

## 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 biasa digunakan.

**RELATIONS  
PERKAITAN**

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

## 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 keraain 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 pyramid tegak* =  $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
- 11 Sum of interior angles of a polygon  
*Hasil tambah sudut pedalaman polygon*  
 =  $(n - 2) \times 180^\circ$

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

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

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

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

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

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

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

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

- 1 Round off 69919 correct to three significant figures.

*Bundarkan 69919 betul kepada tiga angka bererti.*

- A 700
- B 7000
- C 69900
- D 69920

- 2 Express 0.0196 in standard form.

*Ungkapkan 0.0196 dalam bentuk piawai.*

- A  $1.96 \times 10^{-3}$
- B  $1.96 \times 10^{-2}$
- C  $1.96 \times 10^2$
- D  $1.96 \times 10^3$

3  $\frac{0.0015}{3+2 \times 10^{-1}} =$

- A  $4.6875 \times 10^4$
- B  $2.005 \times 10^{-1}$
- C  $4.6875 \times 10^{-4}$
- D  $3.0 \times 10^{-5}$

- 4 Given that  $x$  is a number in base 2 such that  $31_8 < x < 11110_2$ , the possible value of  $x$  is

*Diberi bahawa  $x$  ialah nombor dalam asas 2 dengan keadaan  $31_8 < x < 11110_2$ , nilai yang mungkin bagi  $x$  ialah*

- A  $10111_2$
- B  $11000_2$
- C  $11011_2$
- D  $11111_2$

- 5 Express  $3 \times 5^3 + 2$  as a number in base five.

*Ungkapkan  $3 \times 5^3 + 2$  sebagai nombor dalam asas lima.*

- A  $23_5$   
 B  $32_5$   
 C  $302_5$   
 D  $3002_5$

- 6 In Diagram 1,  $ABCD$  is a quadrilateral and  $AB$  is parallel to  $CE$ .

*Dalam Rajah 1,  $ABCD$  ialah sebuah sisiempat dan  $AB$  adalah selari dengan  $CE$ .*

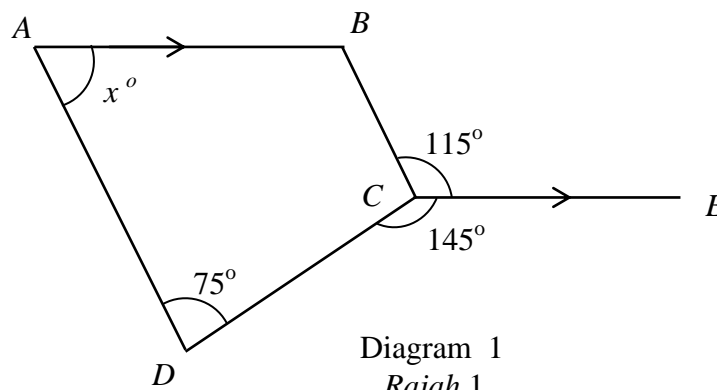


Diagram 1  
Rajah 1

The value of  $x$  is

*Nilai  $x$  ialah*

- A 65  
 B 70  
 C 80  
 D 120

7 In Diagram 2,  $PQRS$  is a rhombus.

*Dalam Rajah 2,  $PQRS$  adalah sebuah rombus.*

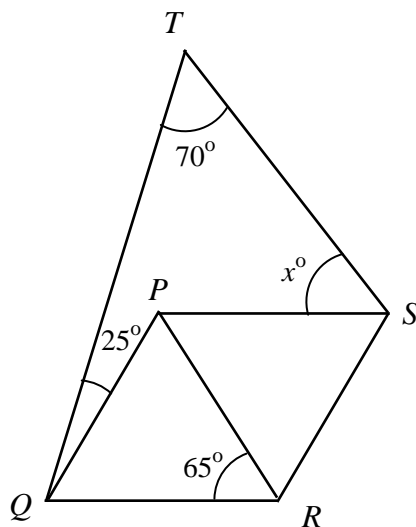


Diagram 2  
Rajah 2

The value of  $x$  is

*Nilai  $x$  ialah*

- A 15
- B 20
- C 25
- D 35

- 8 In Diagram 3,  $ABC$  and  $CDE$  are tangents to the circle with centre  $O$ , at  $B$  and  $D$  respectively.

