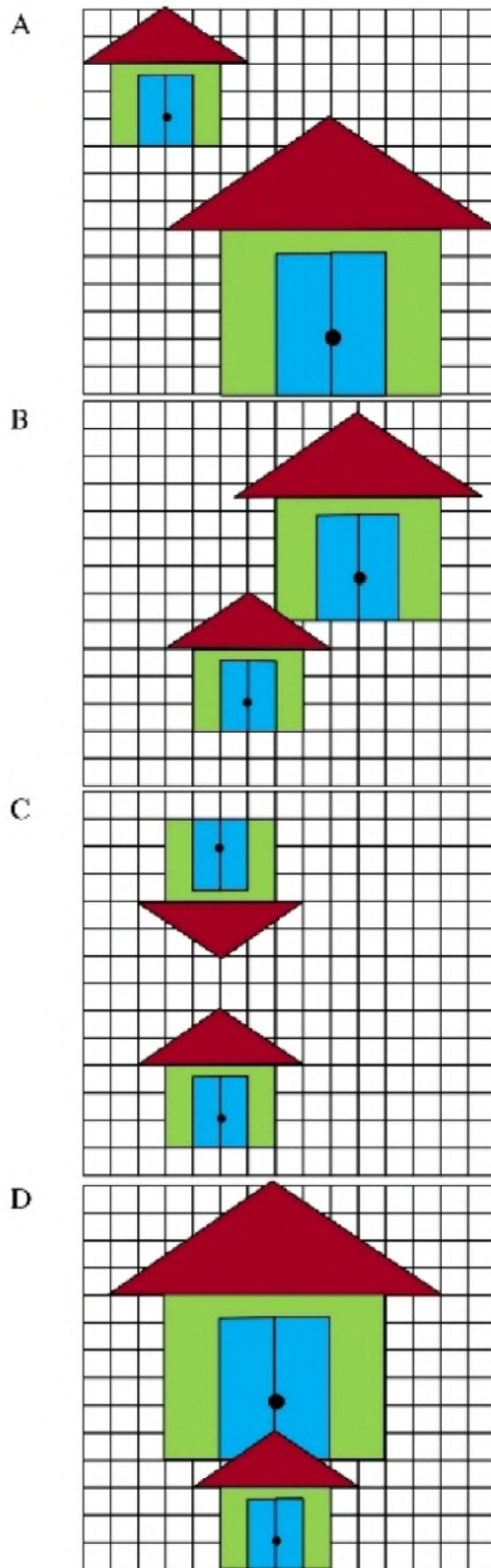


D





11. Which of the following scale factor of enlargements is a negative value?  
*Antara faktor skala pembesaran berikut, yang manakah bernilai negatif?*



12. Diagram 4 shows a sinus graph with  $y = q \sin px^\circ$ ,  $0^\circ \leq x^\circ \leq 360^\circ$ .

Rajah 4 menunjukkan suatu graf sinus dengan  $y = q \sin px^\circ$ ,  $0^\circ \leq x^\circ \leq 360^\circ$ .

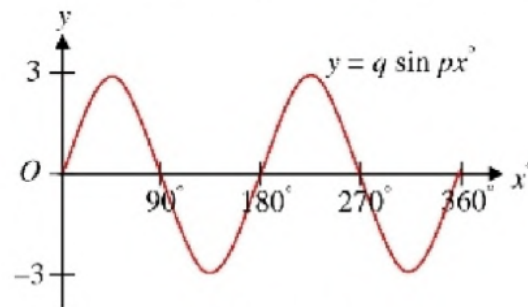


Diagram 4

Rajah 4

Given that  $p$  and  $q$  are constants, find the value of  $p$  and value of  $q$ .

Diberi  $p$  dan  $q$  adalah pemalar, cari nilai  $p$  dan nilai  $q$ .

- A  $p = 2, q = 3$
  - B  $p = -2, q = -3$
  - C  $p = -3, q = -2$
  - D  $p = 3, q = 2$
13. Diagram 5 shows a unit circle.

Rajah 5 menunjukkan satu bulatan unit.

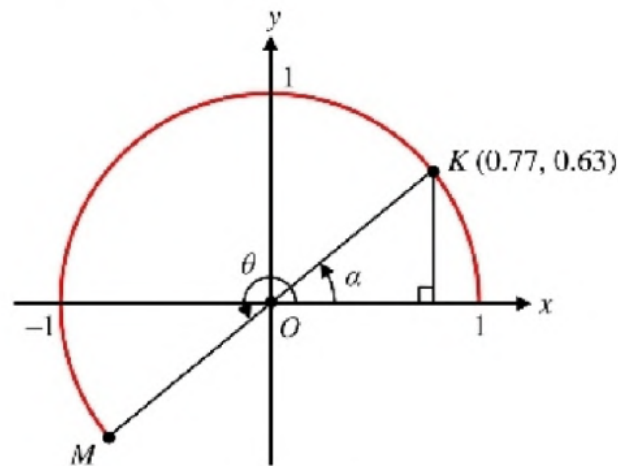


Diagram 5

Rajah 5

Find the value of  $\sin \theta - \cos \theta$

Cari nilai bagi  $\sin \theta - \cos \theta$ .

- A 0.14
- B 1.41
- C -0.14
- D -1.41

14. Diagram 6 shows a basketball player is at the free-throw line, which is 15 feet away from the centre of the basket rim. The basket rim and the eyes of the player are 10 feet and 6 feet above the horizontal floor respectively.

Rajah 6 menunjukkan seorang pemain bola keranjang berada di garisan lemparan bebas yang berjarak 15 kaki dari pusat rim bola. Rim bola dan aras mata pemain itu masing-masing berada setinggi 10 kaki dan 6 kaki di atas tanah mengufuk.

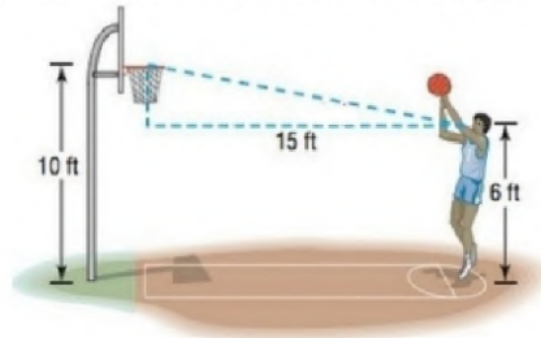


Diagram 6

Rajah 6

Calculate the angle of elevation of the centre of the rim from the player's eyes.

Hitung sudut dongakan pusat rim bola daripada mata pemain bola tersebut.

- A  $14.93^\circ$
- B  $21.80^\circ$
- C  $33.69^\circ$
- D  $75.07^\circ$

15. Diagram 7 shows a wheelchair ramp built for disabled people.

Rajah 7 menunjukkan satu tanjakan kereta roda dibina untuk orang kurang upaya.

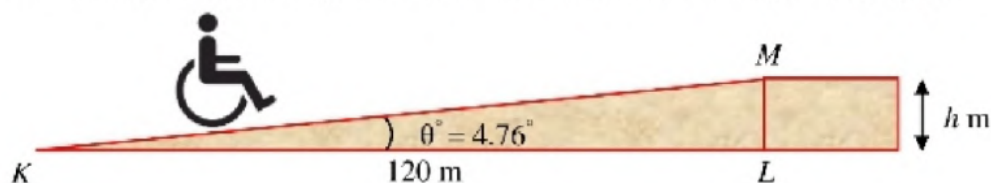


Diagram 7

Rajah 7

A wheelchair ramp is safe to use by disabled people if  $\theta^\circ = 4.76^\circ$ . Ai Ling succeed to do so. Find the vertical height,  $h$ , in m, taken by Ai Ling.

Sebuah tanjakan kereta roda yang selamat untuk kegunaan orang kurang upaya apabila  $\theta^\circ = 4.76^\circ$ . Ai Ling telah berjaya berbuat demikian.

Cari tinggi mencancang,  $h$ , dalam m, yang telah diambil oleh Ai Ling.

- A 0.040
- B 9.958
- C 9.992
- D 119.6

16. Diagram 8 is a net of a solid.

Rajah 8 menunjukkan sebuah bentangan suatu bongkah.

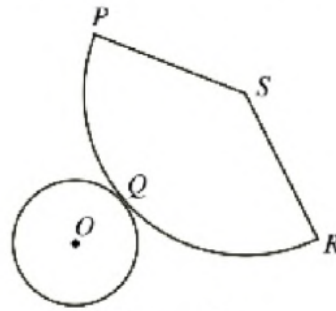


Diagram 8

Rajah 8

Given  $O$  is the centre of the circle and  $S$  is the centre of sector  $SPQR$ . The circle is the base of the solid.

Name the angle between the inclined curve plane and the horizontal plane of the solid.

Diberi  $O$  ialah pusat bulatan dan  $S$  ialah pusat sektor  $SPQR$ . Bulatan itu adalah tapak bongkah itu.

Namakan sudut antara satah melengkung condong dan satah mengufuk bagi bongkah itu.

- A  $\angle RSP$
- B  $\angle QSP$
- C  $\angle SQO$
- D  $\angle QRS$

17. Diagram 9 shows the location of three points at  $G$ ,  $H$  and  $J$ . Point  $G$  lies due north of  $H$ .

Rajah 9 menunjukkan kedudukan tiga titik pada  $G$ ,  $H$  dan  $J$ . Titik  $G$  berada ke utara  $H$ .

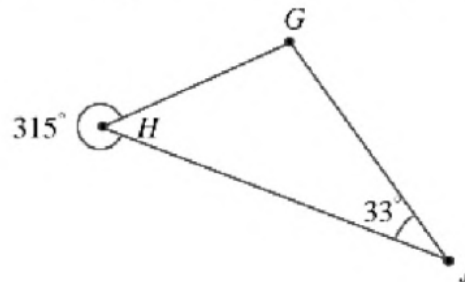


Diagram 9

Rajah 9

Find the bearing of  $G$  from  $J$ .

Cari bearing  $G$  dari  $J$ .

- A  $348^\circ$
- B  $213^\circ$
- C  $258^\circ$
- D  $282^\circ$

18. Diagram 10 shows a Malaysia map with longitudes and latitudes.

*Rajah 10 menunjukkan satu peta Malaysia bersama longitude dan latitude.*



Diagram 10

*Rajah 10*

Based on this Malaysia Map, find the possible location of Kuala Lumpur.

*Berdasarkan peta Malaysia ini, cari lokasi yang mungkin bagi Kuala Lumpur.*

- A (1.49° N, 103.74° E)
- B (3.14° N, 101.69° E)
- C (5.42° N, 100.33° E)
- D (5.98° N, 116.07° E)

19.  $2(x^2 - 9) - (3x + 1)^2 =$

- A  $-7x^2 - 6x - 19$
- B  $-7x^2 + 6x - 17$
- C  $7x^2 - 6x + 17$
- D  $7x^2 + 6x + 19$

20. Express  $\frac{5x}{q+n} \div \frac{nmn+xy}{n^2-q^2}$  as a single fraction in its simplest form.

Ungkapkan  $\frac{5x}{q+n} \div \frac{nmn+xy}{n^2-q^2}$  sebagai satu pecahan tunggal dalam bentuk termudah.

- A  $\frac{5(q-n)}{mn+y}$   
 B  $\frac{5(n-q)}{mn+y}$   
 C  $\frac{5(n-q)}{mn+y}$   
 D  $\frac{5(n-q)}{mn+xy}$

21. Given that  $9r + 2k^2 = 18r$ , express  $k$  in terms of  $r$ .

Diberi bahawa  $9r + 2k^2 = 18r$ , ungkapkan  $k$  dalam sebutan  $r$ .

- A  $3\sqrt{\frac{r}{2}}$   
 B  $3\sqrt{\frac{r}{2}}$   
 C  $9\sqrt{\frac{r}{2}}$   
 D  $\frac{9\sqrt{r}}{2}$

22. Simplify :

Permudahkan :

$$\frac{p^4 \times (16p^8)^{\frac{1}{2}}}{q^{-3}}$$

- A  $2p^3q^{-3}$   
 B  $2p^6q^3$   
 C  $4p^3q^{-3}$   
 D  $16p^6q^3$

23. Find the value of :

Cari nilai bagi :

$$\left(1\frac{2}{3} \times 3\frac{6}{7}\right)^{-1}$$

- A  $\frac{45}{7}$   
 B  $\frac{7}{45}$   
 C  $4\frac{5}{7}$   
 D  $7\frac{4}{5}$



24. Diagram 11 shows a logo formed by 5 identical regular pentagons with side 7 cm.

*Rajah 11 menunjukkan satu logo yang terbentuk daripada 5 pentagon sekata serupa yang bersisi 7 cm.*



Diagram 11

*Rajah 11*

Calculate the perimeter, in cm, of the logo.

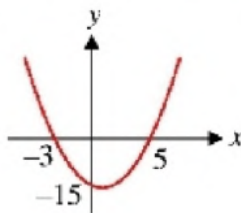
*Hitung perimeter, dalam cm, bagi logo itu.*

- A 175
- B 147
- C 125
- D 119

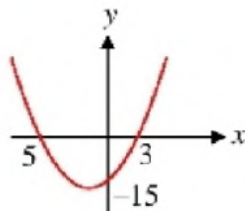
25. Which of the following graphs represents  $y = (x + 5)(x - 3)$ ?

*Antara graf berikut, yang manakah mewakili  $y = (x + 5)(x - 3)$ ?*

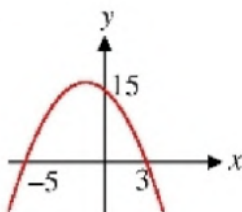
A



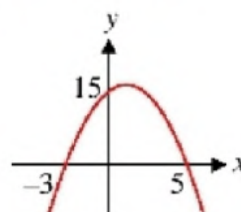
B



C



D



26. Diagram 12 shows a number line.

*Rajah 12 menunjukkan satu garis lurus.*

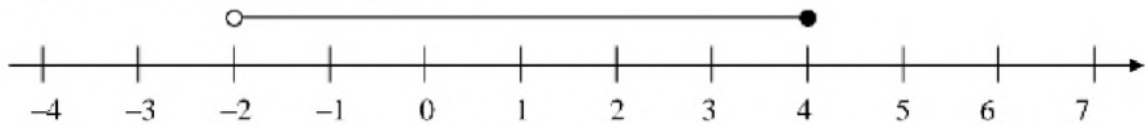


Diagram 12

*Rajah 12*

Which of the following simultaneous inequalities is the solution of the number line?

*Antara ketaksamaan serentak berikut, yang manakah ialah penyelesaian bagi garis nombor itu?*

- A  $-2 < 4x + 6$  and/ dan  $3x < -x + 16$   
 B  $-2 \leq 4x + 6$  and/ dan  $3x < -x + 16$   
 C  $2 < 4x + 6$  and/ dan  $3x \leq -x + 16$   
 D  $-2 \leq 4x + 6$  and/ dan  $3x \leq -x + 16$
27.  $3x - 2 < 8$  and  $5 < y \leq 12$  are two simultaneous linear inequalities where  $x$  and  $y$  are integers. Find the maximum value of  $y - x$ .  
 *$3x - 2 < 8$  dan  $5 < y \leq 12$  adalah dua ketaksamaan linear serentak di mana  $x$  dan  $y$  ialah integer. Cari nilai maksimum bagi  $y - x$ .*

- A 5  
 B 7  
 C 9  
 D 15

28. Table 2 shows a cumulative frequency table for the T-shirt sizes of the students in a class.  
*Jadual 2 menunjukkan jadual kekerapan longgokan bagi saiz kemeja-T murid-murid dalam suatu kelas.*

| T-shirt Size<br>Saiz Kemeja-T               | S | M  | L  | XL | XXL |
|---------------------------------------------|---|----|----|----|-----|
| Cumulative Frequency<br>Kekerapan longgokan | 2 | 18 | 28 | 33 | 36  |

Table 2

*Jadual 2*

A number of T-shirts of new students are added to the data. The new mode of T-shirt size is L. Determine the minimum number of the new students.

*Sebilangan saiz kemeja-T murid baharu ditambah ke dalam data. Mod baharu saiz kemeja-T ialah L. Tentukan bilangan minimum murid baharu itu.*

- A 5  
 B 6  
 C 7  
 D 8



29. Table 3 shows the results of a competition.

*Jadual 3 menunjukkan keputusan bagi suatu pertandingan.*

| Score<br>Skor                                       | 0   | 1  | 2  | 3  | 4   |
|-----------------------------------------------------|-----|----|----|----|-----|
| Frequency $\times$ score<br>Kekerapan $\times$ skor | $m$ | 15 | 24 | 36 | $n$ |

Table 3

*Jadual 3*

55 participants already took part in that competition, find the values of  $m$  and  $n$ .

*55 peserta sudah mengambil bahagian dalam pertandingan itu, cari nilai bagi  $m$  dan  $n$ .*

- A  $m = 64, n = 0$   
 B  $m = 16, n = 4$   
 C  $m = 4, n = 16$   
 D  $m = 0, n = 64$

30. Diagram 13 is a pie chart of the distribution of Adam's income in March.

*Rajah 13 ialah satu carta pai yang menunjukkan agihan pendapatan Adam pada bulan Mac.*

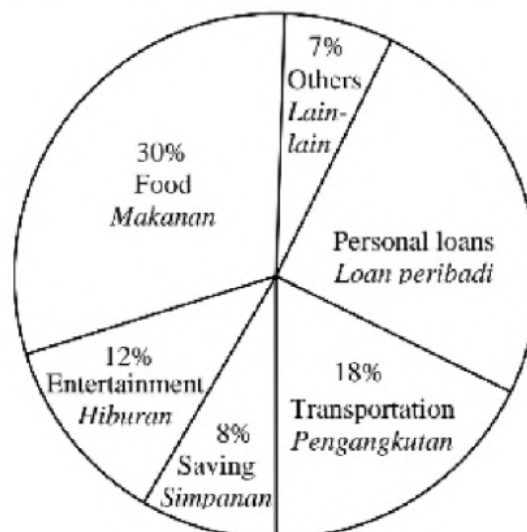


Diagram 13

*Rajah 13*

In April, Adam wants to increase 5% from his income as saving by reducing his expenses on entertainment.

Calculate Adam's expenses on entertainment in April, in RM, if his total income is RM3500.

*Pada bulan April, Adam ingin menambah 5% daripada pendapatannya sebagai simpanan dengan mengurangkan perbelanjaan pada hiburan.*

*Hitung perbelanjaan Adam pada hiburan bagi bulan April, dalam RM, jika pendapatannya ialah RM3500.*

- A 245  
 B 420  
 C 455  
 D 1050

31. Diagram 14 shows an ogive of a group of students' weight.

*Rajah 14 menunjukkan satu ogif bagi berat sekumpulan murid.*

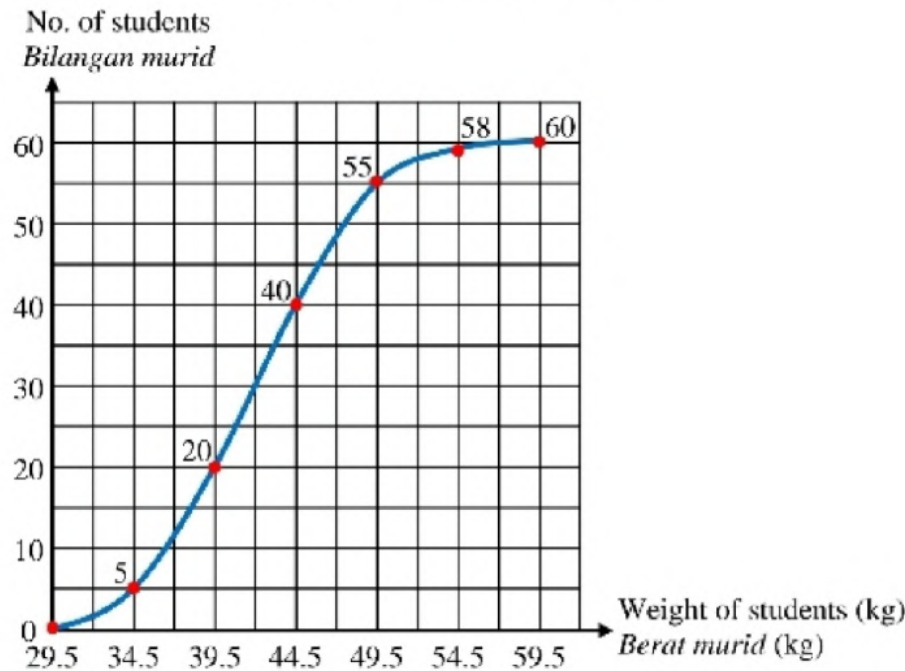


Diagram 14

*Rajah 14*

Which of the following is **false** ?

*Antara berikut, yang manakah adalah **palsu** ?*

- A** Estimated median weight of the students is 42 kg.  
*Anggaran median berat kumpulan murid ini adalah 42 kg.*
- B** Modal class of this grouped data is 40 – 44 kg.  
*Kelas mod bagi data terkumpul ini adalah 40 – 44 kg.*
- C** Number of students in this group is 238  
*Bilangan murid bagi kumpulan ini ialah 238.*
- D** Number of students whose weight more than 44.5 kg is 20 students.  
*Bilangan murid yang melebihi 44.5 kg ialah seramai 20 murid.*
32. Given that  $\xi = \{x: 77 < x < 86\}$ ,  $P = \{x: x \text{ is a multiple of } 4\}$ ,  
 $Q = \{x: x \text{ is a whole number such that when divided by } 5, \text{ the remainder is } 2\}$ .  
State the elements of  $(P \cup Q)'$ .  
*Diberi bahawa  $\xi = \{x: 77 < x < 86\}$ ,  $P = \{x: x \text{ ialah gandaan } 4\}$ ,  
 $Q = \{x: x \text{ ialah nombor bulat dengan keadaan apabila dibahagi } 5, \text{ bakinya ialah } 2\}$ .  
Nyatakan unsure bagi  $(P \cup Q)'$ .*

- A**  $\{77, 80, 82, 84, 86\}$
- B**  $\{78, 79, 81, 83, 85\}$
- C**  $\{80, 82, 84\}$
- D**  $\{78, 79, 81\}$

33. Diagram 15 is a Venn diagram with the universal set  $\xi$ , set  $M$ , set  $C$  and set  $B$ .

Rajah 15 ialah gambar rajah Venn dengan set semesta  $\xi$ , set  $M$ , set  $C$  dan set  $B$ .

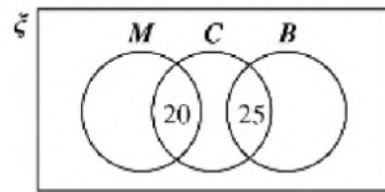


Diagram 15

Rajah 15

$M = \{\text{Mathematics Club Member}\}$ ,  $C = \{\text{Chess Club Member}\}$ ,

$B = \{\text{Basketball Club Member}\}$ .

$M = \{\text{Ahli Kelab Matematik}\}$ ,  $C = \{\text{Ahli Kelab Catur}\}$ ,

$B = \{\text{Ahli Kelab Bola Keranjang}\}$ .

Given  $n(\xi) = 215$ ,  $n(M) = 85$ ,  $n(C) = 70$ ,  $n(B) = 60$  and  $n(M \cap C) = 20$ .

Diberi  $n(\xi) = 215$ ,  $n(M) = 85$ ,  $n(C) = 70$ ,  $n(B) = 60$  dan  $n(M \cap C) = 20$ .

Find the difference between the number of students who are not involved in any of the club and the number of Mathematics Club's member only.

Cari beza antara bilangan murid yang tidak terlibat dalam mana-mana kelab dengan bilangan murid ahli Kelab Matematik sahaja.

- A 45
- B 65
- C 100
- D 110

34. Diagram 16 shows a straight line which intercepts the  $x$ -axis and  $y$ -axis on a Cartesian plane.

Rajah 16 menunjukkan suatu garis lurus yang memotong paksi- $x$  dan paksi- $y$  pada suatu satah Cartes.

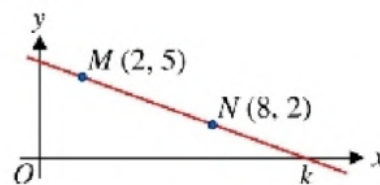


Diagram 16

Rajah 16

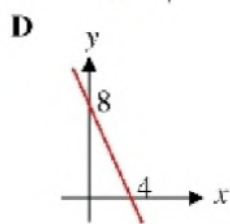
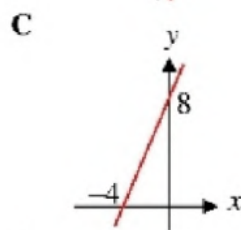
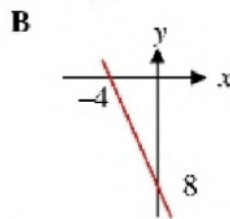
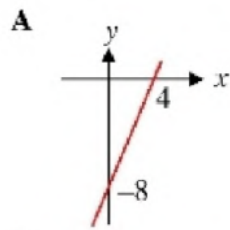
Find the value of  $k$ .

Cari nilai bagi  $k$ .

- A 10
- B 12
- C 14
- D 16

35. Which of the following graph is parallel to  $y = 2x - 8$ ?

*Antara graf berikut, yang manakah mewakili  $y = 2x - 8$ ?*



36. Table 4 shows the number of students who attend a Mathematics Programme.

*Jadual 4 menunjukkan bilangan murid yang menghadiri satu Program Matematik.*

| <b>Class/ Kelas</b><br><b>Gender/ Jantina</b> | 5T1 | 5T2 | 5T3 |
|-----------------------------------------------|-----|-----|-----|
| <b>Lelaki/ Boys</b>                           | 12  | 14  | 11  |
| <b>Girl/ Perempuan</b>                        | 10  | 9   | 13  |

Table 4

*Jadual 4*

A student is selected at random from the programme.

Find the probability that a girl from 5T2 is selected.

*Seorang murid dipilih secara rawak daripada program tersebut.*

*Cari kebarangkalian bahawa seorang murid perempuan dari 5T2 dipilih.*

- A**  $\frac{3}{23}$   
**B**  $\frac{9}{23}$   
**C**  $\frac{10}{69}$   
**D**  $\frac{13}{69}$

37. A box contains 48 cups. There are blue cups and white cups. A cup is chosen at random from the box. The probability that a blue cup is chosen is  $\frac{1}{6}$ . How many blue cups need to be added to the box so that the probability that a blue cup is chosen is  $\frac{1}{2}$ ?

*Sebuah kotak mengandungi 48 cawan yang terdiri daripada cawan biru dan cawan putih. Sebiji cawan dipilih secara rawak dari kotak itu. Kebarangkalian sebiji cawan biru dipilih ialah  $\frac{1}{6}$ . Berapakah bilangan cawan biru yang perlu ditambah ke dalam kotak itu supaya kebarangkalian sebiji cawan biru dipilih ialah  $\frac{1}{2}$ ?*

- A** 8  
**B** 16  
**C** 24  
**D** 32

38. The relation between  $p$ ,  $n$  and  $r$  is  $p \propto \frac{\sqrt[3]{n}}{r}$ . Given that  $p = 4$  when  $n = 8$  and  $r = 6$ , calculate the value of  $p$  when  $n = 64$  and  $r = 3$ .

*Hubungan antara  $p$ ,  $n$  dan  $r$  ialah  $p \propto \frac{\sqrt[3]{n}}{r}$ . Diberi bahawa  $p = 4$  apabila  $n = 8$  dan  $r = 6$ , hitung nilai  $p$  apabila  $n = 64$  dan  $r = 3$ .*

- A** 48
- B** 32
- C** 24
- D** 16

39. If the rate of interest is fixed, the amount of interest earned varies directly as the amount of principal invested and the duration the principal is invested.

Given that the interest earned from a year's investment of RM5000 is RM150.

Calculate the amount of principal, in RM, is needed to earn an interest of RM100 in 4 months at the same rate.

*Jika kadar faedah ditetapkan, jumlah faedah diperolehi berkadar langsung dengan jumlah wang pokok dilaburkan dan tempoh wang pokok itu dilaburkan.*

*Diberi faedah diperolehi dari pelaburan setahun sebanyak RM5000 adalah RM150.*

*Hitung jumlah wang pokok, dalam RM, diperlukan untuk memperoleh faedah RM100 dalam 4 bulan pada kadar yang sama.*

- A** 1500000
- B** 1000000
- C** 15000
- D** 10000

40. Find the value of  $h$  and of  $k$  in the following matrix equation:

*Cari nilai  $h$  dan nilai  $k$  bagi persamaan matrik berikut :*

$$\begin{pmatrix} h & 10 \\ 5 & 1 \end{pmatrix} - 2 \begin{pmatrix} 4 & 5 \\ 0 & -1 \end{pmatrix} = \begin{pmatrix} -12 & 0 \\ 5 & k \end{pmatrix}$$

- A**  $h = -1, k = 1$
- B**  $h = -3, k = 2$
- C**  $h = -4, k = 3$
- D**  $h = -8, k = 0$

**QUESTION PAPER END**  
**KERTAS SOALAN TAMAT**

**JOHOR**

***KERTAS***

**2**

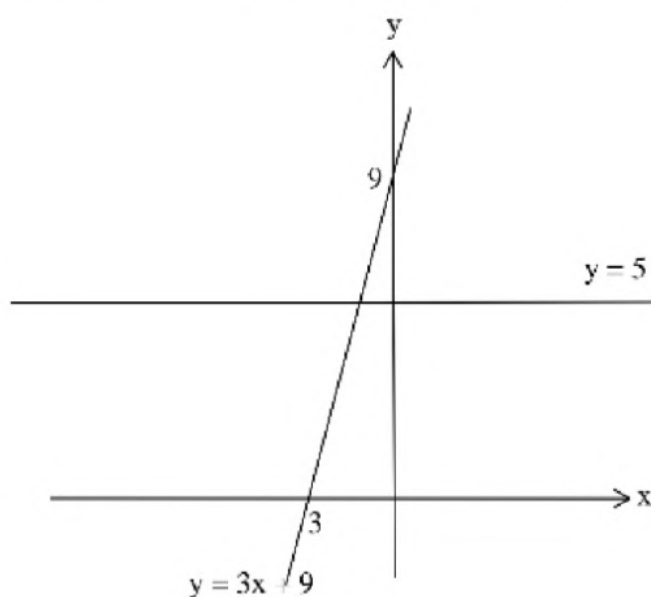
(BONUS)

**Section A**  
**Bahagian A**  
 [52 marks]  
 [52 markah]

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

1. Diagram 1 shows the graph of  $y = 3x + 9$ ,  $y = -x$  and  $y \leq 5$ .

Rajah 1 menunjukkan graf bagi  $y = 3x + 9$ ,  $y = -x$  dan  $y \leq 5$ .



**Diagram 1/ Rajah 1**

Shade the region that satisfies  $y \leq 3x + 9$ ,  $y > -x$  and  $y \leq 5$ .

Lorekkan kawasan yang memuaskan  $y \leq 3x + 9$ ,  $y > -x$  dan  $y \leq 5$ .

[3 marks]

[3 markah]



2. A motorboat heads upstream a distance of 24 miles on the Kankakee River whose current is running 3 miles per hour. The trip up and back takes 6 hours. Assuming that the motorboat maintained a constant speed relative to the water, and using the equation

$$\frac{24}{x-3} + \frac{24}{x+3} = 6, \text{ what was its speed?}$$

*Sebuah bot motor menuju hulu Sungai Kankakee sejauh 24 batu yang arusnya berjalan 3 batu sejam. Perjalanan pergi dan balik bot motor mengambil masa 6 jam. Dengan andaian bahawa bot motor mengekalkan kelajuan tetap berbanding air menggunakan persamaan*

$$\frac{24}{x-3} + \frac{24}{x+3} = 6, \text{ apakah kelajuan bot itu?}$$

[4 marks]

[4 markah]

Answer / Jawapan :

**SULIT**

3. Solution by matrix method is **not** allowed to answer this question.

*Penyelesaian dengan kaedah matriks **tidak** dibenarkan untuk menjawab soalan ini.*

Diagram 2 shows a car and a 6-seater van.

*Rajah 2 menunjukkan sebuah kereta dan sebuah van 6 tempat duduk.*



Diagram 2 / Rajah 2

A group of 88 flood victims is evacuated using car and van. Only 4 people are allowed on board in the car and 6 people are on board in the van. In each ride, there are 3 bags in the car and 12 bags in the vans.

By neglecting the drivers in your calculation, calculate the number of cars and vans if there are 126 bags is carried by the victim.

*Sekumpulan 88 orang mangsa banjir dipindahkan menggunakan kereta dan van.*

*Hanya 4 orang mangsa dibenarkan menaiki kereta dan 6 orang mangsa dibenarkan menaiki van. Dalam setiap kali perjalanan, kereta itu membawa 3 buah beg dan van itu membawa 12 buah beg.*

*Dengan mengabaikan bilangan pemandu kereta dan van dalam pengiraan anda, hitung bilangan kereta dan bilangan van jika terdapat 126 beg telah dibawa oleh mangsa.*

[4 marks]

[4 markah]

Answer / Jawaban:

## SULIT

Untuk  
Kegunaan  
Pemeriksaan

4. Anna and two of her children have drawn a potrait. They put the potrait in the box as shown in Diagram 3 to send to her friend in Johor Bahru. Given height of the box is 40 cm.

*Anna dan dua orang anaknya telah melukis sebuah potret. Mereka meletakkan potret itu di dalam sebuah kotak, seperti yg ditunjukkan dalam Rajah 3 untuk dikirimkan kepada sahabat yang berada di Johor Bahru. Diberi tinggi kotak itu ialah 40 cm.*

- (a) On the diagram in the answer space, mark the angle between the potrait and the base of the box.

*Pada rajah di ruang jawapan, tandakan sudut di antara potret itu dengan tapak kotak.*

- (b) Hence, calculate the angle between the potrait and the base of the box.

*Seterusnya, hitung sudut di antara potret dengan tapak kotak.*

[3 marks]

[3 markah]

Answer /Jawapan:

(a)

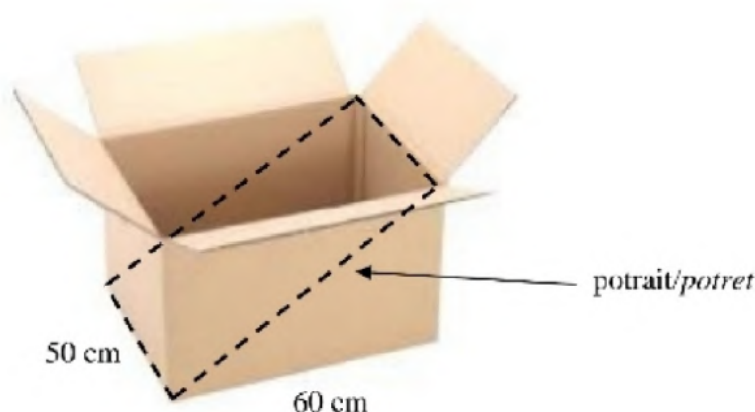


Diagram 3 / Rajah 3

(b)

5. Diagram 4 show a right conical container filled with liquid.

Rajah 4 menunjukkan sebuah bekas berbentuk kon tegak yang mengandungi cecair.

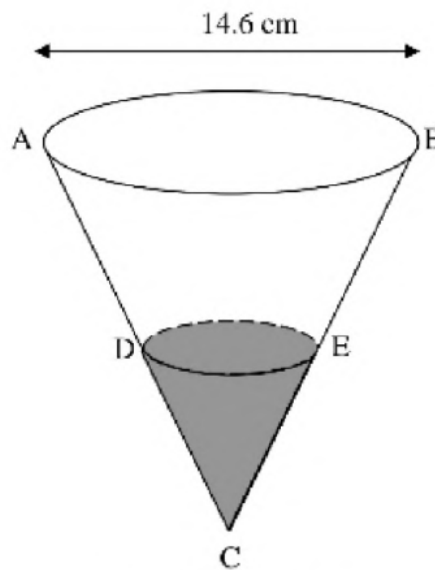


Diagram 4/ Rajah 4

The volume of the liquid is  $308 \text{ cm}^3$ . The diameter of the surface of the liquid, DE, is 7 cm.

Using  $\pi = \frac{22}{7}$ , find the height, in cm, liquid of the container.

Isipadu bagi cecair ialah  $308 \text{ cm}^3$ . Diameter bagi permukaan cecair, DE, ialah 7 cm. Dengan menggunakan  $\pi = \frac{22}{7}$ , cari ketinggian, dalam cm, cecair di dalam bekas itu.

[4 marks]

[4 markah]

Answer / Jawapan:

**SULIT**

6. Diagram 5 shows three straight lines AB, CD and AD which are drawn on a Cartesian plane. AB is parallel to CD and AD is parallel to the y-axis.

*Rajah 5 menunjukkan tiga garis lurus AB, CD dan AD yang dilukis pada satah Cartesan. AB adalah selari dengan CD dan AD adalah selari dengan paksi-y.*

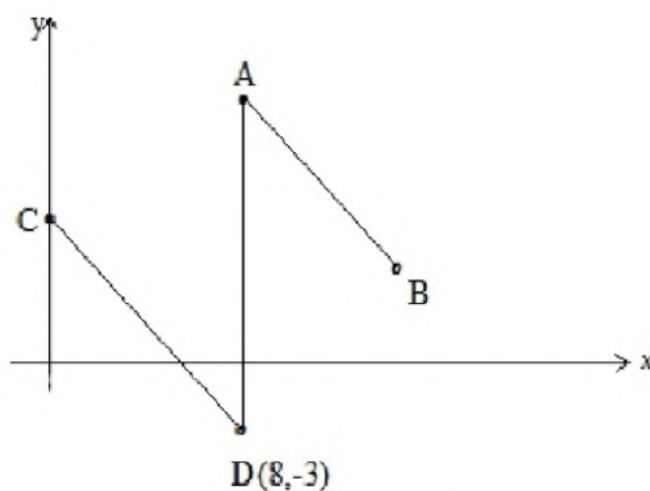


Diagram 5/ Rajah 5

It is given that  $CD = AD = 17$  units. Find

*Diberi bahawa  $CD = AD = 17$  unit. Cari*

- (a) the coordinates of point A,  
*koordinat bagi titik A,*
- (b) the gradient of CD,  
*kecerunan garis lurus CD,*
- (c) the equation of the straight line AB  
*persamaan garis lurus AB*

[5 marks]

[5 markah]

*Answer / Jawapan:*

(a)

(b)

(c)

**SULIT**

- 7(a)(i) Write a compound statement by combining the two statements given below using the word 'or'.

*Tulis satu pernyataan majmuk dengan menggabungkan dua pernyataan diberi di bawah dengan menggunakan perkataan 'atau'.*

27 is an integer / 27 ialah integer  
27 is a prime number / 27 ialah nombor perdana

- (ii) State whether the compound statement written in 7(a)(i) is true or false.

*Nyatakan sama ada pernyataan majmuk di 7(a)(i) ialah benar atau palsu.*

- (b) Write down premis 2 to complete the following argument.

*Tulis premis 2 untuk melengkapkan hujah berikut.*

Premis 1: If  $v = \frac{1}{3}\pi j^2(9)$  is the volume of the cone, then  $j$  is the radius of the circle.

*Premis 1: Jika  $v = \frac{1}{3}\pi j^2(9)$  ialah isipadu bagi kon, maka  $j$  ialah jejari bagi bulatan.*

Premis 2: .....

Conclusion: 7 is the radius of the circle.

*Kesimpulan: 7 ialah jejari bagi bulatan.*

- (c) Write a conclusion by deduction for the following statement.

*Tulis satu kesimpulan secara deduksi bagi pernyataan yang berikut.*

It is given that the total surface area of a cube is  $6x^2$  where  $x$  is the length of each side.

Make a conclusion by deduction for the total surface area of the cube with  $x = 4$  cm.

*Diberi bahawa jumlah luas permukaan bagi sebuah kubus ialah  $6x^2$  dengan keadaan  $x$  ialah panjang setiap sisi. Buat satu kesimpulan secara deduksi untuk jumlah luas permukaan kubus tersebut dengan  $x = 4$  cm.*

[5 marks]

[5 markah]

Answer/Jawapan:

(a)(i) .....

(ii) .....

(b) Premis 2: .....

(c) .....



8a)

Given  $m \begin{pmatrix} -6 & n \\ 5 & -2 \end{pmatrix} \begin{pmatrix} 2 & 4 \\ -5 & -6 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ , find the value of  $m$  and of  $n$ .

Diberi  $m \begin{pmatrix} -6 & n \\ 5 & -2 \end{pmatrix} \begin{pmatrix} 2 & 4 \\ -5 & -6 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ , cari nilai  $m$  dan  $n$ .

b) Write the following simultaneous linear equations as matrix equation:

*Tulis persamaan linear serentak berikut dalam bentuk persamaan matriks:*

$$2x + 4y = -6$$

$$-5x - 6y = 3$$

Hence, using matrix method, calculate the value of  $x$  and  $y$ .

*Seterusnya, dengan menggunakan kaedah matriks, hitung nilai  $x$  dan  $y$ .*

[6 marks]

[ 6 markah]

Answer/Jawapan:

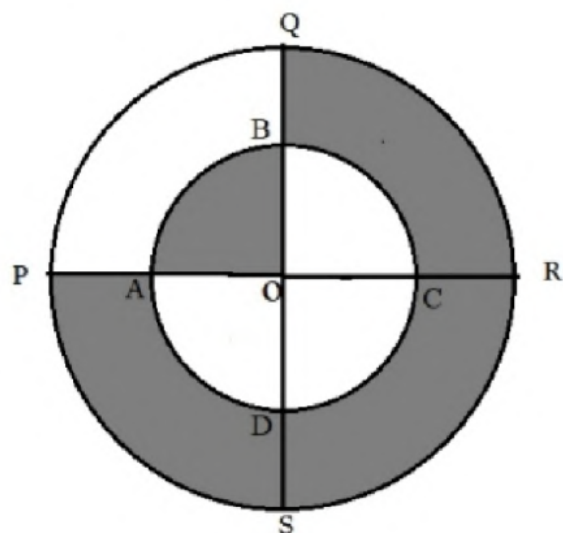
(a)

(b)

**SULIT**

9. Diagram 6 shows circle  $ABCD$  and  $PQRS$  with centre  $O$ .

*Rajah 6 menunjukkan bulatan  $ABCD$  dan  $PQRS$  yang berpusat di  $O$ .*



**Diagram 6/ Rajah 6**

It is given that  $OA = 14$  cm and  $PA = AO$

*Diberi  $OA = 14$  cm dan  $PA = AO$*

Using  $\pi = \frac{22}{7}$ , calculate

*Dengan menggunakan  $\pi = \frac{22}{7}$ , hitung*

- (a) the perimeter, in cm, of the shaded region,  
*perimeter, dalam cm, kawasan yang berlorek,*
- (b) the area, in  $\text{cm}^2$ , of the shaded region.  
*luas, dalam  $\text{cm}^2$ , kawasan yang berlorek.*

[6 marks]

[6 markah]

Answer/Jawapan:

a)

b)

**SULIT**

- 10 Diagram 7 shows five cards labelled with letters that are put into box.

*Rajah 7 menunjukkan lima keping kad huruf yang dimasukkan ke dalam sebuah kotak.*

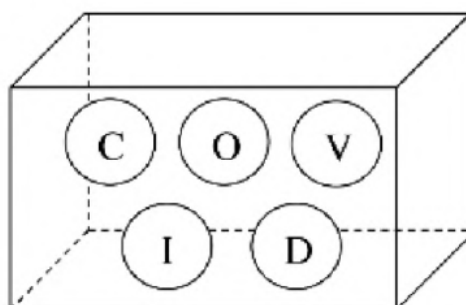


Diagram 7/Rajah 7

Two cards are chosen at random from the box one by one with replacement.