*Dalam Rajah 3,  $ABC$  dan  $CDE$  adalah tangen untuk bulatan berpusat  $O$ , masing-masing di titik  $B$  dan  $D$ .*

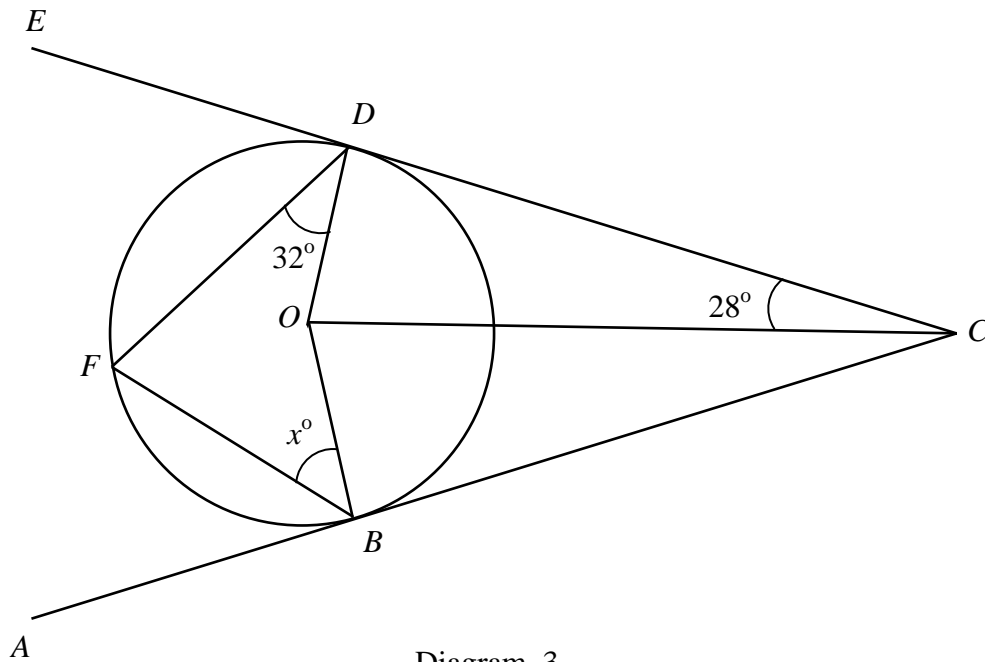


Diagram 3  
Rajah 3

The value of  $x$  is

*Nilai bagi  $x$  ialah*

- A 30
- B 32
- C 58
- D 62

- 9 In Diagram 4,  $P'$  is the image of  $P$  under a certain translation.  $Q'$  is the image of  $Q$  under the same translation.

*Dalam Rajah 4,  $P'$  ialah imej bagi  $P$  di bawah satu translasi tertentu.  $Q'$  ialah imej bagi  $Q$  di bawah translasi yang sama.*