*Dua keping kad dipilih secara rawak dari kotak itu satu demi satu dengan pengembalian.*

- (a) Complete the sample space in Table 1 in the answer space.  
*Lengkapkan ruang sampel dalam Jadual 10 di ruang jawapan.*
- (b) By listing all the possible outcomes of the events, calculate the probability that  
*Dengan menyenaraikan semua kesudahan yang mungkin bagi peristiwa itu, hitung kebarangkalian bahawa*
- (i) the two-card chosen have the same letter.  
*dua keping kad yang dipilih itu mempunyai huruf yang sama.*
- (ii) the first card is a card with a vowel or the second card is a card with consonant.  
*kad pertama ialah kad berhuruf vokal atau kad kedua ialah kad konsonan.*

[6 marks]

[6 markah]

Answer/Jawapan:

(a)

| First Card /<br><i>Kad Pertama</i> | Second card / <i>Kad Kedua</i> |        |        |        |        |
|------------------------------------|--------------------------------|--------|--------|--------|--------|
|                                    | C                              | O      | V      | I      | D      |
| C                                  | (C, C)                         | (C, O) |        | (C, I) |        |
| O                                  | (O, C)                         |        |        | (O, I) | (O, D) |
| V                                  | (V, C)                         |        | (V, V) |        | (V, D) |
| I                                  |                                | (I, O) | (I, V) | (I, I) |        |
| D                                  | (D, C)                         | (D, O) |        | (D, I) |        |

Table 1 / *Jadual 1*

(b) (i)

(ii)

**SULIT**

11. Diagram 8 shows the speed-time graph of a lorry during a period of 20 second.  
*Rajah 8 menunjukkan graf laju-masa bagi sebuah lori dalam tempoh 20 saat.*

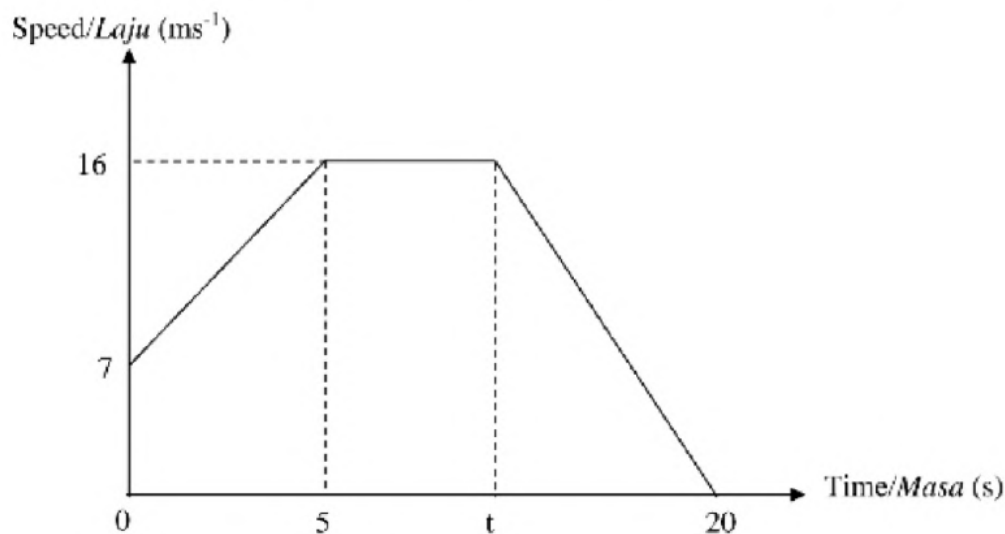


Diagram 8/Rajah 8

- (a) State the uniform speed, in  $\text{ms}^{-1}$ , of the lorry.  
*Nyatakan laju seragam, dalam  $\text{ms}^{-1}$ , lori tersebut.*
- (b) Calculate the rate of change of speed, in  $\text{ms}^{-2}$ , in the first 5 seconds.  
*Hitung kadar perubahan laju, in  $\text{ms}^{-2}$ , dalam 5 saat pertama.*
- (c) Calculate the value of t, if the distanced travelled in the last 15 seconds is 160m.  
*Hitung nilai t, jika jarak yang dilalui dalam 15 saat terakhir ialah 160m.*

[6 marks]

[6 markah]

Answer/Jawapan :

- (a)
- (b)
- (c)

Section B / Bahagian B

[48 marks/markah]

Answer any **four** questions from this section.

Jawab mana-mana **empat** soalan daripada bahagian ini.

12.

- (a) Complete Table 12 in the answer space for the equation  $y = x^3 - 10x + 4$

Lengkapkan Jadual 12 di ruang jawapan bagi persamaan  $y = x^3 - 10x + 4$

[2 marks /2 markah]

- (b) For this part of the question, use the graph paper provided. You may use a flexible curve rule.

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan. Anda boleh menggunakan pembaris fleksibel.

By 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  $y = x^3 - 10x + 4$  for  $-3.5 \leq x \leq 4$ .

Dengan menggunakan skala 2 cm kepada 1 unit pada paksi-x dan 2 cm kepada 2 unit pada paksi-y, lukiskan graf  $y = x^3 - 10x + 4$  bagi  $-3.5 \leq x \leq 4$ .

[4 marks /4 markah]

- c) From your graph, find

Daripada graf anda, carikan

- (i) the value of y when  $x = 1.5$

nilai y apabila  $x = 1.5$ ,

- (ii) the value of x when  $y = 17$ .

nilai x apabila  $y = 17$ .

[2 marks /2 markah]

- (d) Draw a suitable straight line on your graph to find the values of x which satisfies

the equation  $x^3 = 12x - 5$  for  $-3.5 \leq x \leq 4$ . State these values of x.

Lukiskan satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai x yang memuaskan persamaan  $x^3 = 12x - 5$  bagi  $-3.5 \leq x \leq 4$ . Nyatakan nilai-nilai x itu.

[4 marks /4 markah]

**SULIT***Answer/ Jawapan:*

(a)

|     |      |    |    |    |   |   |    |      |    |
|-----|------|----|----|----|---|---|----|------|----|
| $x$ | -3.5 | -3 | -2 | -1 | 0 | 1 | 2  | 3.5  | 4  |
| $y$ | -3.9 |    | 16 | 13 | 4 |   | -8 | 11.9 | 28 |

**TABLE 2 (JADUAL 2)**

(b) *Rujuk graf.*  
*Refer graph.*

(c) (i)  $y = \dots\dots\dots$

(ii)  $x = \dots\dots\dots$

(d)  $x = \dots\dots\dots, \dots\dots\dots$



13. (a) Transformation **Q** is a reflection in the line  $y = x$ .

Transformation **T** is a translation  $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$

*Penjelmaan **Q** mewakili satu pantulan pada garis lurus  $y = x$ .*

*Penjelmaan **T** mewakili satu translasi  $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$*

State the coordinates of the image of the point  $(-2, 6)$  under each of the following transformations :

*Nyatakan koordinat imej bagi titik  $(-2, 6)$  di bawah setiap penjelmaan berikut:*

(i) **T**

(ii) **Q T**.

[ 3 marks]

[3 markah ]

- (b) Diagram 9 shows three polygon,  $ABCDE$ ,  $JKLMN$  and  $PQRST$  drawn on a Cartesian plane.

*Rajah 9 menunjukkan tiga buah poligon  $ABCDE$ ,  $JKLMN$  dan  $PQRST$ , dilukis pada satah Cartesian.*

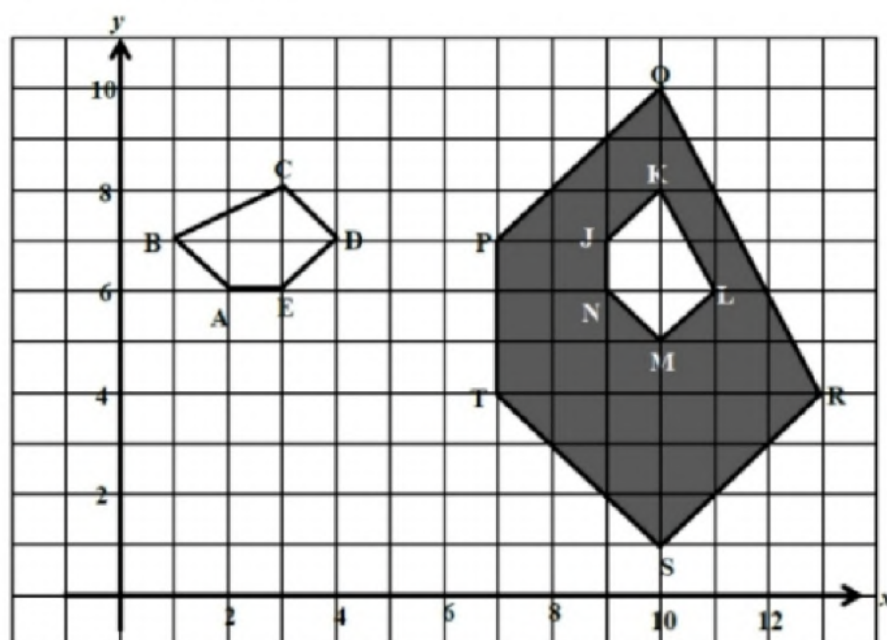


Diagram 9 / Rajah 9

- (i)  $JKLMN$  is the image of  $ABCDE$  under the transformation  $M$  and  $PQRST$  is the image of  $JKLMN$  under the transformation  $N$ .

*$JKLMN$  ialah imej bagi  $ABCDE$  di bawah penjelmaan  $M$  dan  $PQRST$  ialah imej bagi  $JKLMN$  di bawah penjelmaan  $N$ .*

Describe in full the transformation :

*Huraikan selengkapnya penjelmaan :*

- (a)  $M$ ,  
(b)  $N$

- (ii) If the area of polygon  $ABCDE$  is  $16 \text{ m}^2$ , calculate the area of the shaded region.

*Jika luas poligon  $ABCDE$  ialah  $16 \text{ m}^2$ , hitungkan luas kawasan bertorek.*

[ 9 marks ]

[9 markah ]

Answer / Jawapan:

(a) (i)

(ii)

(b) (i) (a) **M:**

(b) **N:**

(ii)

**SULIT**

14. Diagram 10 below shows marks obtained by Form 5 students in a Mathematics quiz.  
*Rajah 10 di bawah menunjukkan markah yang diperolehi oleh pelajar Tingkatan 5 dalam satu kuiz Matematik.*

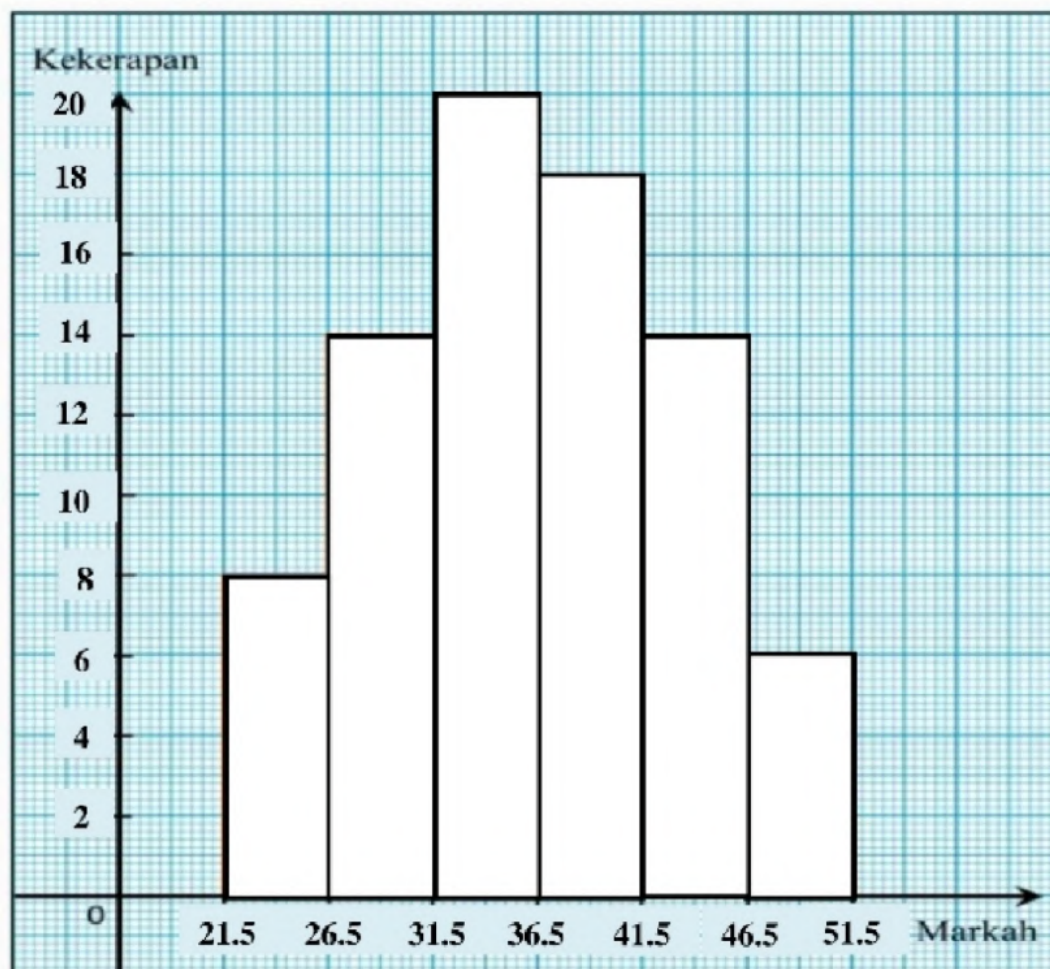


Diagram 10 / Rajah 10

- (a) Based on the diagram 3 above, complete Table 3 in the answer space.  
*Berdasarkan Rajah 10 di atas, lengkapkan jadual 3 di ruang jawapan.*  
[4 marks/4markah]
- (b) Calculate the estimated mean for the marks obtained by a student.  
*Hitung min anggaran markah bagi seorang murid.*  
[3 marks/3markah]
- (c) Using a scale of 2 cm to 5 marks on the horizontal axis and 2 cm to 10 students on the vertical axis, draw an ogive for the data.  
*Dengan menggunakan skala 2 cm kepada 5 markah kepada paksi mengufuk dan 2 cm kepada 10 murid pada paksi mencancang, lukiskan satu ogif bagi data itu.*  
[4 marks/4 markah]

- (d) Using the ogive drawn, state the percentage of the student who received reward if the qualified marks are 40.

*Berdasarkan ogif yang dilukis, nyatakan peratus murid yang menerima ganjaran jika markah yang layak ialah 40.*

[1 marks/markah]

Answer/Jawapan :

(a)

| <b>Class Interval</b><br><i>Selang kelas</i> | <b>Cumulative Frequency</b><br><i>Kekerapan Longgokan</i> | <b>Upper Boundary</b><br><i>Sempadan Atas</i> | <b>Midpoint</b><br><i>Titik Tengah</i> |
|----------------------------------------------|-----------------------------------------------------------|-----------------------------------------------|----------------------------------------|
|                                              | 8                                                         |                                               |                                        |
|                                              |                                                           |                                               |                                        |
| 32 - 36                                      |                                                           |                                               | 34                                     |
|                                              |                                                           |                                               |                                        |
|                                              |                                                           |                                               |                                        |
| 47 - 51                                      |                                                           |                                               |                                        |

Table 3 /Jadual 3

(b)

(c) Refer graph / Rujuk graf

(d)

# SULIT

Untuk  
Kegunaan  
Pemeriksaan

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

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

- (a) Diagram 11.1 shows a solid right prism ABFGLH and cuboid BCDEKHJ. The triangle ABF is the uniform cross section of the prism. BEF and CD are vertical edges and  $EF=KL=2\text{ cm}$ .

Rajah 11.1 menunjukkan sebuah pepejal yang terdiri daripada gabungan prisma tegak ABFGLH dan kuboid BCDEKHJ. Segitiga bersudut tegak ABF ialah keratan rentas seragam prisma itu. Tepi BEF dan CD adalah tegak dan  $EF=KL=2\text{ cm}$ .

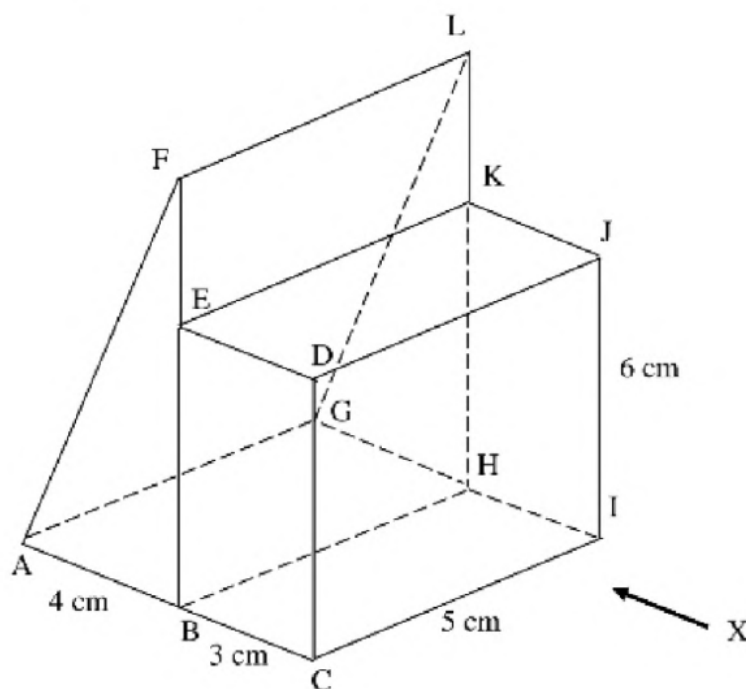


Diagram 11.1/ Rajah 11.1

Draw to full scale, the elevation of the vertical plane parallel to CI as viewed from X.

Lukiskan dengan skala penuh, dongakan pepejal itu pada satah mencancang yang selari dengan CI sebagaimana dilihat dari arah X.

[3 marks/3markah]

Answer/Jawapan :

- (b) A cube of 3 cm is removed from the cuboid in diagram 11.1. The composite solid is shown in Diagram 11.2.

*Sebuah kubus bertepi 3 cm dipotong dan dikeluarkan daripada kuboid pada rajah 11.1.*

*Pepejal yang tinggal adalah seperti dalam Rajah 11.2.*

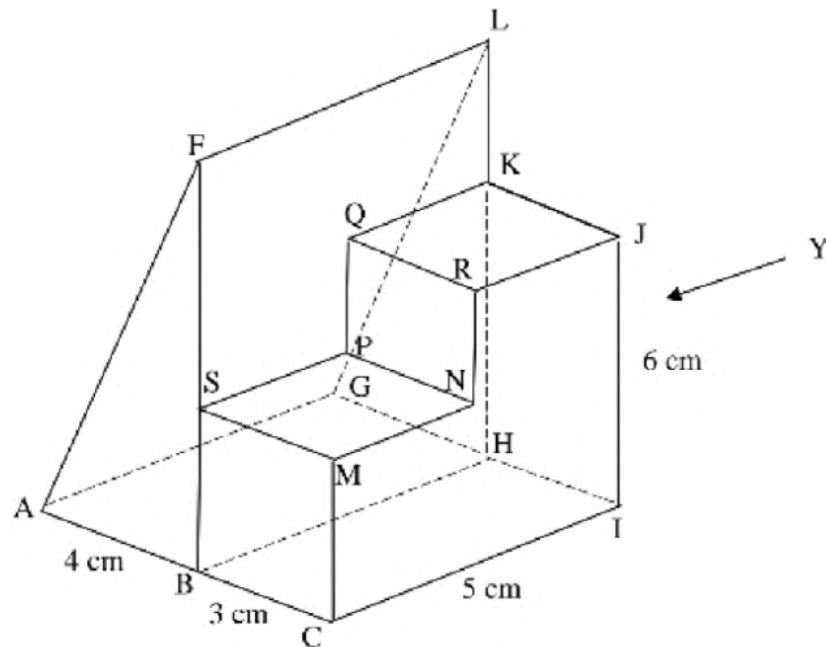


Diagram 11.2/Rajah 11.2

Draw to full scale,  
*Lukiskan dengan skala penuh,*

- (i) the plan of the solid  
*pelan pepejal itu.*

[4 marks/4 markah]

- (ii) the elevation of the composite solid on a vertical plane parallel to GHI as viewed from Y.

*Dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan GHI  
sebagaimana dilihat dari Y.*

[5 marks/5 markah]

**SULIT**

Answer:

*Jawapan:*

(b) (i), (ii)

Untuk  
Kegunaan  
Pemeriksa



16.  $P(55^\circ \text{ S}, 115^\circ \text{ W})$ ,  $Q(55^\circ \text{ S}, 55^\circ \text{ W})$ ,  $R$  and  $S$  are four points on the surface of the earth.  $PR$  is a diameter of a parallel of latitude  $55^\circ \text{ S}$ .

$P(55^\circ \text{ S}, 115^\circ \text{ B})$ ,  $Q(55^\circ \text{ S}, 55^\circ \text{ B})$ ,  $R$  dan  $S$  ialah empat titik pada permukaan bumi.  $PR$  ialah diameter selarian latitud  $55^\circ \text{ S}$ .

(a) State the longitude of  $R$ .

*Nyatakan longitud bagi  $R$ .*

[2 marks/2 markah]

(b) Calculate the distance, in nautical mile, from  $Q$  due east to  $R$  measured along the common parallel of latitude.

*Hitung jarak, dalam batu nautika, dari  $Q$  arah ke timur  $R$  diukur sepanjang selarian latitud sepunya.*

[3 marks/3markah]

(c) Calculate the shortest distance in nautical mile, from  $P$  due east to  $R$  measured along the surface of the earth.

*Hitung jarak terpendek dalam batu nautika, dari  $P$  ke  $R$  yang diukur sepanjang permukaan bumi.*

[3 marks/3markah]

d) Point  $S$  is 5100 nautical miles due north of  $R$ . An aeroplane took off from  $Q$  and flew due east to  $R$  along the common parallel of latitude. Then it flew due north to  $S$ . The average speed for the whole flight was 855 knots.

*Titik  $S$  ialah 5100 batu nautika arah utara dari  $R$ . Sebuah kapal terbang berlepas dari  $Q$  dan terbang arah timur ke  $R$  sepanjang selarian latitude sepunya. Kemudian terbang arah utara ke  $S$ . Purata laju bagi keseluruhan penerbangan itu ialah 855 knot.*

Calculate,

*Hitung,*

i) The latitude of  $S$

*Latitud  $S$*

ii) the total time, in hours, taken for the whole flight.

*jumlah masa, dalam jam, yang diambil bagi keseluruhan penerbangan itu.*

[4 marks/4markah]

**SULIT**

*Answer/Jawapan:*

(a)

(b)

(c)

(d)

*Untuk  
Kegunaan  
Pemeriksa*

**QUESTION PAPER END  
KERTAS SOALAN TAMAT**

**JOHOR**

***KERTAS***

**2**

(BONUS 2)

**Section A**  
**Bahagian A**  
[52 marks]  
[52 markah]

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

1. State all the three inequalities that represent the shaded region in Diagram 1.  
Nyatakan tiga ketaksamaan yang mewakili kawasan berlorek dalam Rajah 1.

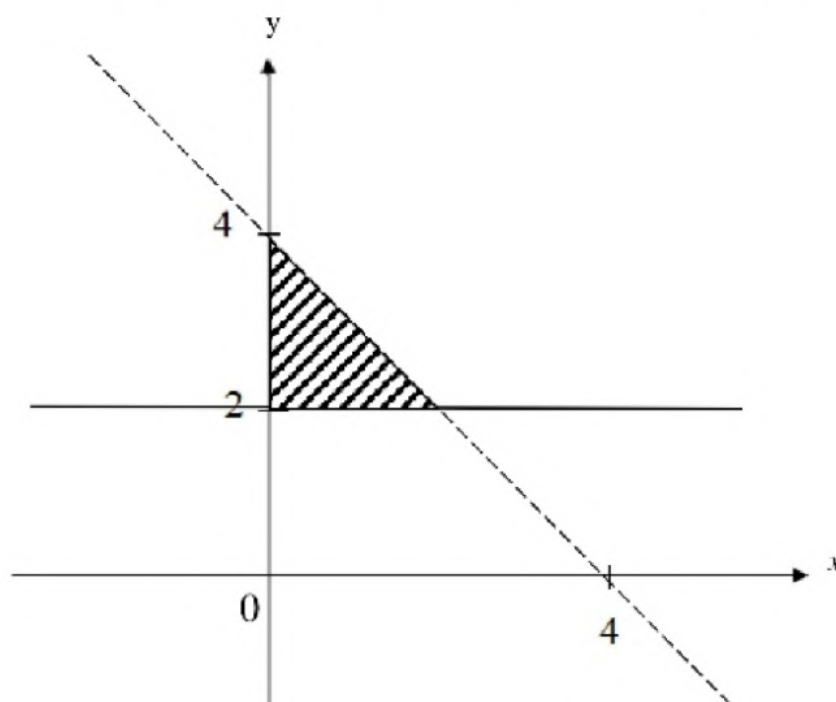


Diagram 1/ Rajah 1

[3 marks]  
[3 markah]

Answer/Jawapan:

- (i)  
  
(ii)  
  
(iii)

2. During the CMCO holidays, Rina plans to create a herbal garden at her lawn. RUVW is the plan for her house lawn. The herbal garden is RST and triangle shaped. Her entire lawn is  $20 \text{ m}^2$ . Find the length and width in m for her house lawn.

*Sempena cuti PKPB, Rina ingin membuat sebuah taman herba di laman rumahnya. RUVW ialah pelan laman rumahnya. Laman herba RST berbentuk segitiga. Diberi luas seluruh ruangan laman rumahnya ialah  $20 \text{ m}^2$ . Cari panjang dan lebar, dalam m, seluruh laman rumahnya.*

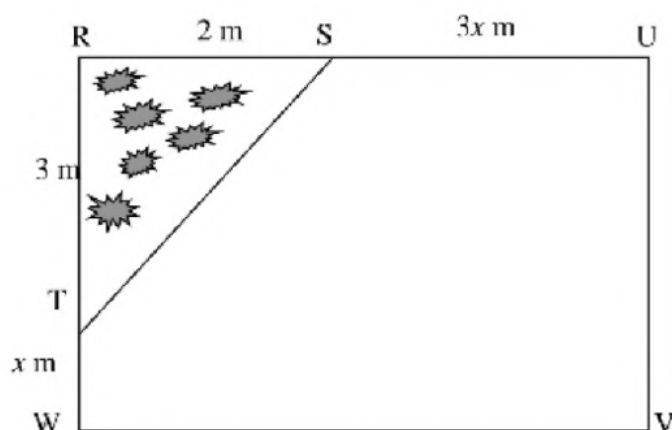


Diagram 2 / Rajah 2

[4 marks]

[4 markah]

Answer / Jawapan:

**SULIT**

Untuk  
Kegunaan  
Pemeriksa

3. Solution by matrix method is **not** allowed to answer this question.

*Penyelesaian dengan kaedah matriks **tidak** dibenarkan untuk menjawab soalan ini.*

Zaida has  $P$  coins and Wan has  $Q$  coins. If Zaida gives 20 coins to Wan then both of them have the same number of coins. If Wan gives 50 coins to Zaida, then the ratio of Zaida's coin to Wan's coin is 3:2. Find the number of coin  $P$  and coin  $Q$ .

*Zaida mempunyai  $P$  keping duit syiling dan Wan mempunyai  $Q$  keping duit syiling. Jika Zaida telah memberikan 20 keping duit syiling kepada Wan, maka, bilangan duit syiling mereka menjadi sama banyak. Jika Wan memberikan 50 keping duit syiling kepada Zaida, maka, mereka dapati nisbah duit syiling Zaida kepada Wan adalah 3:2. Cari bilangan keping syiling  $P$  dan syiling  $Q$ .*

[4 marks]

[4 markah]

Answer/Jawapan:

4. Diagram 3 shows a right prism with a horizontal square base PQRS. Trapezium PQUT is the uniform cross-section of the prism. The rectangular surface QRVU is inclined.

Rajah 3 menunjukkan sebuah prisma tegak dengan tapak segiempat sama mengufuk PQRS. Trapezium PQUT ialah keratan rentas seragam prisma itu. Permukaan segiempat tepat QRVU adalah condong.

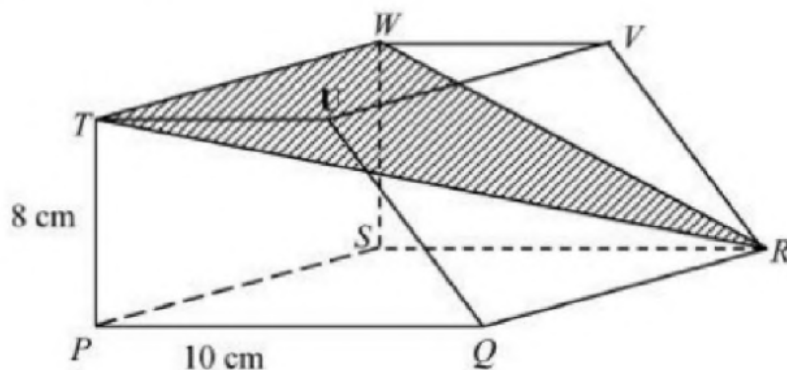


Diagram 3 / Rajah 3

- (a) Name the angle between the plane TRW and the vertical plane PSWT.  
*Namakan sudut diantara satah TRW dengan satah mencancang PSWT.*
- (b) Calculate the angle between the plane TRW and the vertical plane PSWT.  
*Hitung sudut diantara satah TRW dengan satah mencancang PSWT.*

[3 marks]  
[3 markah]

Answer/Jawapan:

(a)

(b)

**SULIT**

Untuk  
Kegunaan  
Pemeriksa

5. Given the equation of the straight line is  $5x - 3y + 15 = 0$ . Answer below question  
*Diberi persamaan bagi satu garis lurus adalah  $5x - 3y + 15 = 0$ . Jawab soalan dibawah.*

(a) State the gradient.

*Nyatakan kecerunan.*

(b) Find the y- intercept.

*Cari pintasan-y.*

(c) Find the equation of straight line passes through the points  $(-3, 9)$  where the line is parallel to the straight line  $5x - 3y + 15 = 0$ .

*Cari persamaan garis lurus yang melalui titik  $(-3, 9)$  di mana keadaan garis lurus itu adalah selari dengan garis lurus  $5x - 3y + 15 = 0$ .*

[5 marks]

[5 markah]

Answer / Jawapan :

(a)

(b)

(c)



6.

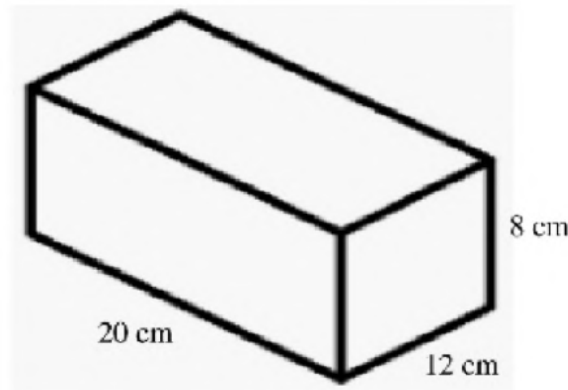


Diagram 4/ Rajah 4

An ice making company produces ice cube using a cuboid container as shown in Diagram 4. A cylinder shaped container containing boiled water is transferred to each cuboid container. Each worker is responsible for transferring water with one cylinder container for half an hour into the cuboid container. The cylinder container is 54 cm high and the diameter of the cylinder is 30 cm. Calculate the number of ice that can be produced with the volume of water in one cylinder. Round off the answer to 2 significant figures.

*Sebuah syarikat pembuatan ais menghasilkan kiub ais menggunakan bekas berbentuk kuboid seperti Rajah 4. Satu bekas silinder air yang telah dimasak dipindahkan di setiap bekas kuboid. Setiap seorang pekerja bertanggungjawab memindahkan air dengan satu bekas silinder dalam masa setengah jam ke dalam setiap bekas kuboid. Ukuran bekas silinder air dengan ketinggian 54 cm dan diameter bekas silinder ialah 30 cm. Hitungkan bilangan ais yang dapat dihasilkan dengan isipadu air dalam satu silinder. Bundarkan jawapan kepada 2 angka bererti.*

(Use / Guna  $\pi = \frac{22}{7}$ )

[4 marks]

[4 markah]

Answer / Jawapan:

**SULIT**

- 7(a) Complete the following sentences with the symbols ' $=$ ' or ' $\neq$ ' in the answer space the box provided to form a

*Lengkapkan ayat-ayat berikut dengan simbol ' $=$ ' atau ' $\neq$ ' di ruang jawapan di dalam kotak yang disediakan untuk membentuk*

- (i) true statement / pernyataan benar
- (ii) false statement / pernyataan palsu
- (b) State the converse of the following statement. Hence determine whether the converse is true or false.

*Nyatakan akas bagi pernyataan berikut. Seterusnya tentukan sama ada akas itu benar atau palsu.*

*If  $k < -2$ , then  $k^2 > 4$  / Jika  $k < -2$ , maka  $k^2 > 4$*

- (c) Make a general conclusion by induction for the following pattern  
*Buat satu kesimpulan umum secara aruhan bagi pola berikut:*

$$\begin{aligned} -\frac{1}{2} &= \frac{1}{2} - 1 \\ -\frac{3}{4} &= \frac{1}{4} - 1 \\ -\frac{7}{8} &= \frac{1}{8} - 1 \\ \dots &= \dots \end{aligned}$$

[6 marks]  
[6 markah]

Answer / Jawapan:

(a) (i)  $4 - 6$    $2$

(ii)  $\frac{1}{2} + \frac{1}{3}$    $\frac{6}{5}$

(b) .....

(c) .....

8. Company A sends 4 L size boxes weighing 1kg and 5 M size boxes weighing 500g to Brunei using International Post which charges RM 330. Company B sends 7 size L boxes with the same weight and 10 M size boxes with also the same weight at RM 615. By assuming RM  $x$  is the cost to send the L size box and RM  $y$  is the cost for the M size box, find the value of  $x$  and  $y$  by **using the matrix method**.

*Syarikat A menghantar 4 kotak bersaiz L iaitu 1kg dan 5 kotak bersaiz M iaitu 500g ke Brunei menggunakan Pos Antarabangsa dengan bayaran RM 330. Syarikat B pula menghantar 7 kotak bersaiz L dengan berat yang sama dan 10 kotak bersaiz M dengan berat yang sama dengan bayaran RM 615. Dengan menganggap RM  $x$  ialah kos untuk menghantar kotak bersaiz L dan RM  $y$  ialah kos untuk menghantar kotak bersaiz M, cari nilai  $x$  dan  $y$  dengan menggunakan kaedah matriks.*

[5 marks]

[5 markah]

Answer/Jawapan :

**SULIT**

9. Diagram 5 shows a quadrant of a circle OQR and a sector of a circle OST with common centre O. OPS is right angle triangle.

It is given that  $OP = OS = 21$  cm and  $OP : PQ = 3:1$

Rajah 5 menunjukkan sukuan bulatan OQR dan sektor OST dengan pusat O. OPS adalah segitiga bersudut tegak.

Di beri bahawa  $OP = OS = 21$  cm dan  $OP : PQ = 3:1$

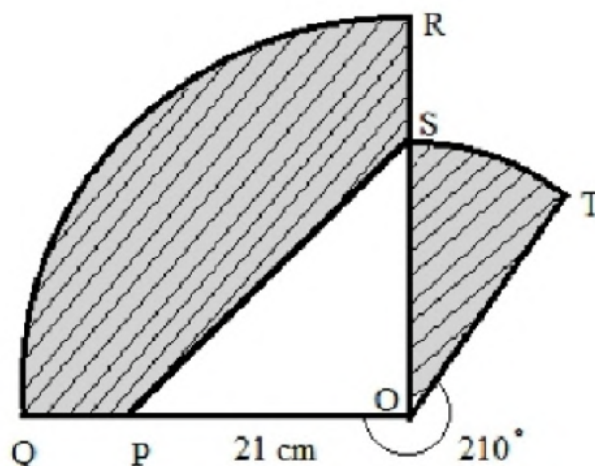


Diagram 5 / Rajah 5

Using  $\pi = \frac{22}{7}$ , calculate

Dengan menggunakan  $\pi = \frac{22}{7}$ , hitung

- the perimeter, in cm, of the whole diagram.  
perimeter, dalam cm, bagi seluruh rajah.
- the area, in  $\text{cm}^2$ , of the shaded region.  
luas, dalam  $\text{cm}^2$ , kawasan yang berlorek.

[6 marks]

[6 markah]

Answer / Jawapan:

(a)

(b)

**SULIT**

10. Diagram 6 shows three cards labelled with letter in basket 1 and four cards labelled with numbers in basket 2.

*Rajah 6 menunjukkan tiga keping kad berlabel dengan huruf di dalam bakul 1 dan empat keping kad berlabel dengan nombor di dalam bakul 2.*



Basket 1/Bakul 1



Basket 2/Bakul 2

Diagram 6 / Rajah 6

A card is drawn at random from basket 1 and basket 2.  
*Sekeping kad dipilih secara rawak daripada bakul 1 dan bakul 2.*

- (a) List all the possible outcomes of the events  
*Senaraikan semua kesudahan peristiwa yang mungkin.*
- (b) Hence, find the probability that  
*Seterusnya, cari kebarangkalian bahawa*
  - (i) both cards drawn are consonant are picked.  
*kedua-dua kad yang dipilih adalah konsonan.*
  - (ii) at least one card drawn is a vowel are picked  
*sekurang-kurangnya satu kad berhuruf vokal dipilih.*

[6 marks/markah]

Answer/Jawapan :

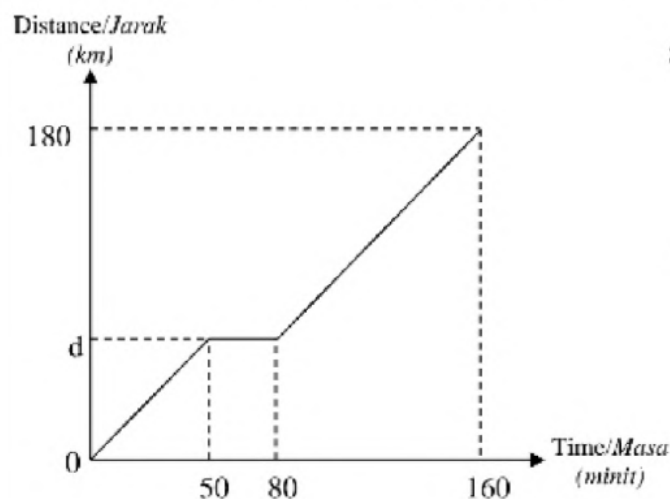
(a)

(b)(i)

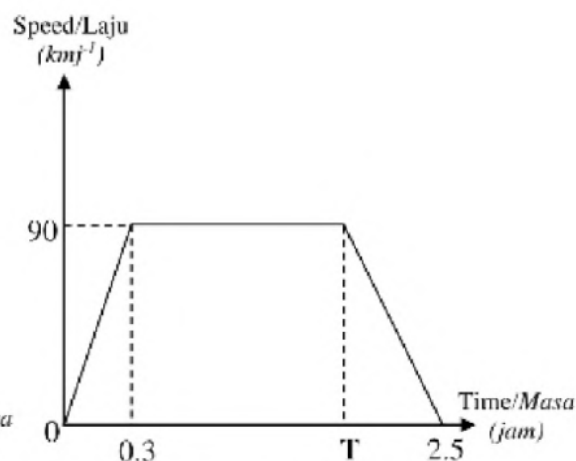
(ii)

11. Syahmi and Hariz individually drive their car from town P to town Q using the same route. Diagram 7(i) shows the distance-time graph for Syahmi's journey while diagram 7(ii) shows speed-time graph for Hariz's journey.

Syahmi dan Hariz masing-masing memandu kereta dari bandar P ke bandar Q mengikut lebuhraya yang sama. Rajah 7(i) menunjukkan graf jarak masa bagi perjalanan Syahmi manakala Rajah 7(ii) menunjukkan graf laju masa bagi perjalanan Hariz.



Rajah 7(i)



Rajah 7(ii)

- (a) State the duration of time, in minutes, during which syahmis's car is stationary.  
*Nyatakan tempoh masa, dalam minit, kereta Syahmi berhenti.*
- (b) Given Syahmi drive his car with the speed of  $82.5 \text{ kmj}^{-1}$  in the last 80 minutes.  
Calculate the value of d.  
*Diberi Syahmi memandu keretanya dengan laju  $82.5 \text{ kmj}^{-1}$  dalam tempoh 80 minit terakhir. Hitung nilai d.*
- (c) Calculate the value of T.  
*Hitung nilai T*

[6 marks/markah]

Answer/Jawapan :

(a)

(b)

(c)

## Section B / Bahagian B

[48 marks/markah]

Answer any **four** questions from this section.*Jawab mana-mana empat soalan daripada bahagian ini.*

12.

- (a) Complete Table 12 in the answer space for the equation
- $y = 2x^2 - 7x - 2$

*Lengkapkan Jadual 12 di ruang jawapan bagi persamaan  $y = 2x^2 - 7x - 2$* 

[2 marks]

[2 markah]

- (b) For this part of the question, use the graph paper provided. You may use a flexible curve rule.

*Untuk ceraihan soalan ini, gunakan kertas graf yang disediakan. Anda boleh menggunakan pembaris fleksibel.*

By 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  $y = 2x^2 - 7x - 2$  for  $-2 \leq x \leq 5$ .

*Dengan menggunakan skala 2 cm kepada 1 unit pada paksi-x dan 2 cm kepada 2 unit pada paksi-y, lukiskan graf  $y = 2x^2 - 7x - 2$  bagi  $-2 \leq x \leq 5$ .*

[4 marks]

[4 markah]

- (c) From your graph, find

*Daripada graf anda, carikan*

- (i) the value of  $y$  when  $x = 4.5$ .  
*nilai  $y$  apabila  $x = 4.5$ .*
- (ii) the positive value of  $x$  when  $y = 12$ .  
*nilai positif  $x$  apabila  $y = 12$ .*

[2 marks]

[2 markah]

- (d) Draw a suitable straight line on your graph to find the values of
- $x$
- which satisfies the equation
- $2x^2 = 9x + 3$
- for
- $-2 \leq x \leq 5$
- . State these values of
- $x$
- .

*Lukiskan satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai  $x$  yang memuaskan persamaan  $2x^2 = 9x + 3$  bagi  $-2 \leq x \leq 5$ . Nyatakan nilai-nilai  $x$  itu.*

[4 marks]

[4 markah]



Answer / Jawapan:

(a)  $y = 2x^2 - 7x - 2$

|     |    |      |    |    |    |    |   |   |    |
|-----|----|------|----|----|----|----|---|---|----|
| $x$ | -2 | -1.5 | -1 | 0  | 1  | 2  | 3 | 4 | 5  |
| $y$ | 20 |      | 7  | -2 | -7 | -8 |   | 2 | 13 |

Table 1 / Jadual 1

(b) Refer graph.  
Rujuk graf.

(c) (i)  $y = \dots\dots\dots$

(ii)  $x = \dots\dots\dots$

(d) Equation of the straight line / Persamaan garis lurus:  $\dots\dots\dots$

$x = \dots\dots\dots$  ,  $\dots\dots\dots$

- 13 (a) Transformation **T** is a translation  $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$ .

Transformation **R** is an anticlockwise rotation of  $90^\circ$  about the centre (1, 0).

*Penjelmaan **T** mewakili satu translasi  $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$*

*Penjelmaan **R** mewakili satu putaran melalui sudut  $90^\circ$  lawan arah jam pada pusat (1, 0).*

State the coordinates of the image of the point (5, 1) under each of the following transformations :

*Nyatakan koordinat imej bagi titik (5, 1) di bawah setiap penjelmaan berikut:*

- (i) **R**  
(ii) **T**<sup>2</sup>.

[ 3 marks]  
[3 markah ]

Answer/ Jawapan:

(a)(i)

(ii)

- b) Diagram 8 shows three hexagon  $ABCDEF$ ,  $GHIJKL$  and  $GNMPRS$  drawn on a Cartesian plane.  
Rajah 8 menunjukkan tiga buah sisi enam  $ABCDEF$ ,  $GHIJKL$  dan  $GNMPRS$  dilukis di atas satah Cartesian.

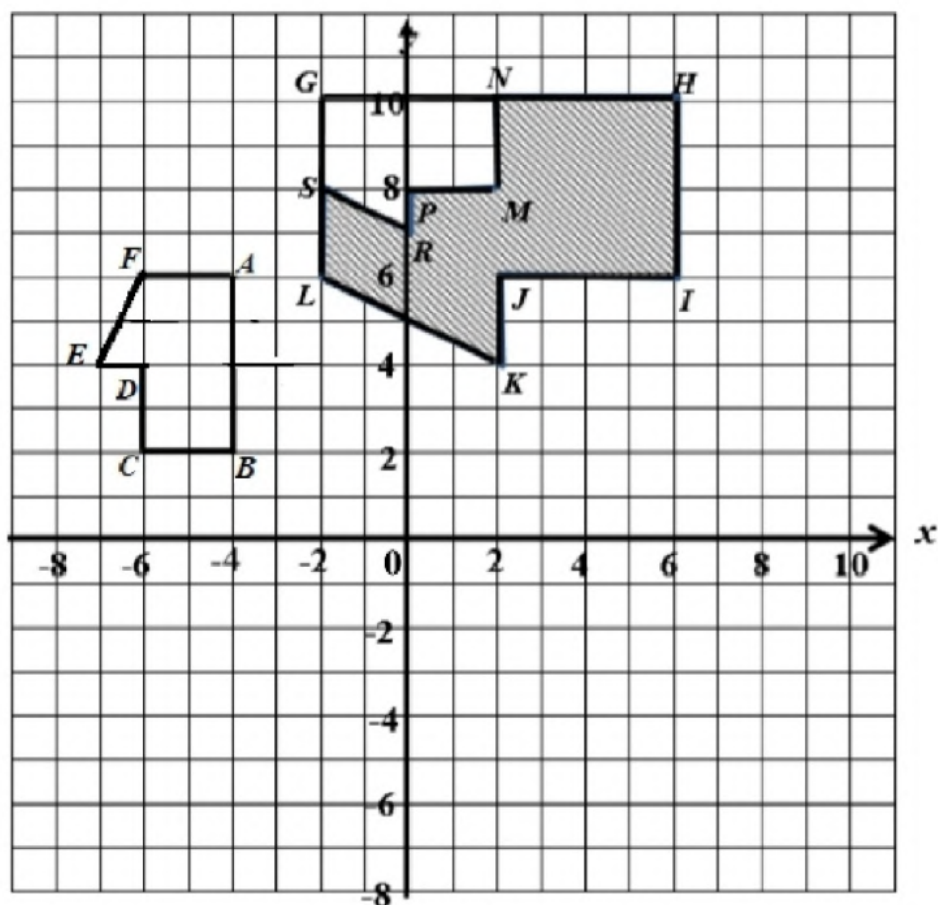


Diagram 8 / Rajah 8

- (i)  $GHIJKL$  is the image of  $ABCDEF$  under the combined UV.  
 $GHIJKL$  ialah imej bagi  $ABCDEF$  di bawah gabungan penjelmaan UV.  
Describe in full the transformation  
Huraikan selengkapnya penjelmaan
- (a) V,  
(b) U
- (ii) If the area of triangle  $ABCDE$  is  $130 \text{ cm}^2$ , calculate the area of the shaded region.  
Jika luas segitiga  $ABCDE$  ialah  $130 \text{ cm}^2$ , hitungkan luas kawasan berlorek.