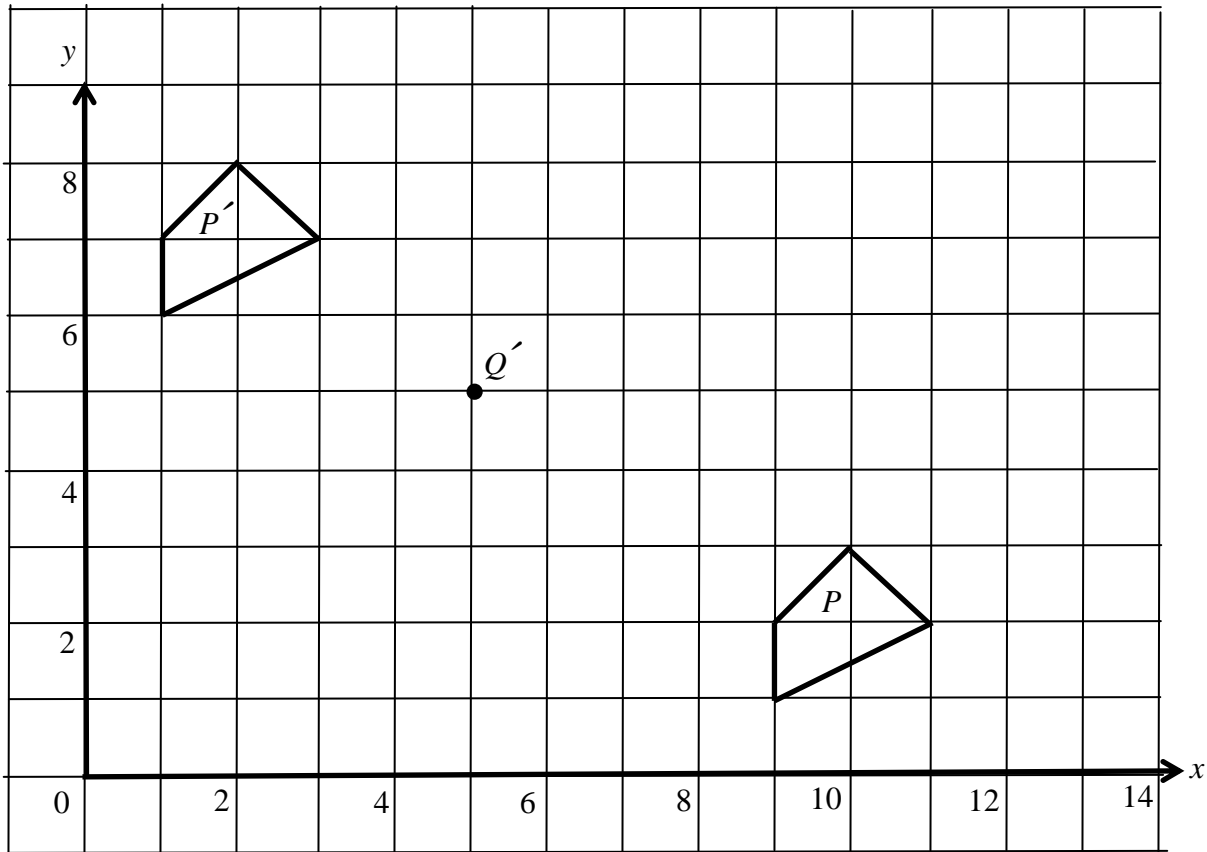


Diagram 4  
Rajah 4

Find the coordinates of  $Q$ .

*Carikan koordinat  $Q$*

- A  $(-3, 10)$
- B  $(13, 0)$
- C  $(-5, 12)$
- D  $(10, 13)$



10 Diagram 5 shows the point  $X$  which is the image of point  $Y$  under a reflection.

*Rajah 5 menunjukkan titik  $X$  adalah imej bagi titik  $Y$  di bawah satu pantulan.*

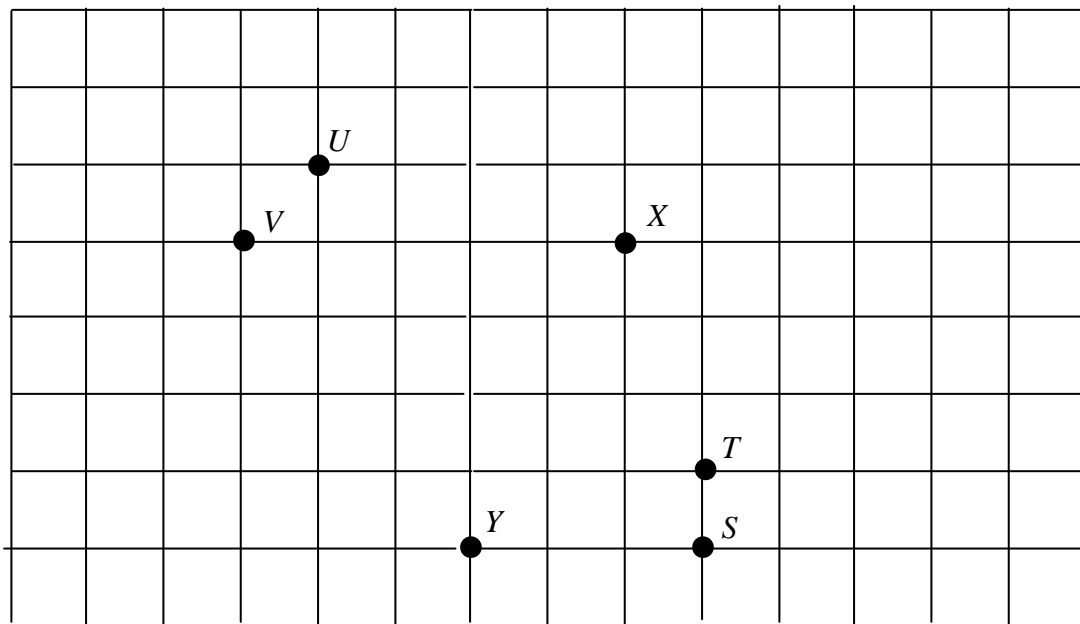


Diagram 5  
*Rajah 5*

Determine the axis of the reflection.