[ 9 marks]

[9 markah]

**SULIT**

*Answer / Jawapan :*

b(i) (a) **V:**

(b) **U:**

(ii)

*Untuk  
Kegunaan  
Pemeriksa*

14. The data in Diagram 9 shows the temperature taken, in  $^{\circ}\text{C}$ , for 40 customers who want to enter the Shopping Mall during Conditional Movement Control Order (CMCO).

*Data dalam Rajah 9 menunjukkan suhu badan yang disaring, dalam  $^{\circ}\text{C}$ , bagi 40 orang pelanggan yang hendak memasuki sebuah pasaraya semasa Perintah Kawalan Pergerakan Bersyarat (PKPB).*

|      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|
| 37.4 | 35.9 | 35.7 | 35.9 | 36.0 | 37.7 | 36.1 | 37.2 | 37.3 | 36.2 |
| 36.2 | 36.4 | 38.1 | 38.5 | 36.3 | 36.5 | 36.5 | 37.1 | 37.2 | 36.6 |
| 36.6 | 36.7 | 36.7 | 36.8 | 36.8 | 36.9 | 36.9 | 37.1 | 37.2 | 37.2 |
| 37.3 | 37.3 | 35.5 | 37.6 | 37.6 | 36.6 | 37.7 | 37.7 | 36.7 | 36.7 |

Diagram 9 / Rajah 9

- (a) Using the data in Diagram 14, complete Table 14 in the answer space.  
*Dengan menggunakan data dalam Rajah 14, lengkapkan Jadual 14 di ruang jawapan.*
- [4 marks/markah]
- (b) Calculate the estimated mean temperature for one customer.  
*Hitung min anggaran bagi suhu badan seorang pelanggan.*
- [3 marks/markah]
- (c) For the part of the question, use the graph paper. You may use a flexible ruler. Using a scale of 2 cm to  $0.5^{\circ}\text{C}$  on the horizontal axis and 2 cm to 5 customers on the vertical axis, draw an ogive for the data.
- Untuk ceraiian soalan ini, gunakan kertas graf yang disediakan. Anda boleh menggunakan pembaris fleksibel. Dengan menggunakan skala 2 cm kepada  $0.5^{\circ}\text{C}$  pada paksi mengufuk dan 2 cm kepada 5 pelanggan pada paksi mencancang, lukis ogif bagi data itu.*
- [4 marks/markah]
- (d) From your ogive in 14(c), how many percentages of the customer who are not allowed to enter the shopping mall for those who have temperature above  $37^{\circ}\text{C}$ .
- Daripada ogif anda di 14(c), berapa peratuskah bilangan pelanggan yang tidak dibenarkan masuk ke pasaraya untuk suhu badan yang melebihi  $37^{\circ}\text{C}$ .*
- [1 marks/markah]

**SULIT**

Answer / Jawapan:

(a)

| Class Interval<br><i>Selang kelas</i> | Frequency<br><i>Kekerapan</i> | Upper Boundary<br><i>Sempadan Atas</i> | Midpoint<br><i>Titik Tengah</i> |
|---------------------------------------|-------------------------------|----------------------------------------|---------------------------------|
| 35.1 - 35.5                           |                               |                                        |                                 |
| 35.6 - 36.0                           |                               |                                        |                                 |
| 36.1 - 36.5                           |                               |                                        |                                 |
| 36.6 - 37.0                           |                               |                                        |                                 |
| 37.1 - 37.5                           |                               |                                        |                                 |
| 37.6 - 38.0                           |                               |                                        |                                 |
| 38.1 - 38.5                           |                               |                                        |                                 |

Table 2 / Jadual 2

(b)

(c) Refer graph / rujuk graf

(d)

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

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

- (a) Diagram 10.1 shows a solid right prism with square ABCD on a horizontal plane. The plane ABJFE is the uniform cross section of the prism.  $EF = IJ = 3$  cm.

Rajah 10.1 menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak pepejal itu berbentuk segi empat sama ABCD terletak di atas satah mengufuk. Satah ABJFE ialah keratan rentas seragam prisma tegak.  $EF = IJ = 3$  cm

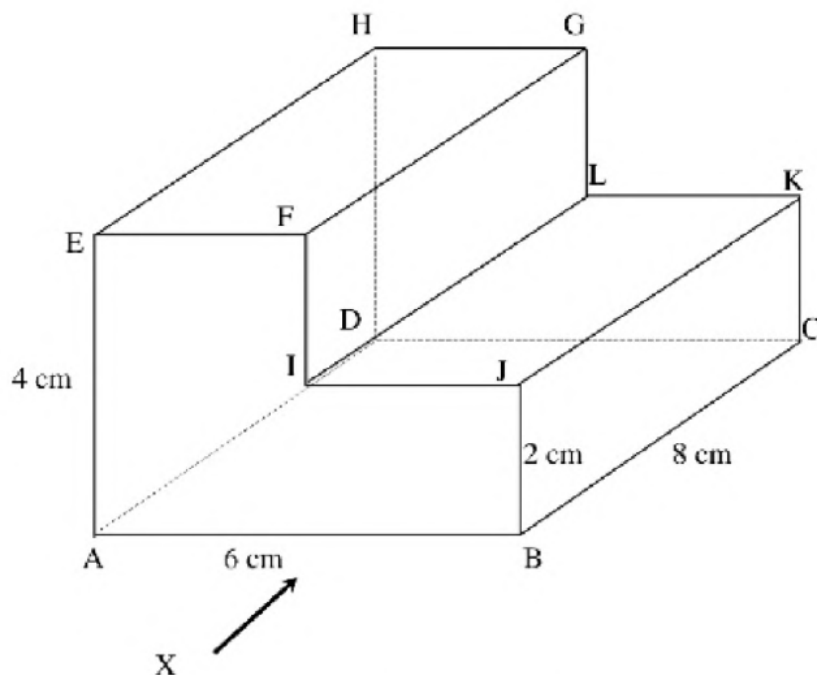


Diagram 10.1 / Rajah 10.1

Draw to full scale, the elevation of the vertical plane parallel to AB as viewed from X.

Lukiskan dengan skala penuh, dongakan pepejal itu pada satah mencancang yang selari dengan AB sebagaimana dilihat dari arah X.

[3 marks/markah]

Answer/Jawapan:

**SULIT**

- b) Another solid right prism with right angled triangle  $PQR$  as its uniform cross section is joined to the prism in Diagram 10.1 at the horizontal  $QRUT$ . It is given  $FP = SG = 2\text{ cm}$  dan  $PS = 4$ . The combined solid is shown in Diagram 10.2

*Sebuah pepejal lain berbentuk prisma tegak dengan segi tiga bersudut tegak  $PQR$  sebagai keratan rentas seragamnya dicantumkan kepada prisma dalam rajah 10.1 pada satah mengufuk  $QRUT$ . Diberi bahawa  $FP = SG = 2\text{ cm}$  dan  $PS = 4$ . Gabungan pepejal adalah seperti yang ditunjukkan dalam Rajah 10.2*

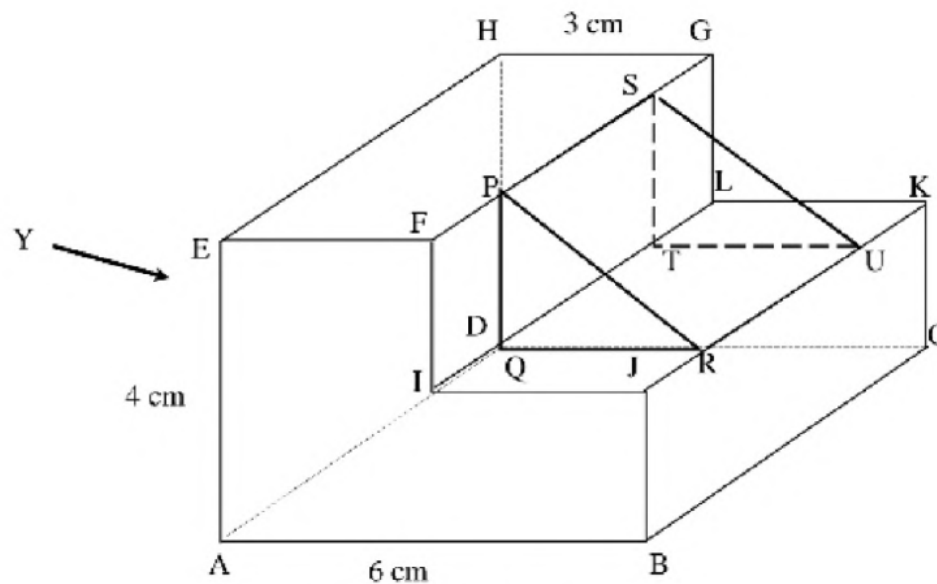


Diagram 10.2/Rajah 10.2

Draw to full scale,  
*Lukiskan dengan skala penuh,*

- (i) Draw to full scale, the plan of the solid  
*Lukis dengan skala penuh, pelan pepejal itu.*

[4 marks/markah]

- (ii) the elevation of the composite solid on a vertical plane parallel to  $DA$  as viewed from  $Y$ .

*Dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan  $DA$  sebagaimana dilihat dari  $Y$ .*

[5 marks/ markah]



$b(i)$ ,  $b(ii)$ :

16.  $P(65^\circ \text{ N}, 68^\circ \text{ W})$ ,  $Q$  and  $R$  are three points on the surface of the earth.  $PQ$  is a diameter of a parallel of latitude  $65^\circ \text{ N}$ .  $R$  is 4020 nautical miles, due south of  $Q$ .

*$P(65^\circ \text{ U}, 68^\circ \text{ B})$ ,  $Q$  dan  $R$  ialah tiga titik pada permukaan bumi.  $PQ$  ialah diameter selarian latitude  $65^\circ \text{ U}$ .  $R$  terletak 4020 batu nautika arah ke selatan  $Q$ .*

- (a) Calculate the distance, in nautical mile, of  $PQ$  measured along the common parallel of latitude.

*Hitung jarak, dalam batu nautika,  $PQ$  diukur sepanjang selarian latitud sepunya.*

[3 marks]

[3 markah]

- (b) Find the location of  $R$ .

*Cari kedudukan bagi  $R$ .*

[4 marks]

[4 markah]

- (c) Calculate the shortest distance in nautical mile, from  $P$  to  $R$  measured along the surface of the earth.

*Hitung jarak terpendek dalam batu nautika, dari  $P$  ke  $R$  yang diukur sepanjang permukaan bumi.*

[2 marks]

[ 2 markah]

- d) Two aeroplanes,  $G$  and  $H$ , took off from  $P$  to  $R$  at the same time. Plane  $G$  flew due east to  $Q$  and then due south to  $R$ . Plane  $H$  took the shortest route. Given that the average speed for both planes are 802 knots. Find the difference between the times of the arrival of the two planes.

*Dua buah kapal terbang  $G$  dan  $H$ , berlepas dari  $P$  ke  $R$  pada waku yang sama. Kapal terbang  $G$  terbang ke timur ke  $Q$  dan kemudian ke selatan ke  $R$ . Kapal terbang  $H$  mengambil laluan terpendek. Diberi bahawa purata laju bagi kedua-dua buah kapal terbang ialah 802 knot. Cari beza di antara masa ketibaan bagi dua buah kapal terbang itu.*

[3 marks]

[3 markah]

Answer/Jawapan:

(a)

(b)

(c)

(d)

**QUESTION PAPER END  
KERTAS SOALAN TAMAT**

# MELAKA

## ***KERTAS***

1

(BONUS)

- 1 Round off 89 831 correct to three significant figures.  
*Bundarkan 89 831 betul kepada tiga angka bererti.*
- A 898  
B 899  
C 89 800  
D 89 900
- 2 Express 0.00596 in standard form.  
*Ungkapkan 0.00596 dalam bentuk piawai.*
- A  $5.96 \times 10^3$   
B  $5.96 \times 10^2$   
C  $5.96 \times 10^{-2}$   
D  $5.96 \times 10^{-3}$
- 3 Find the quotient of 0.002567 and 0.6. Round off the answer correct to three significant figures.  
*Cari hasil bahagi 0.002567 dengan 0.6. Bundarkan jawapan betul kepada tiga angka bererti*
- A 0.04  
B 0.0043  
C 0.00428  
D 0.004278
- 4 Encik Kassim has a cash of RM22 460. He wants to deposit RM8 500 in savings account and the rest in fixed deposit account. The bank offers a simple interest of 1.3% per annum for savings account and 3.7% per annum for fixed deposit account. Calculate his total savings after a year by giving the answer correct to two significant.  
*Encik Kassim mempunyai wang tunai sebanyak RM 22 460. Dia ingin menyimpan RM 8 500 ke dalam akaun simpanan dan selebihnya ke dalam akaun simpanan tetap. Bank menawarkan faedah sebanyak 1.3% setahun bagi akaun simpanan dan 3.7% setahun bagi akaun simpanan tetap. Hitung jumlah simpanannya selepas setahun dengan memberi jawapan betul kepada dua angka bererti.*
- A RM 62 720  
B RM 22 000  
C RM 22 500  
D RM 23 000
- 5 What is the value of digit 5 in the number  $524_8$ , in base ten?  
*Apakah nilai bagi digit 5 dalam nombor  $524_8$ , dalam asas sepuluh?*
- A 40  
B 64  
C 128  
D 320

- 6 Express the product of 11 and 22 as a number in base eight.  
 Ungkapkan hasil darab 11 dan 22 sebagai nombor dalam asas lapan.

A  $242_8$   
 B  $362_8$   
 C  $422_8$   
 D  $462_8$

- 7 In Diagram 1,  $PQRST$  is a regular pentagon and  $TUVSWZ$  is a regular hexagon.  
 Dalam Rajah 1,  $PQRST$  ialah sebuah pentagon sekata dan  $TUVSWZ$  ialah sebuah heksagon sekata.

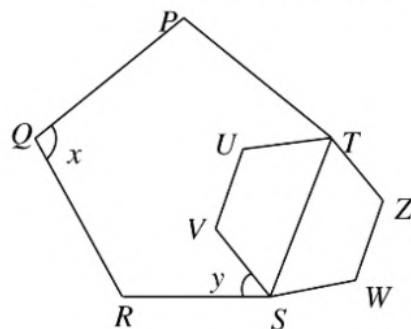


Diagram 1 / Rajah 1

Calculate  $x - y$

Hitung  $x - y$ .

- A  $48^\circ$   
 B  $60^\circ$   
 C  $70^\circ$   
 D  $300^\circ$
- 8 In diagram 2,  $JKLMN$  is a regular hexagon.  $PRL$  and  $KRQ$  are straight lines.  
 Dalam Rajah 2,  $JKLMN$  adalah sebuah heksagon sekata.  $PRL$  dan  $KRQ$  adalah garis lurus.

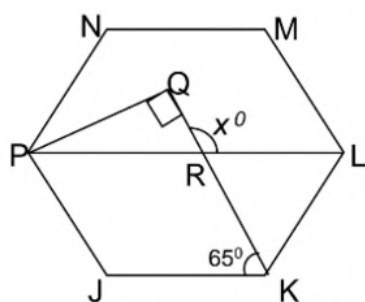


Diagram 2 / Rajah 2

Find the value of  $x$ .

Hitung nilai bagi  $x$

A  $65^\circ$   
 B  $75^\circ$   
 C  $115^\circ$   
 D  $150^\circ$

- 9 Diagram 3 shows two triangles drawn on square grids.

Rajah 3 menunjukkan tiga segitiga dilukis pada grid segi empat sama..

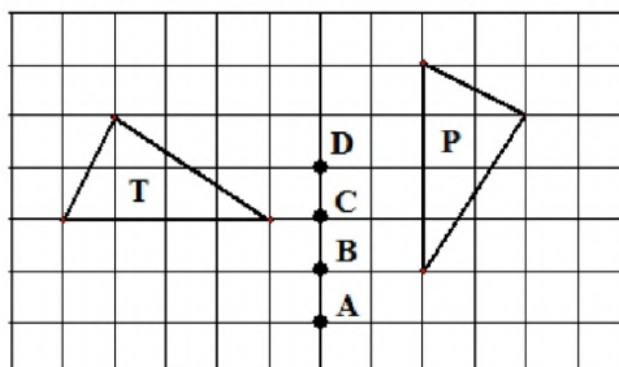


Diagram 3 / Rajah 3

$P$  is the image of  $T$  under a clockwise rotation of  $90^\circ$ .

Which of the points A, B, C or D, is the centre of the rotation?

$P$  ialah imej bagi  $T$  di bawah satu putaran  $90^\circ$  ikut arah jam.

Antara titik A, B, C atau D, yang manakah pusat putaran itu?

- A (2, 1)  
 B (1, 5)  
 C (3, 3)  
 D (5, 1)
- 10 Diagram 4 shows two rectangles drawn on square grids.

Rajah 4 menunjukkan dua segi empat tepat dilukis pada grid segi empat sama.

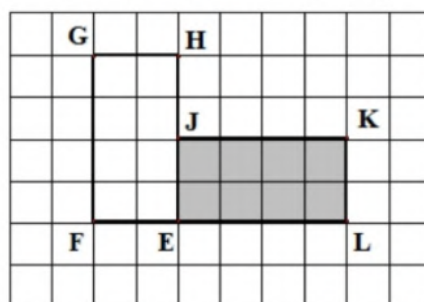


Diagram 4 / Rajah 4

$EJKL$  is the image of  $EFGH$  under a clockwise rotation

Which of the following is correct about the centre and angle of the rotation?

$EJKL$  ialah imej bagi  $EFGH$  di bawah satu putaran ikut arah jam.

Antara berikut, yang manakah pusat dan sudut putaran yang betul?

|   | Pusat /<br>Centre | Sudut Putaran /<br>Angle of Rotation |
|---|-------------------|--------------------------------------|
| A | E                 | $180^\circ$                          |
| B | J                 | $90^\circ$                           |
| C | J                 | $180^\circ$                          |
| D | E                 | $90^\circ$                           |

- 11 In Diagram 5,  $U$  is the midpoint of  $QT$ .  $PQRS$  is a straight line.  
 Dalam Rajah 5,  $U$  ialah titik tengah bagi  $QT$ .  $PQRS$  adalah garis lurus.

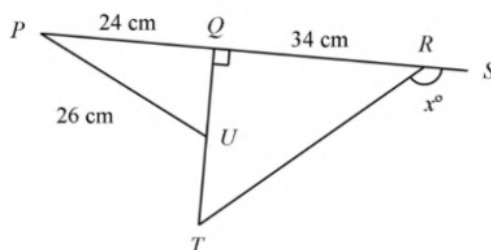


Diagram 5 / Rajah 5

Find the value of  $\tan x^\circ$   
 Cari nilai bagi  $\tan x^\circ$

- A  $-\frac{10}{17}$   
 B  $-\frac{5}{17}$   
 C  $\frac{10}{17}$   
 D  $\frac{5}{17}$
- 12 Diagram 6 shows point  $P$  and point  $Q$  lies on the arc of a unit of circle with centre  $O$ .  
 Rajah 6 menunjukkan titik  $P$  dan titik  $Q$  terletak pada lengkok suatu bulatan unit berpusat  $O$ .

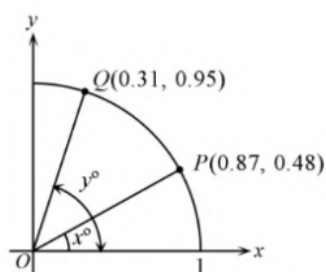


Diagram 6/ Rajah 6

Find the value of  $\cos x^\circ + \sin y^\circ$ .  
 Cari nilai sudut bagi  $\cos x^\circ + \sin y^\circ$ .

- A 0.79  
 B 1.26  
 C 1.35  
 D 1.82



13. Diagram 7 shows a right prism with a horizontal triangular base  $EGF$ .  $S$  and  $T$  are the midpoints of  $HK$  and  $EG$  respectively.

*Rajah 7, menunjukkan sebuah prisma tegak dengan tapak mengufuk segi tiga  $EGF$ .*

*$S$  dan  $T$  masing-masing ialah titik tengah bagi  $HK$  dan  $EG$ .*

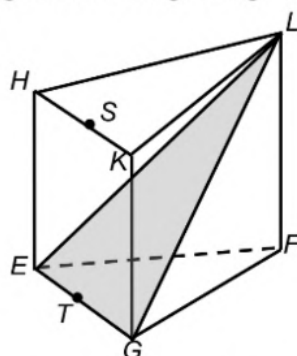


Diagram 7 / Rajah 7

Name the angle between the plane  $ELG$  and the plane  $EHKG$ .

*Namakan sudut di antara satah  $ELG$  dan satah  $EHKG$ .*

- A**  $\angle FEL$   
**B**  $\angle KGL$   
**C**  $\angle LGF$   
**D**  $\angle LTS$
14. Diagram 8 shows a vertical tower  $GN$  on a horizontal plane. The points  $L$ ,  $M$  and  $N$  lies on the plane.

*Rajah 8 menunjukkan sebuah menara tegak  $GN$  di atas satah mengufuk. Titik  $L$ ,  $M$  dan  $N$  terletak di atas satah tersebut.*

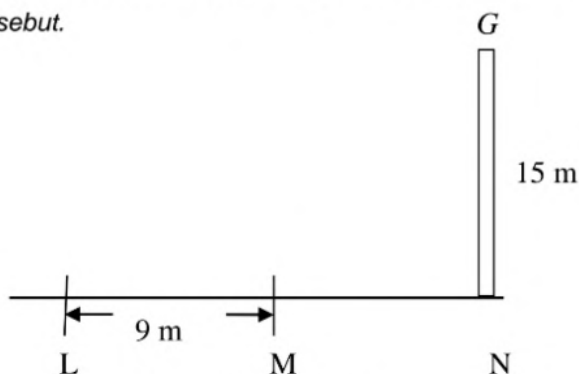


Diagram 8 / Rajah 8

The angle of elevation of  $G$  from  $M$  is  $45^\circ$ . Find the angle of depression of point  $L$  from  $G$ .

*Sudut dongakan  $G$  dari  $M$  ialah  $45^\circ$ . Cari sudut tunduk titik  $L$  dari titik  $G$ .*

- A**  $32^\circ$   
**B**  $52^\circ$   
**C**  $40^\circ$   
**D**  $58^\circ$

15. Diagram 9 shows two vertical poles,  $PQ$  and  $RS$ , on a horizontal plane.

*Rajah 9 menunjukkan dua tiang tegak,  $PQ$  dan  $RS$ , pada satah mengufuk.*

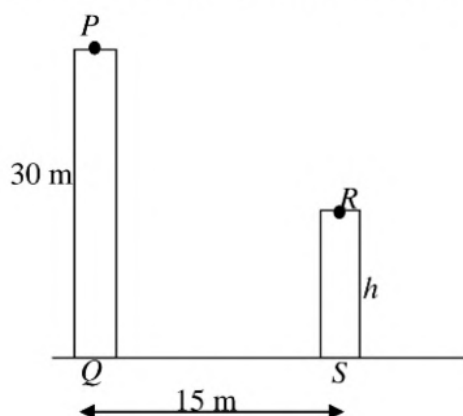


Diagram 9 / Rajah 9

The angle of elevation  $P$  from  $R$  is  $48^\circ$ . Calculate the value of  $h$ .

*Sudut dongakan titik  $P$  dari titik  $R$  ialah  $48^\circ$ . Hitung nilai  $h$ .*

- A** 11.34  
**B** 13.34  
**C** 15.02  
**D** 16.28
16. Diagram 10 shows the position of three points  $T$ ,  $V$  and  $W$  on a horizontal plane.  $T$  is to the North of  $V$  and bearing of  $W$  from  $T$  is  $089^\circ$ .

*Rajah 10 menunjukkan kedudukan tiga titik,  $T$ ,  $V$  dan  $W$  di atas suatu satah mengufuk.  $T$  terletak ke utara  $V$  dan bearing  $W$  dari  $T$  ialah  $089^\circ$ .*

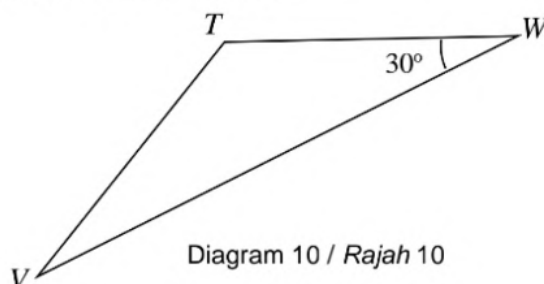


Diagram 10 / Rajah 10

The bearing of point  $V$  from point  $W$  is

*Bearing titik  $V$  dari titik  $W$  ialah*

- A**  $027^\circ$   
**B**  $117^\circ$   
**C**  $239^\circ$   
**D**  $250^\circ$

17.  $2(3x-y)^2 + 3x(2y) =$
- A  $9x^2 + y^2 + 3xy$
- B  $9x^2 - 3xy + y^2$
- C  $18x^2 - 6xy + 2y^2$
- D  $18x^2 + 2y^2 + 6xy$
18. In Diagram 11,  $P$ ,  $Q$  and  $R$  are three points on the earth and lie on the same meridian.  
 Dalam Rajah 11,  $P$ ,  $Q$  dan  $R$  ialah tiga titik pada permukaan bumi dan terletak pada meridian yang sama.

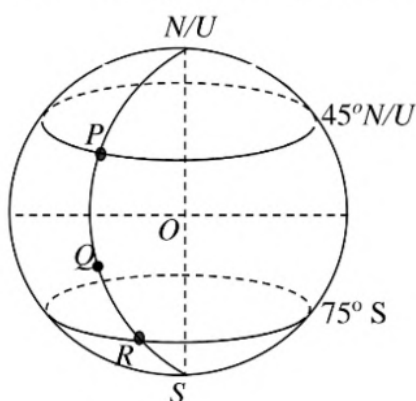


Diagram 11 / Rajah 11

- Given that  $PQ = 3QR$ , find the latitude of  $Q$   
 Diberi  $PQ = 3QR$ , cari latitude bagi  $Q$
- A  $30^\circ \text{ N / U}$
- B  $30^\circ \text{ S}$
- C  $45^\circ \text{ S}$
- D  $55^\circ \text{ S}$
19. Express  $\frac{m-5}{m} - \frac{3(7-m)}{m^2}$  as a single fraction in its simplest form.  
 Ungkapkan  $\frac{m-5}{m} - \frac{3(7-m)}{m^2}$  sebagai satu pecahan tunggal dalam bentuk termudah.
- A  $\frac{m^2 - 8m - 21}{m^2}$
- B  $\frac{m^2 - 2m - 21}{m^2}$
- C  $\frac{m^2 - 8m - 26}{m^2}$
- D  $\frac{m^2 - 2m - 26}{m^2}$

20. Given that  $R = 12\left(\sqrt{\frac{1}{3S+T}}\right)$ , express  $T$  in terms of  $R$  and  $S$ .

Diberi bahawa  $R = 12\left(\sqrt{\frac{1}{3S+T}}\right)$ , ungkapkan  $T$  dalam sebutan  $R$  dan  $S$ .

- A  $T = \frac{144}{R^2} - 3S$   
 B  $T = \frac{12}{R^2} - 3S$   
 C  $T = \frac{144}{R^2} - R^2S$   
 D  $T = \frac{12}{R^2} - R^2S$

21. Simplify  
Permudahkan

$$\frac{(k^6h^3)^{\frac{1}{3}}}{k^4}$$

- A  $k^2h^3$   
 B  $k^{-2}h$   
 C  $k^{-2}h^9$   
 D  $k^2$

22. Given that  $\left(\frac{3}{4}\right)^{2x-1} = 4^{3x-5} \times 3^{2x-1}$  find the value of  $x$ .

Diberi bahawa  $\left(\frac{3}{4}\right)^{2x-1} = 4^{3x-5} \times 3^{2x-1}$ , cari nilai  $x$ .

- A  $-4$   
 B  $\frac{4}{5}$   
 C  $\frac{6}{5}$   
 D  $4$

23. List all the integers  $x$  that satisfy both the inequalities  $x - \frac{1}{2} < 5$  and  $x - 4 \geq 2 - x$ ,

Senaraikan semua integer  $x$  yang memuaskan kedua-dua ketaksamaan  $x - \frac{1}{2} < 5$  dan  $x - 4 \geq 2 - x$ ,

- A 3, 4  
 B 4, 5  
 C 3, 4, 5  
 D 3, 4, 5, 6

24. Given that  $x$  is an integer, 3 and 4 is the solution for  
 Diberi  $x$  ialah integer, 3 dan 4 ialah penyelesaian bagi

- A  $-1 < x + 1 < 3$   
 B  $-1 < x - 3 < 2$   
 C  $1 < \frac{x}{3} \leq 3$   
 D  $-1 \leq 3x < 6$

25. In Diagram 12,  $VPSW$  is a common tangent to two circles,  $PQR$  and  $RSTU$  at points  $P$  and  $S$  respectively.  $PQ$  is parallel to  $SR$  and  $QRU$  is a straight line.  
 Dalam Rajah 12,  $VPSW$  ialah tangen sepunya kepada dua bulatan,  $PQR$  dan bulatan  $RSTU$  masing-masing pada titik  $P$  dan titik  $S$ .  $PQ$  adalah selari dengan  $SR$  dan  $QRU$  ialah garis lurus.

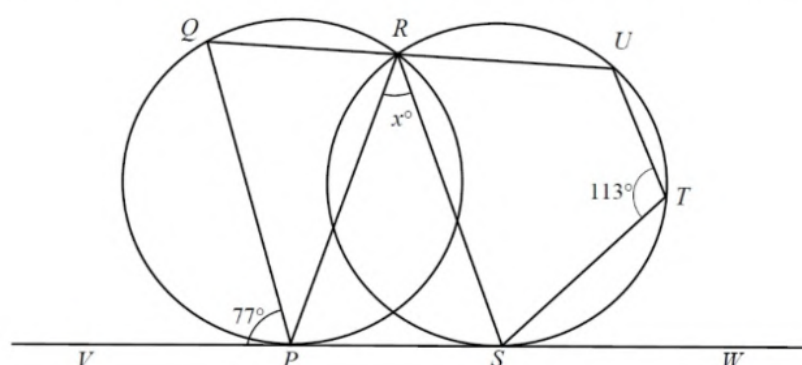


Diagram 12 / Rajah 12

Find the value of  $x$ .

Cari nilai  $x$ .

- A 26  
 B 36  
 C 67  
 D 77
26. Given  $5 - \frac{(3-p)}{p} = 8$ , find the value of  $p$ .

Diberi  $5 - \frac{(3-p)}{p} = 8$ , cari nilai bagi  $p$ .

- A  $-\frac{3}{2}$   
 B  $-\frac{3}{4}$   
 C  $\frac{2}{7}$   
 D  $\frac{2}{7}$

27. Diagram 13 shows an incomplete line graph representing the number of car sold in the first six months of the year. The profit gained in May is RM15 000.

Rajah 13 menunjukkan graf garis tidak lengkap yang mewakili bilangan kereta yang dijual dalam enam bulan pertama pada suatu tahun. Keuntungan yang diperoleh dalam bulan Mei ialah RM15 000.

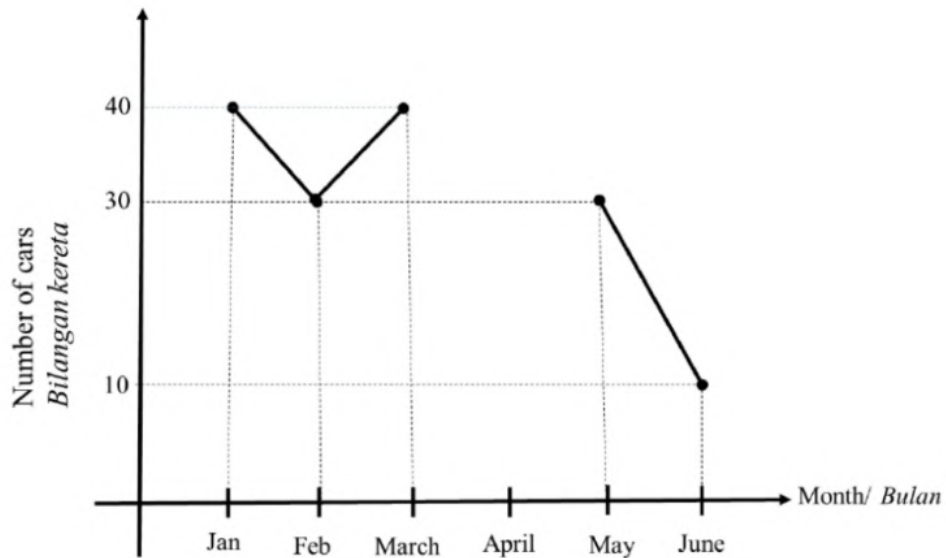


Diagram 13 / Rajah 13

If the total profit for the first five months is RM 98 500, find the number of cars sold in April.

Jika jumlah keuntungan bagi lima bulan pertama ialah RM 98 500, hitungkan bilangan kereta yang dijual dalam bulan April.

- A 36
- B 47
- C 56
- D 57

28. Table 1 shows the result of 90 students in a Mathematics quiz.

The number of students who scored grade *B*, *D* and *E* are not shown.

*Jadual 1 menunjukkan keputusan 90 orang murid dalam suatu kuiz Matematik.*

*Bilangan murid memperoleh gred B, D dan E tidak ditunjukkan.*

| Grade<br><i>Gred</i>                       | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> | <i>E</i> |
|--------------------------------------------|----------|----------|----------|----------|----------|
| Number of student<br><i>Bilangan murid</i> | 12       |          | 17       |          |          |

Table 1 / *Jadual 1*

The number of students who scored grade *B* and *D* is half of all students in the class. The number of students who scored grade *A* and *D* is twice of students who scored grade *C*.

*Bilangan murid yang memperoleh gred B dan D ialah separuh daripada semua murid di dalam kelas itu. Bilangan murid yang memperoleh gred A dan D ialah dua kali bilangan murid memperoleh gred C.*

Find the mode.

*Cari mod.*

- A** Grade B / *Gred B*
- B** Grade C / *Gred C*
- C** Grade D / *Gred D*
- D** Grade E / *Gred E*

29. Table 2 is a frequency table which shows the age of a group of children in a nursery.

*Jadual 2 ialah jadual kekerapan yang menunjukkan umur bagi sekumpulan kanak-kanak di sebuah taska.*

|                               |   |    |   |   |          |
|-------------------------------|---|----|---|---|----------|
| age<br><i>Umur</i>            | 4 | 5  | 6 | 7 | 8        |
| Frequency<br><i>Kekerapan</i> | 4 | 11 | 4 | 9 | <i>k</i> |

Table 2 / *Jadual 2*

It is given that *k* is half of the number of children age 6 years old. New two children with age 5 and 7 have registered in the nursery. Calculate the mean age of a children in the nursery.

*Diberi bahawa k adalah separuh daripada bilangan murid yang berumur 6 tahun. Dua orang kanak-kanak baharu yang berumur 5 tahun dan 7 tahun telah mendaftar di taska itu. Hitung min umur seorang kanak-kanak di taska itu.*

- A** 6.26
- B** 6.20
- C** 5.88
- D** 5.81



30 Diagram 14 shows four pictograms of items sold by two stalls during the sport day.

Rajah 14 menunjukkan empat piktograf barang yang dijual oleh dua gerai semasa hari sukan.

|                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Doughnuts</b><br/><b>Donat</b></p>  <p> - Represents 20 doughnuts<br/>- RM2.20 each<br/>- Mewakili 20 donat<br/>- RM2.20 setiap satu</p>    | <p><b>Ice cream</b><br/><b>Ais krim</b></p>  <p> - Represents 40 ice cream<br/>- RM2.00 each<br/>- Mewakili 40 ais krim<br/>- RM2.00 setiap satu</p>               |
| <p><b>Hot coffee</b><br/><b>Kopi panas</b></p>  <p> - Represents 35 cups<br/>- RM1.50 each<br/>- Mewakili 35 cawan<br/>- RM1.50 setiap satu</p> | <p><b>Carbonated drinks</b><br/><b>Minuman berkarbonat</b></p>  <p> - Represents 30 cups<br/>- RM1.00 each<br/>- Mewakili 30 cawan<br/>- RM1.00 setiap satu</p> |

Diagram 14 / Rajah 14

Ahmad stall sold doughnuts and hot coffee while Farid's stall sold ice cream and carbonated drinks. Find the difference, in RM, of the total sales between the two stalls.

Gerai Ahmad menjual donat dan kopi panas manakala gerai Farid menjual ais krim dan minuman berkarbonat. Cari beza, dalam RM, jumlah jualan antara kedua-dua gerai itu.

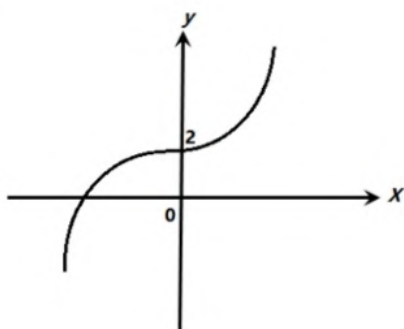
- A. 70
- B. 55
- C. 20
- D. 16



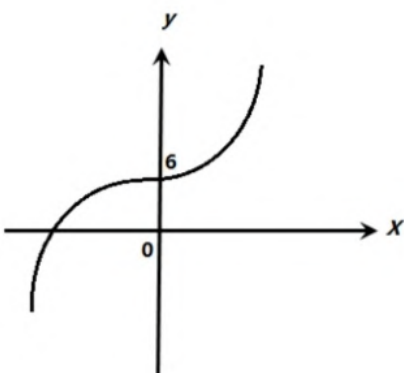
- 31 Which graph represents  $x^3 + \frac{y}{3} = 2$ ?

Graf yang manakah mewakili  $x^3 + \frac{y}{3} = 2$ ?

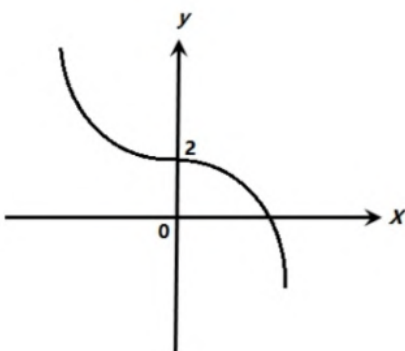
A



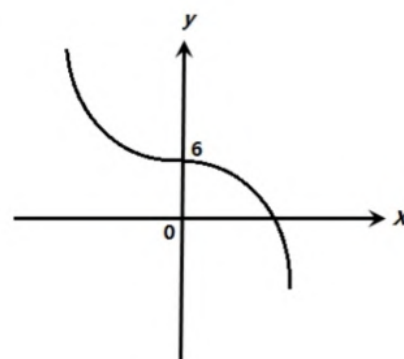
B



C



D



- 32 Diagram 15 shows a Venn diagram showing the elements in the universal set,  $\xi$ , set  $W$ , set  $X$  and set  $Y$ .

Rajah 15 menunjukkan gambarajah Venn yang menunjukkan unsur-unsur dalam set semesta,  $\xi$ , set  $W$ , set  $X$  dan set  $Y$ .

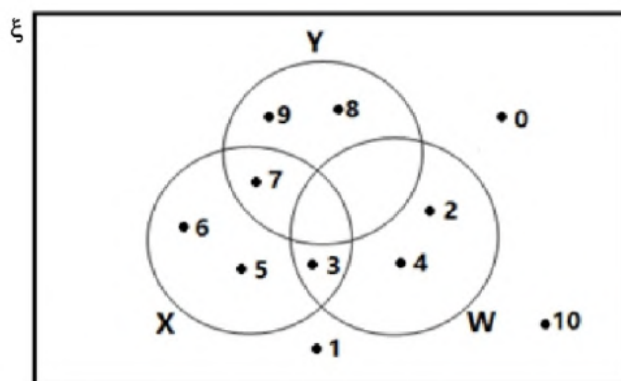


Diagram 15/ Rajah 15

List all the elements of set  $W \cap X \cup Y$ .

Senaraikan semua unsur bagi set  $W \cap X \cup Y$ .

- A {0, 1, 10}  
 B {2, 4, 5, 6}  
 C {2, 3, 4, 5, 6}  
 D {0, 1, 2, 3, 4, 5, 6, 10}
- 33 Given that the universal set,  $\xi = P \cup Q$ . If  $n(\xi) = 137$ ,  $n(Q) = 61$  and  $n(P \cap Q) = 29$ , find  $n(P)$ .  
 Diberi set semesta,  $\xi = P \cup Q$ . Jika  $n(\xi) = 137$ ,  $n(Q) = 61$  dan  $n(P \cap Q) = 29$  cari  $n(P)$ .

- A 76  
 B 105  
 C 134  
 D 135
- 34 Find the equation of a straight line  $ST$  that is parallel to the straight line  $2y = 3x + 4$  and passes through point  $(4, -5)$ .  
 Cari persamaan garis lurus  $ST$  yang selari dengan garis lurus  $2y = 3x + 4$  dan melalui titik  $(4, -5)$ .

- A  $y = \frac{3}{2}x + 4$   
 B  $y = \frac{3}{2}x - 5$   
 C  $y = \frac{3}{2}x - 11$   
 D  $y = \frac{3}{2}x - 22$

35. The diagram below shows two straight lines,  $PQ$  and  $QR$ .  
*Rajah di bawah menunjukkan dua garis lurus,  $PQ$  dan  $QR$ .*

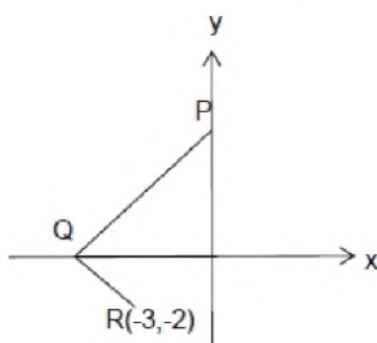


Diagram 16 / *Rajah 16*

The gradient of  $QR$  is  $-2$  and the distance of  $PQ$  is 5 units. Find the  $y$ -intercept of  $QR$ .  
*Kecerunan  $QR$  ialah  $-2$  dan jarak  $PQ$  ialah 5 unit. Cari pintasan- $y$  bagi  $PQ$ .*

- A**      2  
**B**      3  
**C**      4  
**D**      5
36. A number is chosen at random from set  $S = \{1, 3, 4, 9, 12, 16, 25, 27, 29\}$ .  
Find the probability that the number chosen is a perfect square.  
*Satu nombor dipilih secara rawak daripada set  $S = \{1, 3, 4, 9, 12, 16, 25, 27, 29\}$ .  
Cari kebarangkalian bahawa nombor yang dipilih itu ialah kuasa dua sempurna.*

- A**       $\frac{1}{3}$   
**B**       $\frac{4}{9}$   
**C**       $\frac{5}{9}$   
**D**       $\frac{2}{3}$

37. A bag contains 6 black balls and 4 white balls. Jenny takes out 2 black balls and puts another 4 white balls into the bag. A ball is chosen at random from the bag. What is the probability of choosing a black ball?

*Sebuah beg mengandungi 6 biji bola berwarna hitam dan 4 biji bola berwarna putih. Jenny mengeluarkan 2 biji bola berwarna hitam dan memasukkan 4 biji lagi bola putih ke dalam beg itu. Sebiji bola dipilih secara rawak dari beg itu. Apakah kebarangkalian memilih sebiji bola berwarna hitam?*

- A  $\frac{2}{7}$   
B  $\frac{1}{3}$   
C  $\frac{2}{5}$   
D  $\frac{3}{4}$

38. Given that  $y$  varies inversely as  $3x - 1$  and  $y = 2$  when  $x = 1$ . Find the value of  $x$  when  $y = -1$ .

*Diberi bahawa  $y$  berubah secara songsang dengan  $3x - 1$  dan  $y = 2$  apabila  $x = 1$ , Cari nilai  $x$  apabila  $y = -1$*

- A  $-4$   
B  $-2$   
C  $-1$   
D  $3$

39. The table 3 shows the relations between three variables  $x$ ,  $y$  and  $z$ .

*Jadual 3 menunjukkan hubungan antara tiga pemboleh ubah  $x$ ,  $y$  dan  $z$ .*

| $x$ | $y$ | $z$ |
|-----|-----|-----|
| 3   | 6   | 2   |
| 10  | $w$ | 4   |

Table 3 / *Jadual 3*

Given that  $x$  varies directly with  $y$  and square of  $z$ . Find the value of  $w$ .

*Diberi bahawa  $x$  berubah secara langsung dengan  $y$  dan kuasa dua  $z$ . cari nilai  $w$ .*

- A  $w = 3$
- B  $w = 4$
- C  $w = 5$
- D  $w = 6$

- 40 Given that matrix  $M = \begin{pmatrix} 1 & x \\ 2 & 5 \end{pmatrix}$  and the determinant of  $M$  is  $-3$ , calculate the value of  $x$ .