*Tentukan paksi pantulan tersebut.*

- A  $TV$
- B  $SU$
- C  $SV$
- D  $TU$

11 In Diagram 6, pentagon  $ABCDE$  is the image of the pentagon  $AFGHI$  under an enlargement.

*Dalam Rajah 6 pentagon  $ABCDE$  adalah imej bagi pentagon  $AFGHI$  di bawah satu pembesaran.*

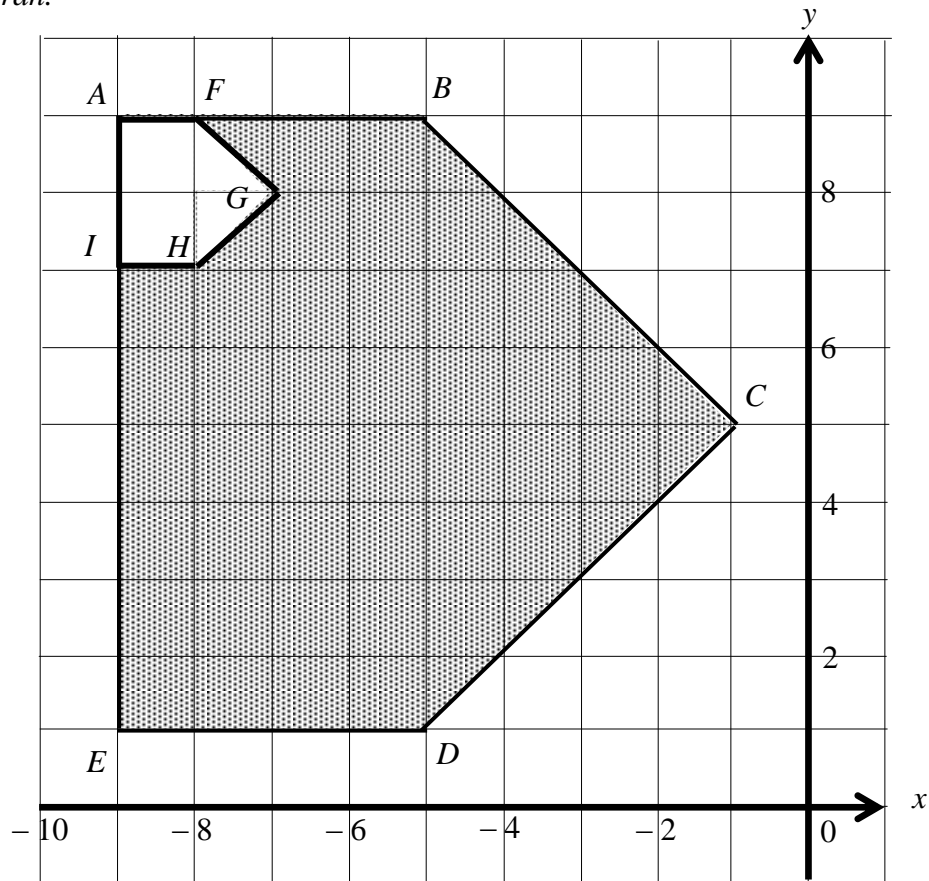


Diagram 6  
Rajah 6

If the area of the shaded region is  $360 \text{ cm}^2$ , calculate the area, in  $\text{cm}^2$ , of pentagon  $AFGHI$ .

*Jika luas kawasan berlorek ialah  $360 \text{ cm}^2$ , hitungkan luas, dalam  $\text{cm}^2$ , bagi pentagon  $AFGHI$ .*

- A 22.5
- B 24
- C 40
- D 120

12 In Diagram 7,  $PTR$  is a straight line. Given that  $\cos x^\circ = \frac{5}{13}$  and  $\sin y^\circ = \frac{3}{5}$ .

Dalam Rajah 7,  $PTR$  ialah garis lurus. Diberi bahawa  $\cos x^\circ = \frac{5}{13}$  dan