*Diberi bahawa matriks  $M = \begin{pmatrix} 1 & x \\ 2 & 5 \end{pmatrix}$  dan penentu bagi  $M$  adalah  $-3$ , cari nilai  $x$ .*

- A 1
- B 2
- C 3
- D 4

END OF THE QUESTION PAPER  
KERTAS SOALAN TAMAT

**MELAKA**

***KERTAS***

**2**

(BONUS)

**Section A**  
**Bahagian A**  
[52 marks / 52 markah]

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

- 1 In diagram 1 in the answer space, shade the region that satisfies the following three inequalities,  $y \leq 4$ ,  $x \leq 8$  and  $2y > -x + 8$ .

Pada rajah 1 di ruang jawapan, lorekkan rantau yang memuaskan ketiga-tiga ketaksamaan berikut,  $y \leq 4$ ,  $x \leq 8$  and  $2y > -x + 8$ . [3 marks / 3 markah]

Answer / Jawapan)

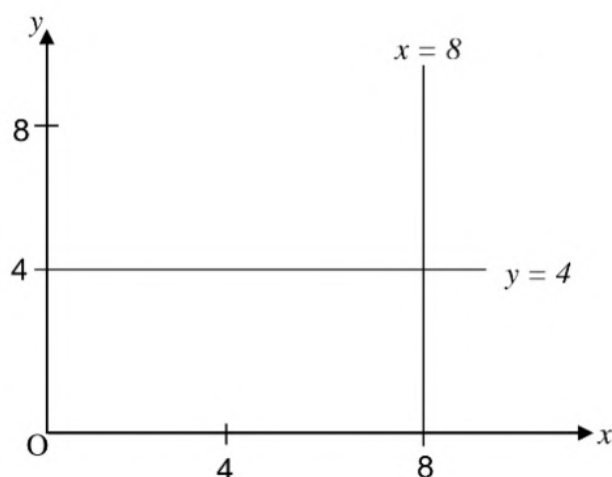


Diagram 1 / Rajah 1

- 2 Pak Putra's age now is 6 times the age of his grandson. 9 years ago, the product of their ages was 189. Find the age of Pak Putra and his grandson now.

Umur Pak Putra sekarang adalah 6 kali ganda umur cucunya. 9 tahun yang lepas, hasil darab umur mereka ialah 189. Cari umur Pak Putra dan cucunya sekarang.

[4 marks / 4 markah]

Answer / Jawapan:

3 Solution by **matrix method is not allowed** to answer this question.

Penyelesaian dengan **kaedah matriks tidak dibenarkan** untuk menjawab soalan ini.

For  
examiner's  
use

Angeline and Jonathan participated in a Science quiz which consisted of 30 questions.

Table 1 shows the number of correct and wrong answer obtained by them.

Angeline dan Jonathan menyertai suatu kuiz Sains yang terdiri daripada 30 soalan.

Jadual 1 menunjukkan bilangan jawapan betul dan salah yang diperolehi oleh mereka.

|          | Number of correct answers<br><i>Bilangan jawapan betul</i> | Number of wrong answers<br><i>Bilangan jawapan salah</i> | Total marks<br><i>Jumlah markah</i> |
|----------|------------------------------------------------------------|----------------------------------------------------------|-------------------------------------|
| Angeline | 23                                                         | 7                                                        | 124                                 |
| Jonathan | 16                                                         | 14                                                       | 68                                  |

Table 1 / Jadual 1

Each correct answer will be given  $x$  marks, while each wrong answer will be deducted  $y$  marks.

Find the value of  $x$  and of  $y$ .

Setiap jawapan yang betul akan diberikan  $x$  markah manakala setiap jawapan yang salah akan ditolak  $y$  markah. Cari nilai  $x$  dan nilai  $y$ .

[5 marks/5 markah]

Answer / Jawapan:



- 4 Diagram 2 shows a cuboid box with square base  $PQRS$  on a horizontal plane.  $PRT$  is a triangular glass that puts into the box.  $M$  is the midpoint of diagonal  $PR$ .

*Rajah 2 menunjukkan sebuah kotak berbentuk kuboid dengan tapak segiempat sama  $PQRS$  di atas satah mengufuk.  $PRT$  ialah sekeping kaca berbentuk segitiga yang diletakkan di dalam kotak itu.  $M$  ialah titik tengah bagi pepenjuru  $PR$ .*

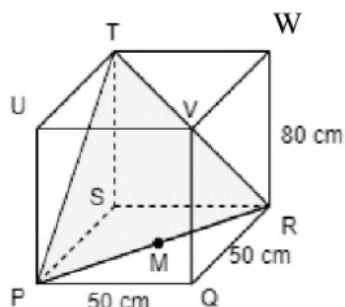


Diagram 2 / Rajah 2

State and calculate the angle between the glass  $PRT$  and the base  $PQRS$ .

*Nyatakan dan hitung sudut di antara kaca  $PRT$  dengan tapak  $PQRS$*

[3 markah / 3 marks]

Answer/ Jawapan:

- 5 (a) Given a matrix

*Diberi matriks*

$$M = \begin{pmatrix} 6 & -8 \\ -3 & 4 \end{pmatrix}$$

Determine whether the matrix  $M$  has an inverse or not?*Tentukan sama ada matriks  $M$  mempunyai songsangan atau tidak?*

[2 marks / 2 markah]

- (b) A burger stall sells egg burger and cheese burger, each available in small and large sizes. For both types of burgers, each small size is sold for RM  $x$  and each large size is sold for RM  $y$ . The number of burgers sold for an hour is shown in Table 2.

*Sebuah gerai burger menjual burger telur dan burger keju, setiap satunya boleh didapati dalam saiz kecil dan besar. Untuk kedua-dua jenis burger, setiap saiz kecil dijual dengan harga RM  $x$  dan setiap saiz besar dijual dengan harga RM  $y$ . Bilangan burger yang dijual dalam masa satu jam ditunjukkan dalam Jadual 2.*

| Size of burger<br>Saiz burger | Small<br>Kecil | Large<br>Besar |
|-------------------------------|----------------|----------------|
| Egg burger<br>Burger telur    | 8              | 5              |
| Cheese burger<br>Burger keju  | 6              | 4              |

Table 2 / Jadual 2

The stall collected RM 44 from the sale of egg burgers and RM 34 from the sale of cheese burgers.

*Gerai tersebut dapat mengumpul sebanyak RM 44 daripada jualan burger telur dan RM 34 daripada jualan burger keju.*

By using matrix method, calculate the price of a small burger and a large burger.

*Dengan menggunakan kaedah matriks, hitung harga burger saiz kecil dan saiz besar.*

[4 marks/ 4 markah]

Answer/ Jawapan:

(a)

(b)

6. (a) For each of the following statements, determine whether the statement is true or false.

*Untuk setiap pernyataan berikut, tentukan sama ada pernyataan ini benar atau palsu.*

- (i) 1 is a prime number and 11 is an odd number.

*1 ialah nombor perdana dan 11 ialah nombor ganjil.*

- (ii) 5 is a factor of 40 or 14 is a multiple of 4.

*5 ialah faktor bagi 40 atau 14 ialah gandaan bagi 4.*

- (b) Write down **two** implications based on the following statement:

*Tuliskan **dua** implikasi berdasarkan pernyataan berikut:*

$G \cap H = G$  if and only if  $G \subset H$

$G \cap H = G$  jika dan hanya jika  $G \subset H$

- (c) Complete the following argument.

*Lengkapkan hujah berikut.*

Premise 1: All cube have 6 faces.

*Premis 1: Semua kubus mempunyai 6 permukaan.*

Premise 2: .....

*Premis 2: .....*

Conclusion: Geometrical solid R has 6 faces.

*Kesimpulan: Pepejal geometri R mempunyai 6 permukaan.*

[ 5 marks / 5 markah]

Answer / Jawapan:

(a) (i) .....

(ii) .....

(b) (i) Implication 1 / *Implikasi 1*

.....

.....

(ii) Implication 2 / *Implikasi 2*

.....

.....

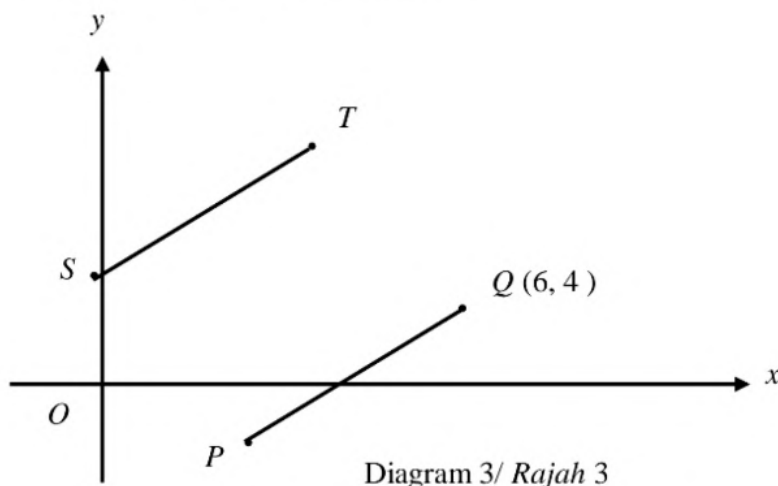
(c) Premise 2 / *Premis 2*: .....

.....

7. Diagram 3 shows a straight lines  $ST$  and a straight lines  $PQ$  drawn on a Cartesian plane.

$ST$  is parallel to  $PQ$ . Given that equation of the straight lines  $ST$  is  $2y = 8x + 3$ .

*Rajah 3 menunjukkan garis lurus  $ST$  dan  $PQ$ .  $ST$  dan  $PQ$  ialah garisan yang selari. Diberi persamaan garis lurus  $ST$  ialah  $2y = 8x + 3$ .*



Find,

*Carikan,*

- (a) the equation of the straight line  $PQ$ .  
*persamaan garis lurus  $PQ$ .*
- (b) the  $x$ -intercept of the straight line  $PQ$ .  
*pintasan- $x$  bagi garis lurus  $PQ$ .*

[ 5 marks / 5 markah]

Answer / *Jawapan:*

(a)

(b)

8. Table 3 shows the information for incomplete graph ABCD represents the journey of a motorbike from town P to town Q. The graph ACW represents the journey of a car from town P. The motorbike and the car leave town P at the same time and they travel along the same road.

*Jadual 3 menunjukkan maklumat bagi graf separa lengkap ABCD mewakili perjalanan sebuah motosikal itu dari bandar P ke bandar Q. Graf ACW mewakili perjalanan sebuah kereta itu dari bandar P. Motosikal itu dan kereta itu bertolak dari bandar P pada waktu yang sama dan melalui jalan yang sama.*

|                    |                                                                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.00 morning/ pagi | Motorbike and car leave from town P at the same time and the same route.<br><i>Motosikal dan kereta bertolak dari bandar P pada waktu yang sama dan melalui jalan yang sama.</i> |
| 7.45 morning/ pagi | Motorbike stopped for 35 minutes due to punctured tyre.<br><i>Motosikal berhenti selama 35 minit kerana tayarnya pancit</i>                                                      |
| 8.20 morning/ pagi | Motorbike continue its journey for another 42 km.<br><i>Motosikal menyambung perjalanan untuk 42 km lagi.</i>                                                                    |
| 9.20 morning/ pagi | Motorbike and car arrive the destination.<br><i>Motosikal dan kereta sampai ke destinasi.</i>                                                                                    |

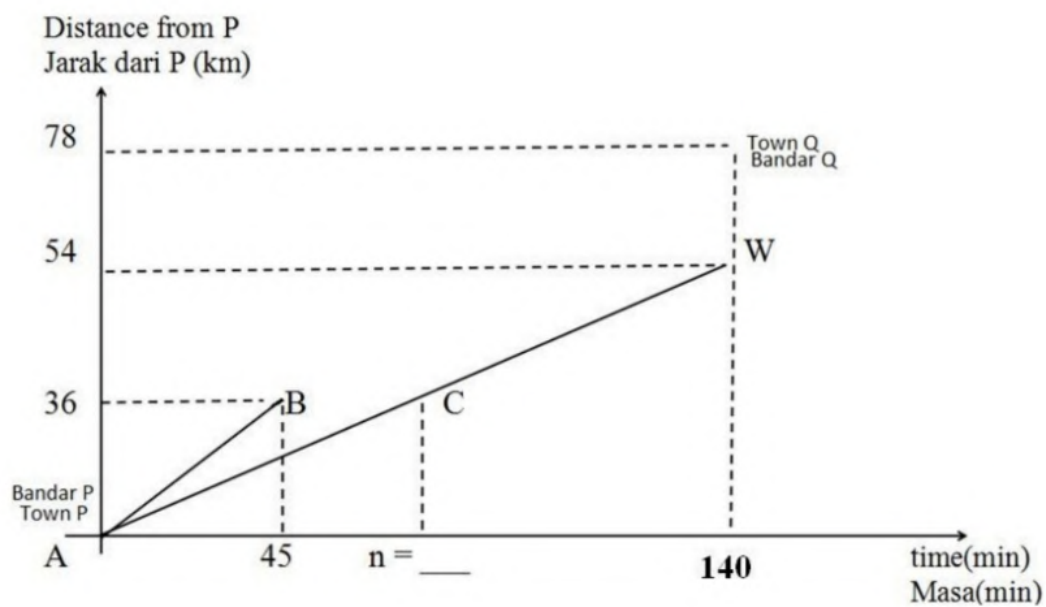
Table 3 / Jadual 3

- (a) Based on the above notes, complete the graph given in the answer space.  
*Berdasarkan catatan di atas, lengkapkan graf yang diberi di ruang jawapan.*
- (b) Calculate the average speed, in  $\text{km h}^{-1}$ , of the motorbike in the period of 140 minutes.  
*Hitung laju purata dalam  $\text{km h}^{-1}$ , motosikal itu bagi tempoh 140 minit.*
- (c) At a particular instant during the journey, both vehicles meet at a location.  
State the time, in minute, taken by the car from town P to reach the location they meet  
*Pada suatu ketika dalam perjalanan, kedua-dua kenderaan itu bertemu pada suatu lokasi.*  
*Nyatakan masa, dalam minit, yang diambil oleh kereta dari bandar P ke lokasi kedua-dua kenderaan itu bertemu.*

[5 marks/5 markah]

Answer/Jawapan:

a)



(b)

(c)

9. Table 4 shows two group of pupils involving in Mathematics Paper Work Presentation.

*Jadual 4 menunjukkan dua kumpulan murid yang terlibat dalam Pembentangan Kerja Projek Matematik.*

| Group 1/ Kumpulan 1 | Group 2/ Kumpulan 2 |
|---------------------|---------------------|
| Aidan               | Zaim                |
| Fadzlina            | Syakila             |
| Elisha              | Damia               |
| Luqman              |                     |

Table 4 / Jadual 4

A pupil is chosen at random from each group to present the paper work.

*Seorang murid dipilih dari setiap kumpulan untuk membuat pembentangan kerja projek.*

- (a) List all the possible outcomes of the event for this sample space. You may use the capital letter such as A for Aidan and so on.

*Senaraikan semua kesudahan yang mungkin bagi ruang sampel ini. Anda boleh menggunakan huruf besar seperti A untuk Aidan dan seterusnya.*

- (b) List all the possible outcomes and find the probability of the events that
- Senaraikan semua kesudahan peristiwa yang mungkin dan cari kebarangkalian bagi peristiwa tersebut bahawa*

- (i) Aidan or Damia is chosen.  
*Aidan atau Damia terpilih*
- (ii) At least one girl is chosen.  
*Sekurang – kurangnya seorang murid perempuan terpilih.*

[6marks / 6 markah]



Answer / Jawapan:

(a)

(b) (i)

(ii)

10. Diagram 5 shows a hemisphere bowl filled of cake mixture.

*Rajah 5 menunjukkan sebuah mangkuk berbentuk hemisfera yang diisi dengan adunan kek.*

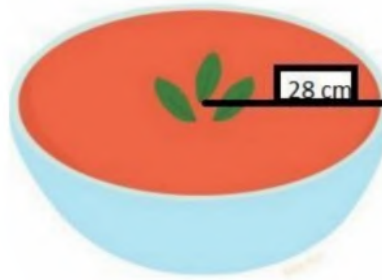


Diagram 5/ Rajah 5

The mixture then poured into a cylindrical mould of 21 cm radius to produce a cake. The whole mixture can produce 2 cakes. If the height of a cake is 14 cm, calculate the volume, in  $\text{cm}^3$ , of left over mixture.

*Adunan itu kemudiannya dituang ke dalam acuan berbentuk silinder yang berjejari 21 cm untuk menghasilkan 2 biji kek. Jika tinggi, sebiji kek itu ialah 14 cm, hitung isipadu, dalam  $\text{cm}^3$ , adunan yang tinggal*

(Use/ Guna  $\pi = \frac{22}{7}$ )

[ 4 marks / 4 markah]

Answer / Jawapan:

11. Diagram 6 shows semicircle  $PQR$ ,  $PUT$  and  $TSR$ .  $T$  is a centre of semicircle  $PQR$ .  $PTR$  is a straight line.

Rajah 6 menunjukkan separuh bulatan  $PQR$ ,  $PUT$  dan  $TSR$ .  $T$  ialah pusat separuh bulatan  $PQR$ .  $PTR$  ialah garis lurus.

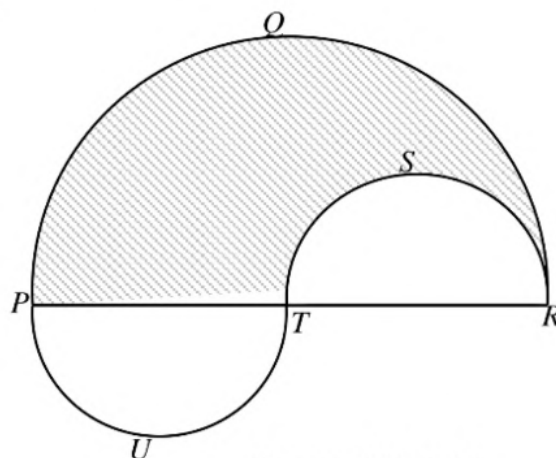


Diagram 6 / Rajah 6

It is given that  $PT = TR = 17$  cm. Using  $\pi = \frac{22}{7}$ , calculate

Diberi  $PT = TR = 17$  cm. Menggunakan  $\pi = \frac{22}{7}$ , hitung

- the perimeter, in cm, of the whole diagram,  
*perimeter, dalam cm, seluruh rajah.*
- the area, in  $\text{cm}^2$ , of the shaded region.  
*luas, dalam  $\text{cm}^2$ , kawasan yang berlorek itu.*

[6marks / 6markah]

Answer / Jawapan:

(a)

(b)

## Section B

## Bahagian B

[48 marks/48 markah]

Answer any **four** questions from this section.Jawab mana-mana **empat** soalan daripada bahagian ini.

12. (a) Complete the Table 5 in the answer space, for the question
- $y = 18 - x^3$
- ,

Lengkapkan Jadual 5 di ruang jawapan bagi persamaan  $y = 18 - x^3$ 

[2 marks / 2 markah]

- (b) 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
- $y = 18 - x^3$
- for
- $-3 \leq x \leq 4$

Mengguna skala 2 cm kepada 1 unit pada paksi-x dan 2 cm kepada 10 unit pada

paksi-y, lukis graf  $y = 18 - x^3$  untuk  $-3 \leq x \leq 4$ 

[4 marks / 4 markah]

- (c) From the graph in 12(b), find

Daripada graf di 12(b), cari

- (i) the value of y when
- $x = -1.5$

nilai y apabila  $x = -1.5$ .

- ii) the value of x when
- $y = -30$

nilai x apabila  $y = -30$ .

[2 marks / 2 markah]

- (d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation for
- $x^3 - 12x - 8 = 0$
- for
- $-3 \leq x \leq 4$
- . State these values of x.

Lukis satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai x yang memuaskan persamaan  $x^3 - 12x - 8 = 0$  bagi  $-3 \leq x \leq 4$ . Nyatakan nilai-nilai x.

[4 marks / 4 markah]

Answer / Jawapan:

(a)

|   |    |      |    |    |    |   |    |     |    |     |
|---|----|------|----|----|----|---|----|-----|----|-----|
| x | -3 | -2.5 | -2 | -1 | 0  | 1 | 2  | 2.5 | 3  | 4   |
| y | 45 | 33.6 |    | 19 | 18 |   | 10 | 2.4 | -9 | -46 |

Table 5 / Jadual 5

- (b) Refer to the graph on page 20

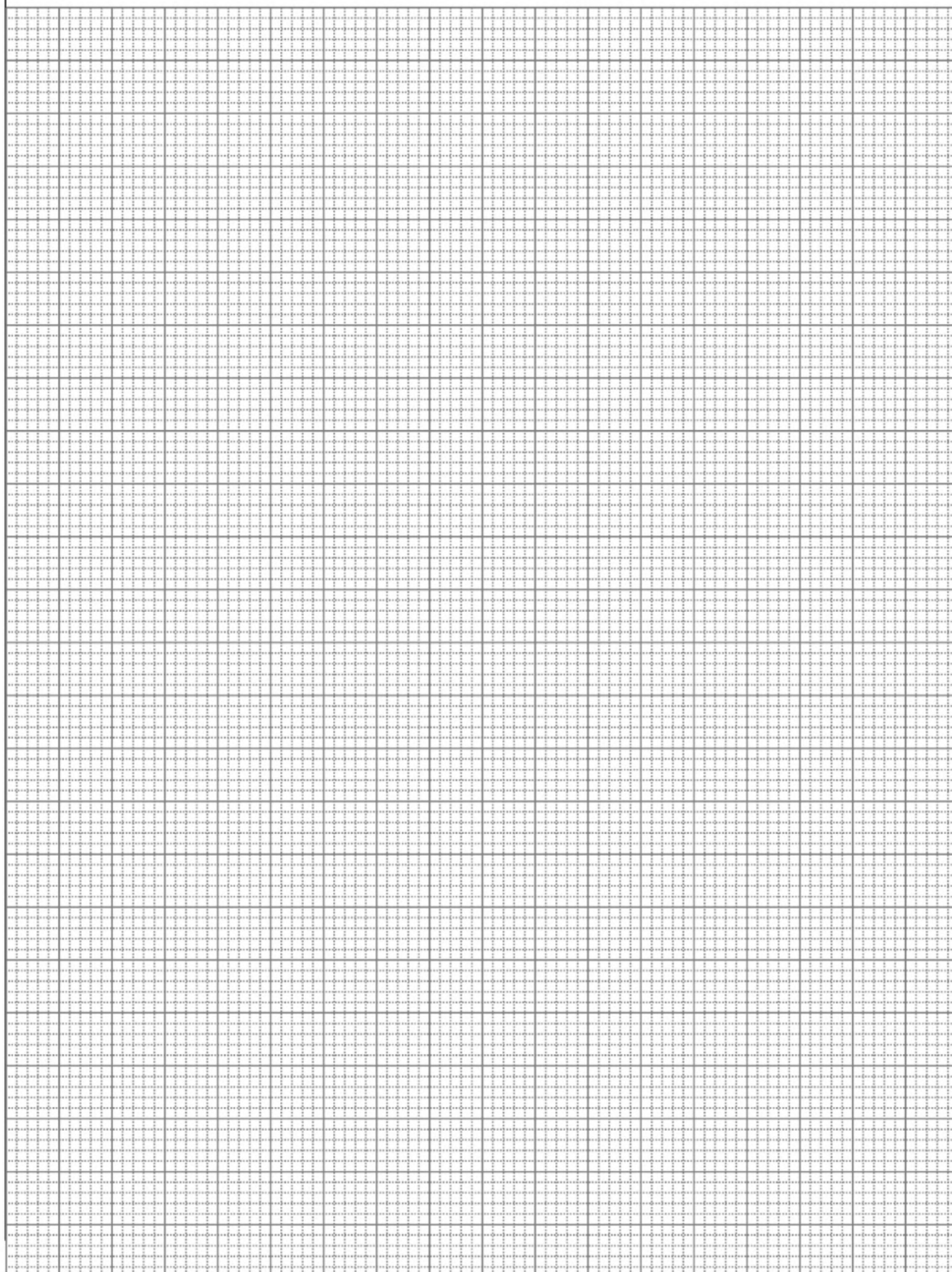
Rujuk graf di halaman 20

- (c) i)
- $y = \dots\dots\dots$

- ii)
- $x = \dots\dots\dots$

- (d)

Graph for Question 12 / Graf untuk Soalan 12



- 13(a) Transformation **N** is a translation  $\begin{pmatrix} -1 \\ -4 \end{pmatrix}$

Transformation **M** is a rotation of  $90^\circ$  clockwise about the centre  $(-1, 2)$

Penjelmaan **N** ialah satu translasi  $\begin{pmatrix} -1 \\ -4 \end{pmatrix}$

Penjelmaan **M** ialah satu putaran  $90^\circ$  ikut arah jam pada pusat  $(-1, 2)$

State the coordinates of the image of point  $(3, -2)$  under each of the following transformations:

Nyatakan koordinat imej bagi titik  $(3, -2)$  di bawah penjelmaan berikut:

(i) **N**<sup>2</sup>

(ii) **NM**

[ 4 marks/4 markah]

- (b) (i) Diagram 11.1 shows three quadrilaterals **ABCD**, **KLMN** and **PQRS**, drawn on a Cartesian plane.

Rajah 11.1 menunjukkan tiga segiempat **ABCD**, **KLMN** dan **PQRS**, dilukis pada suatu satah Cartes.

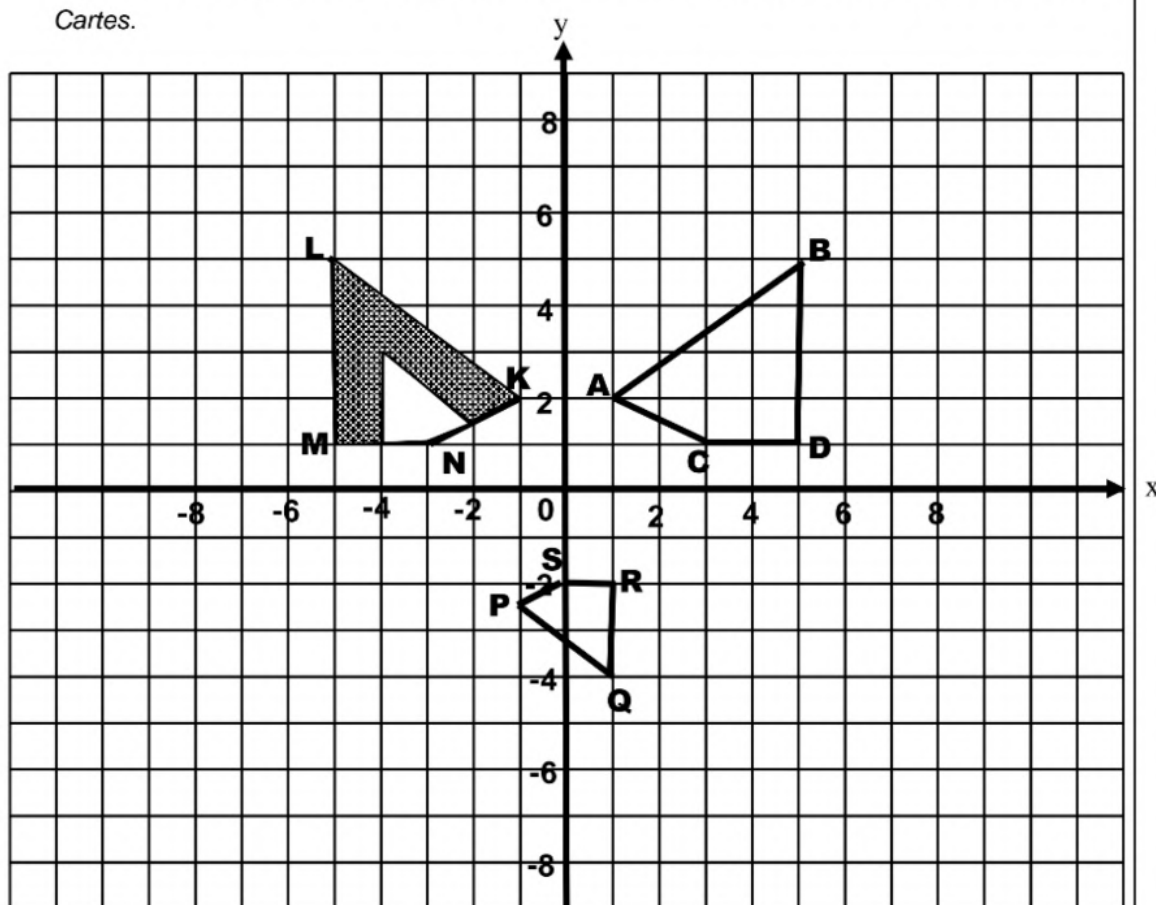


Diagram 11.1 / Rajah 11.1

**KLMN** is the image of **ABCD** under transformation **U**. **PQRS** is the image of **KLMN** under transformation **V**. Describe in full, the transformation:

**KLMN** ialah imej bagi **ABCD** di bawah penjelmaan **U**. **PQRS** ialah imej bagi **KLMN** di bawah penjelmaan **V**. Huraikan selengkapnya penjelmaan:

- (a) **U**  
(b) **V**
- (ii) Given that the area of **PQRS** is  $12\text{cm}^2$ , calculate the area, in  $\text{cm}^2$ , of the shaded region.  
Diberi bahawa luas bagi **PQRS** ialah  $12\text{ cm}^2$ , hitung luas, dalam  $\text{cm}^2$ , kawasan berlorek.

[8 marks /8 markah]

Answer/ Jawapan:

(a) (i)

(ii)

(b) (i) ( a )

(b)

(ii)



- 14 Diagram 12 shows a frequency polygon which represents about the length of 60 wooden bars manufactured by a factory.

*Rajah 12 menunjukkan satu poligon kekerapan yang mewakili tentang ukuran panjang 60 palang kayu yang dihasilkan oleh sebuah kilang.*

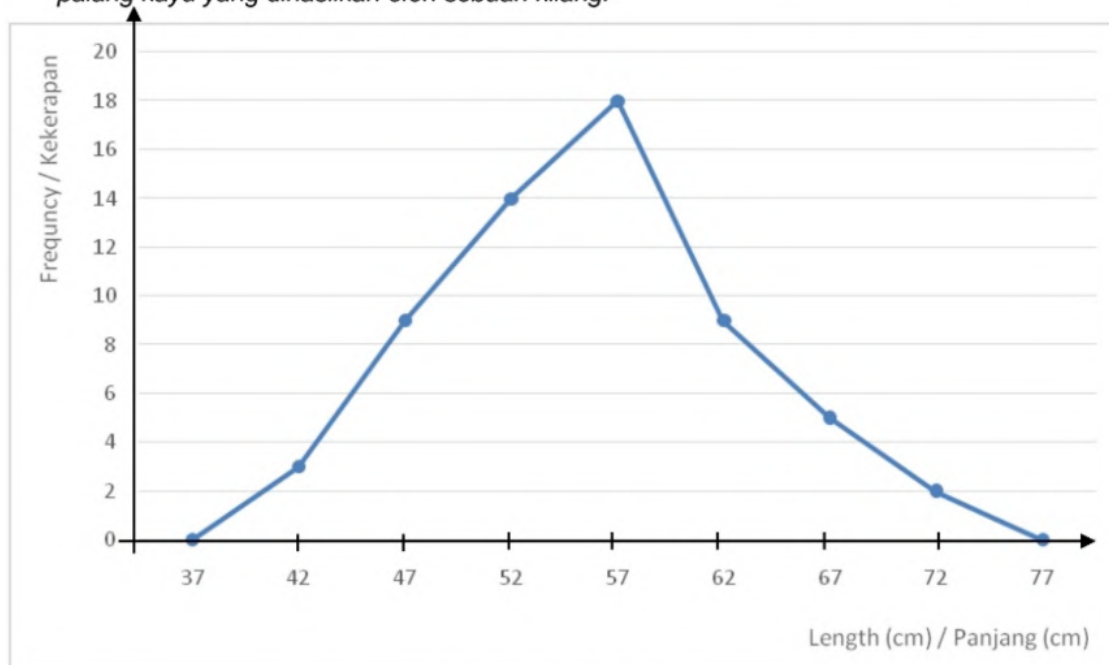


Diagram 12 / Rajah 12

- (a) Based on data in Diagram 12, complete Table 6 in the answer space.

*Dengan menggunakan data dari Rajah 12, lengkapkan Jadual 6 di ruang jawapan.*

[4 marks / 4 markah]

- (b) From the Table 6 in (a), calculate the estimated mean the length of a wooden bar.

*Berdasarkan Jadual 6 di (a), hitung min anggaran ukuran panjang sebatang palang kayu.*

[ 3 mark / 3 markah]

- (c) For this part of the question, use the graph provided.

*Untuk ceraiian soalan ini, gunakan kertas graf yang disediakan*

By using the scale of 2 cm to 5 cm on the horizontal axis and 2 cm to 5 wooden bars on the vertical axis, draw an ogive for the given data.

*Dengan menggunakan skala 2 cm kepada 5 cm pada paksi mengufuk dan 2 cm kepada 5 batang palang kayu pada paksi mencancang, lukis satu ogif bagi data tersebut.*

[4 marks / 4 markah]

- (d) From the ogive, find the median.

*Daripada ogif, cari median.*

[1 marks / markah]



Answer / Jawapan :

(a)

| <b>Length (cm)</b><br><b>Panjang (cm)</b> | <b>Frequency</b><br><b>Kekerapan</b> | <b>Upper boundary</b><br><b>Sempadan atas</b> | <b>Cumulative frequency</b><br><b>Kekerapan longgokan</b> |
|-------------------------------------------|--------------------------------------|-----------------------------------------------|-----------------------------------------------------------|
| 35 - 39                                   | 0                                    |                                               |                                                           |
|                                           |                                      |                                               |                                                           |
|                                           |                                      |                                               |                                                           |
|                                           |                                      |                                               |                                                           |
|                                           |                                      |                                               |                                                           |
|                                           |                                      |                                               |                                                           |
|                                           |                                      |                                               |                                                           |
|                                           |                                      |                                               |                                                           |

Table 6 / Jadual 6

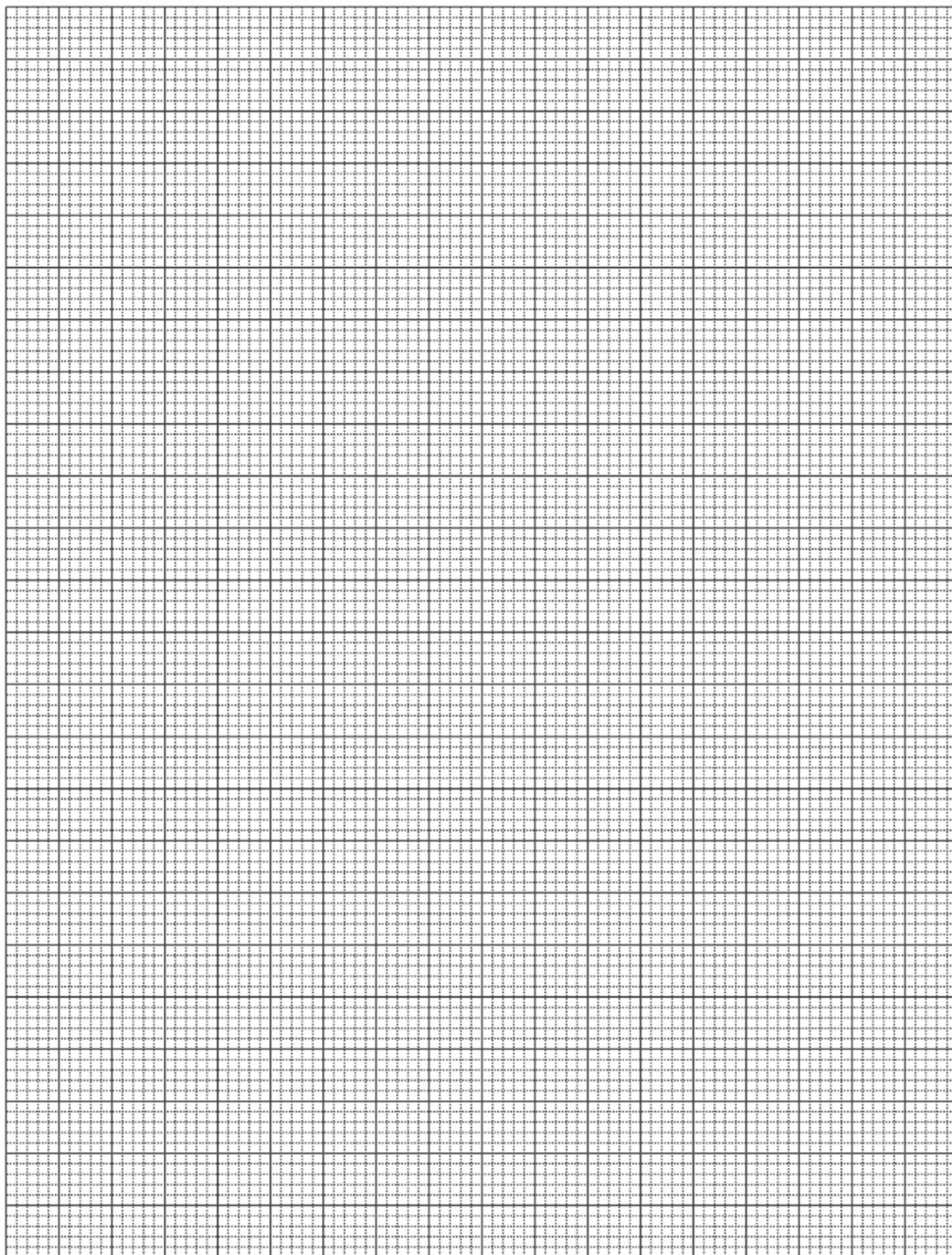
(b)

(c) Refer to the graph.

*Rujuk graf.*

(d)

**Graph for Question 14**  
**Graf Untuk Soalan 14**



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

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

- (a) Diagram 13.1 shows a combined solid formed by 2 right prism with a rectangular base AMND and a square base BCNM respectively on a horizontal plane. The plane AMBHGFE is the uniform cross-section of the combined solid. The square EFKL and rectangle GHIJ are horizontal planes. Rectangle FGJK and BCIH are inclined planes. Given  $GM = \frac{1}{2} AE$  and  $GM = JN$ .

*Rajah 13.1 menunjukkan sebuah gabungan pepejal yang terbentuk daripada 2 prisma tegak dengan tapak segi empat tepat AMND dan tapak segi empat sama BCNM masing-masing terletak di atas satah mengufuk. Satah AMBHGFE ialah keratan rentas seragam gabungan pepejal itu. Segi empat sama EFKL dan segi empat tepat GHIJ adalah satah-satah mengufuk. Segi empat tepat FGJK dan BCIH merupakan satah condong. Diberi  $GM = \frac{1}{2} AE$  dan  $GM = JN$ .*

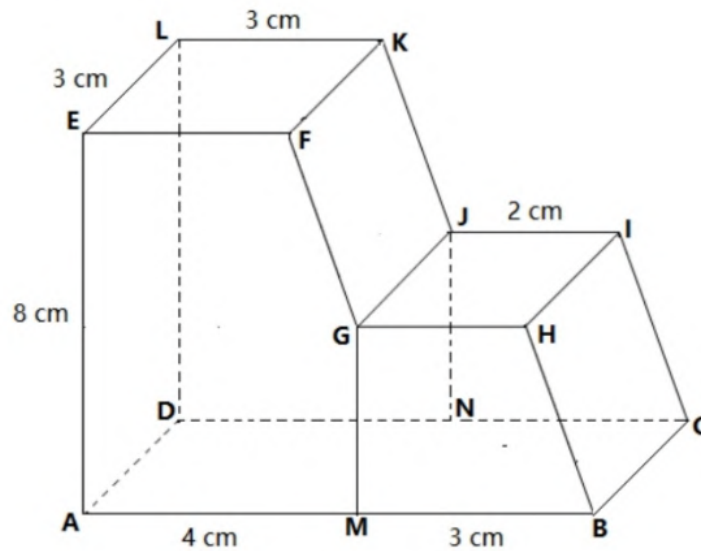


Diagram 13.1 / Rajah 13.1

Draw to full scale, the plan of the solid.

*Lukis dengan skala penuh, pelan pepejal itu.*

[ 3 marks / 3 markah ]

Answer / Jawapan:

- (b) A solid semi cylinder is cut and removed from the solid in Diagram 13.1. The remaining solid is shown in Diagram 13.2.

*Sebuah pepejal semi silinder dipotong dan dikeluarkan daripada pepejal dalam Rajah 13.1.*

*Pepejal yang tinggal adalah ditunjukkan dalam Rajah 13.2.*

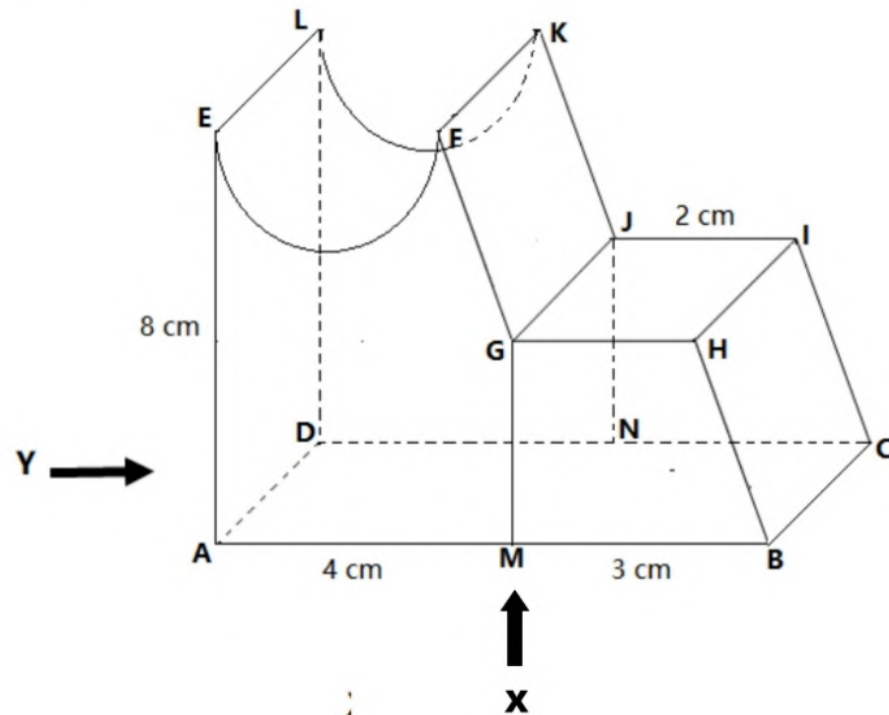


Diagram 13.2 / Rajah 13.2

Draw to full scale,

*Lukis dengan skala penuh,*

- (i) the elevation of the remaining solid on a vertical plane parallel to AMB as view from X.  
*dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan AMB sebagaimana dilihat dari X.*

[ 4 marks / 4 markah]

- (ii) the elevation of the remaining solid on a vertical plane parallel to AD as view from Y.  
*dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan AD sebagaimana dilihat dari Y.*

[ 5 marks / 5 markah]

Answer / Jawapan :  
b(i) (ii)

- 16 A(15°S,99°W), B(y°N,99°W), C and D are four points which lie on the surface of the earth.  
BD is the diameter of the common parallel of latitude.  
*A(15°S,99°B), B(y°N,99°B), C dan D adalah empat titik yang terletak pada permukaan bumi.  
BD ialah diameter selarian latitud sepunya.*

- a) Find the longitude of D.  
*Cari longitud bagi D.*

[2 marks/ 2 markah]

- b) B lies 4 800 nautical miles due north of A measured along surface of the earth.  
Calculate the latitude of B.  
*B terletak 4 800 batu nautika ke arah utara A diukur sepanjang permukaan bumi.  
Hitung latitud bagi B.*

[3marks/ 3 markah]

- c) Calculate the shortest distance, in nautical miles, from B to D measured along the surface of the earth.  
*Hitung jarak terpendek, dalam batu nautika, dari B ke D diukur sepanjang permukaan bumi.*

[3marks/ 3 markah]

- d) An aeroplane took off from C and flew due west to B and then flew due to south to A.  
The total time taken for the whole flight was 20 hours and 30 minutes.  
*Sebuah kapal terbang berlepas dari C dan terbang ke arah barat ke B dan kemudian terbang ke arah ke selatan A. Jumlah masa yang diambil bagi keseluruhan penerbangan itu ialah 20 jam 30 minit.*

- i) Calculate the distance, in nautical miles, from C to B, if  $BC = \frac{2}{3} BD$  measured along common parallel of latitude.  
*Hitung jarak dalam batu nautika, C ke B,  $BC = \frac{2}{3} BD$  diukur sepanjang selarian latitud sepunya.*
- ii) Calculate the average speed, in knots, of the whole flight.  
*Hitung laju purata, dalam knot, bagi keseluruhan penerbangan itu.*

[4 marks/ 4 markah]

Answer / Jawapan:

(a)

(b)

(c)

(d) (i)

(ii)

**END OF THE QUESTION PAPER  
KERTAS SOALAN TAMAT**

MAAFKAN SAYA ATAS SEGALA KEKURANGAN  
MODUL INI.

SEMOGA MODUL INI MEMBERI MANFAAT  
KEPADA SEMUA.