$$\sin y^\circ = \frac{3}{5}$$

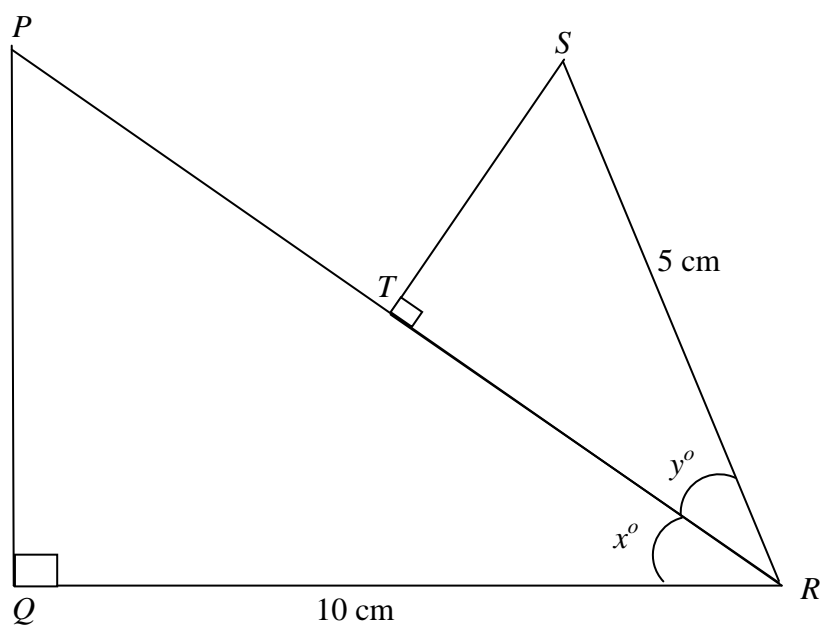


Diagram 7  
Rajah 7

Find the length, in cm, of  $PT$ .

Carikan panjang, dalam cm, bagi  $PT$ .

- A 10
- B 22
- C 23
- D 26



- 15 In Diagram 9,  $MN$  is a vertical television antenna on top of a building. Given that the angles of elevation of  $M$  and  $N$  from the point  $Q$  are  $31.3^\circ$  and  $28.1^\circ$  respectively.

*Dalam Rajah 9,  $MN$  ialah antena televisyen yang tegak di puncak sebuah bangunan. Diberi sudut dongakan  $M$  dan  $N$  dari titik  $Q$  masing-masing ialah  $31.3^\circ$  dan  $28.1^\circ$ .*

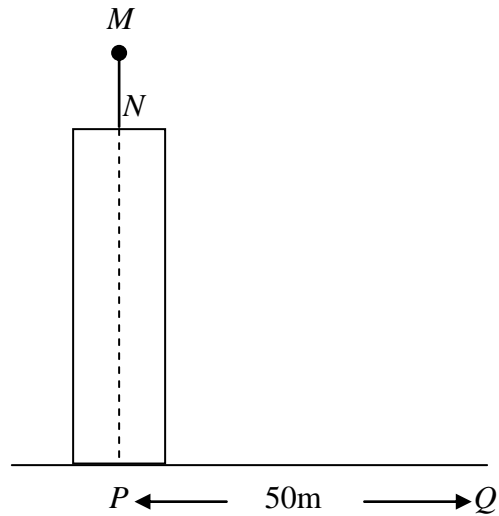


Diagram 9  
Rajah 9

Calculate the height, in m, of the television antenna.

*Hitungkan tinggi, dalam m, antena televisyen tersebut.*

- A 2.42
- B 2.80
- C 3.70
- D 11.40

16 In Diagram 10,  $P$ ,  $Q$  and  $R$  are three points on a horizontal plane.

*Dalam Rajah 10,  $P$ ,  $Q$  dan  $R$  adalah tiga titik di atas suatu satah mengufuk.*

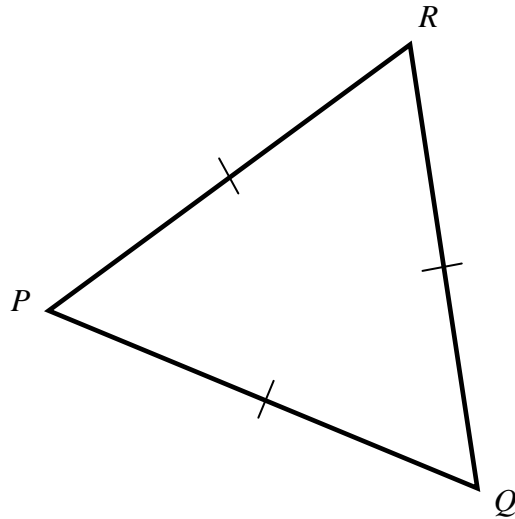


Diagram 10  
Rajah 10

Given that  $Q$  is due east of  $R$ , find the bearing of  $Q$  from  $P$ .

*Diberi bahawa  $Q$  berada di timur  $R$ , cari bearing  $Q$  dari  $P$ .*

- A  $030^\circ$
- B  $060^\circ$
- C  $120^\circ$
- D  $240^\circ$

- 17 An aeroplane flew 1320 nautical miles from  $P(80^\circ N, 10^\circ E)$  to  $Q$  via the North Pole. Find the position of  $Q$ .

*Sebuah pesawat terbang 1320 batu nautika dari  $P(80^\circ U, 10^\circ T)$  ke  $Q$  melalui Kutub Utara. Cari kedudukan  $Q$ .*

- A**  $(80^\circ N, 10^\circ E)$   
 $(80^\circ U, 10^\circ T)$
- B**  $(80^\circ N, 170^\circ W)$   
 $(80^\circ U, 170^\circ B)$
- C**  $(78^\circ N, 30^\circ E)$   
 $(78^\circ U, 30^\circ T)$
- D**  $(78^\circ N, 170^\circ W)$   
 $(78^\circ U, 170^\circ B)$

- 18 In Diagram 11,  $NOS$  is the polar axis of the Earth. Given that  $\angle PON = 50^\circ$  and  $\angle QOR = 120^\circ$ .

*Dalam Rajah 11,  $NOS$  ialah paksi bumi. Diberi  $\angle PON = 50^\circ$  dan  $\angle QOR = 120^\circ$ .*

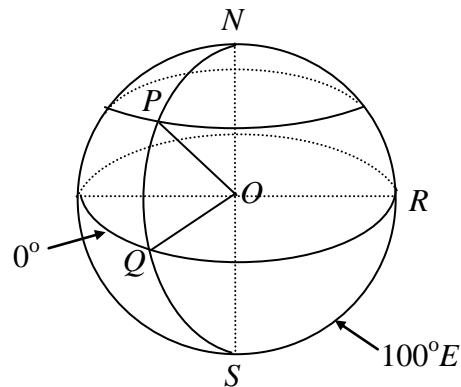


Diagram 11  
Rajah 11

Find the position of  $P$ .

*Carikan kedudukan  $P$ .*

- A** (  $40^\circ N$ ,  $20^\circ W$  )  
(  $40^\circ U$ ,  $20^\circ B$  )
- B** (  $40^\circ N$ ,  $120^\circ W$  )  
(  $40^\circ U$ ,  $120^\circ B$  )
- C** (  $50^\circ N$ ,  $20^\circ W$  )  
(  $50^\circ U$ ,  $20^\circ B$  )
- D** (  $50^\circ N$ ,  $120^\circ W$  )  
(  $50^\circ U$ ,  $120^\circ B$  )



19  $\frac{-24pq + 16q^2}{2q - 3p} =$

A  $-4q$

B  $-8q$

C  $4q$

D  $8q$

20 Factorise completely  $6mp - 12np - 4n + 2m$

*Faktorkan selengkapnya  $6mp - 12np - 4n + 2m$*

A  $(6p + 2)(m - 2n)$

B  $2(3p - 1)(m + 2n)$

C  $2(3p + 1)(m + 2n)$

D  $2(3p + 1)(m - 2n)$

21 Given that  $A = \frac{1}{2} \left( \sqrt[3]{\frac{B}{C}} \right)$ , express  $B$  in terms of  $A$  and  $C$ .

*Di beri bahawa  $A = \frac{1}{2} \left( \sqrt[3]{\frac{B}{C}} \right)$ , ungkapkan  $B$  dalam sebutan  $A$  dan  $C$ .*

A  $B = 2A^3C$

B  $B = 6A^3C$

C  $B = 8A^3C$

D  $B = \frac{A^3}{8C}$

- 22 Given that  $5(8 - m) = \frac{5m}{2} - 5$ , find the value of  $m$ .

Diberi  $5(8 - m) = \frac{5m}{2} - 5$ , carikan nilai  $m$ .

A 3

B  $5\frac{2}{3}$

C 6

D  $8\frac{2}{3}$

- 23 Express  $\frac{m-4}{4m} - \frac{2m-5}{m}$  as a single fraction in its simplest form.

Ungkapkan  $\frac{m-4}{4m} - \frac{2m-5}{m}$  sebagai satu pecahan tunggal dalam bentuk termudah.

A  $-\frac{7m+24}{4m}$

B  $\frac{16-7m}{4m}$

C  $\frac{1-m}{4m}$

D  $\frac{7m-16}{4m}$

24  $\frac{(3mn^3)^2}{3mn \times m^2n^3} =$

A  $\frac{2n^2}{m^2}$

B  $\frac{2n^2}{m}$

C  $\frac{3n^5}{m}$

D  $\frac{3n^2}{m}$

25 Given that  $2^{3x} = 32(2^{-x})$ , find the value of  $x$ .

*Diberi  $2^{3x} = 32(2^{-x})$ , cari nilai  $x$ .*

A  $\frac{3}{4}$

B 1

C  $\frac{5}{3}$

D  $\frac{5}{4}$

26 Given that  $h$  is an integer, find all the values of  $h$  that satisfy both inequalities

$$\frac{h}{4} < 2 \text{ and } 28 - 7h \leq -3.$$

*Diberi  $h$  ialah integer, carikan semua nilai  $h$  yang memuaskan kedua-dua ketaksamaan*

$$\frac{h}{4} < 2 \text{ dan } 28 - 7h \leq -3.$$

A 5, 6, 7

B 4, 5, 6, 7

C 5, 6, 7, 8

D 4, 5, 6, 7, 8

27 Table 1 shows the distribution of marks for 50 students.

*Jadual 1 menunjukkan taburan markah bagi 50 orang pelajar.*

Marks <i>Markah</i>	Number of students <i>Bilangan pelajar</i>
6 - 10	7
11 - 15	11
16 - 20	8
21 - 25	12
26 - 30	9
31 - 35	3

Table 1  
*Jadual 1*

Calculate the mean mark .

*Hitungkan min markah.*

- A 17.4
- B 19.4
- C 21.4
- D 37.6

28 Histogram in Diagram 12 shows the weight, in kg, of 30 students.

*Histogram dalam Rajah 12 menunjukkan berat, dalam kg, bagi 30 orang pelajar.*

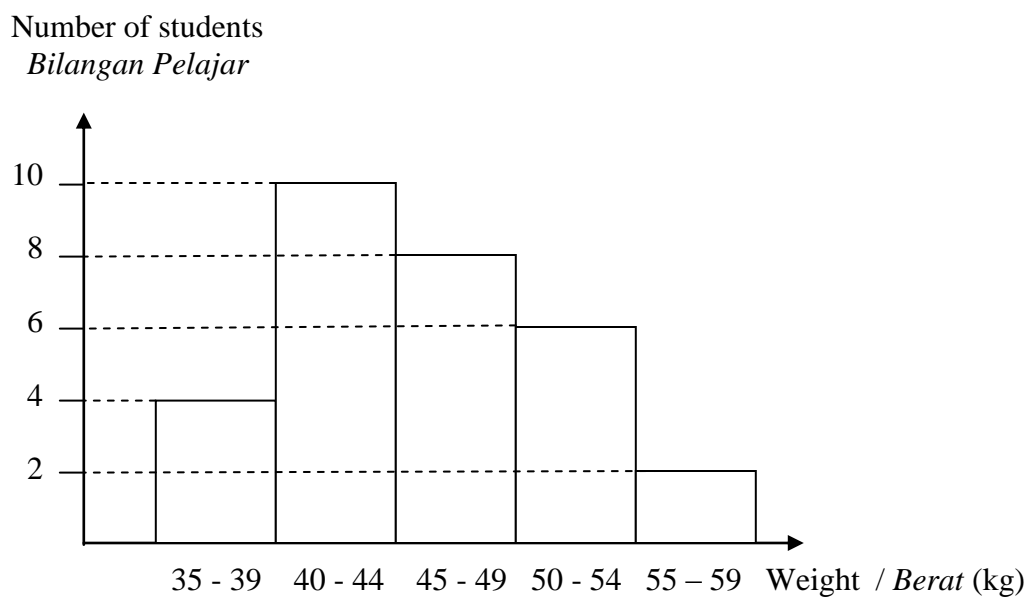


Diagram 12  
*Rajah 12*

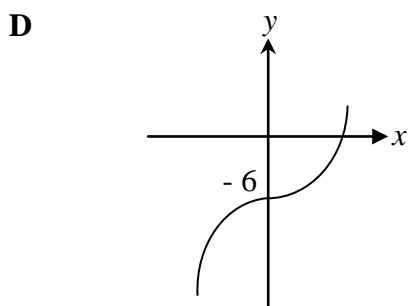
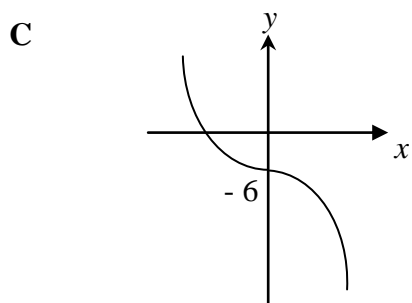
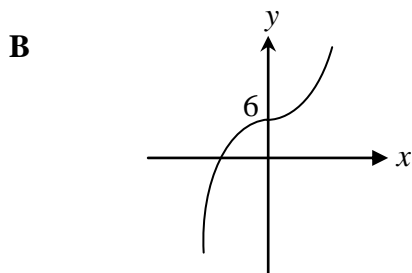
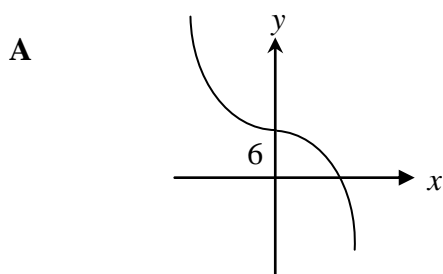
Calculate the percentage of students whose weight is more than 44 kg.

*Hitungkan peratus pelajar yang mempunyai berat lebih daripada 44 kg.*

- A 26.67
- B 33.33
- C 53.33
- D 86.67

29 Which of the following represents the graph of  $y = -\frac{1}{2}x^3 + 6$  ?

*Antara yang berikut, yang manakah mewakili graf  $y = -\frac{1}{2}x^3 + 6$  ?*



- 30 It is given that the universal set  $\xi = \{x : 2 \leq x \leq 30, x \text{ is an integer}\}$ , set  $H = \{x : x \text{ is a perfect square}\}$ , and set  $N = \{x : x \text{ is a multiple of 4}\}$ .

*Diberi set semesta  $\xi = \{x : 2 \leq x \leq 30, x \text{ ialah integer}\}$ , set  $H = \{x : x \text{ ialah kuasa dua sempurna}\}$ , dan set  $N = \{x : x \text{ ialah gandaan 4}\}$ .*

Find  $n(H' \cap N)$ .

*Carikan  $n(H' \cap N)$ .*

- A** 2  
**B** 5  
**C** 9  
**D** 20

- 31 Diagram 13 is a Venn diagram with the universal set,  $\xi = L \cup M \cup N$ .

*Rajah 13 ialah sebuah gambarajah Venn yang menunjukkan set semesta  $\xi = L \cup M \cup N$ .*

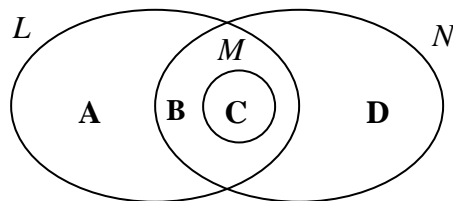


Diagram 13  
*Rajah 13*

Which of the region, **A**, **B**, **C** or **D**, represents set  $L \cap N \cap M'$  ?

*Rantau yang manakah **A**, **B**, **C** atau **D**, yang mewakili set  $L \cap N \cap M'$  ?*

32 Diagram 14 is a Venn diagram showing set  $\xi$ , set  $R$  and set  $S$ .

Rajah 14 ialah sebuah gambarajah Venn yang menunjukkan set  $\xi$ , set  $R$  dan set  $S$ .

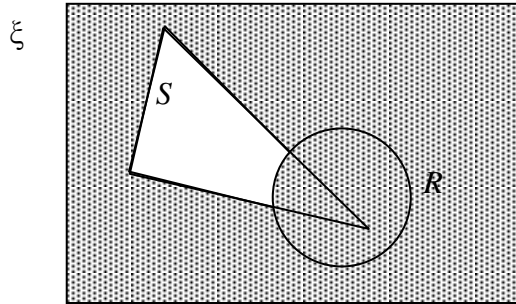


Diagram 14  
Rajah 14

Which of the following represents the shaded region?

Yang manakah mewakili rantau yang berlorek?

- A  $R \cup S'$
- B  $R \cap S'$
- C  $S \cup R'$
- D  $S \cap R'$



- 33 In Diagram 15,  $PQ$  is parallel to  $RS$ . The equation of the straight line  $RS$  is  $y = 2x - 7$ . The point  $F$  lies on the  $x$ -axis.

*Dalam Rajah 15,  $PQ$  dan  $RS$  adalah selari. Persamaan bagi garis lurus  $RS$  ialah  $y = 2x - 7$ . Titik  $F$  berada di atas paksi- $x$ .*

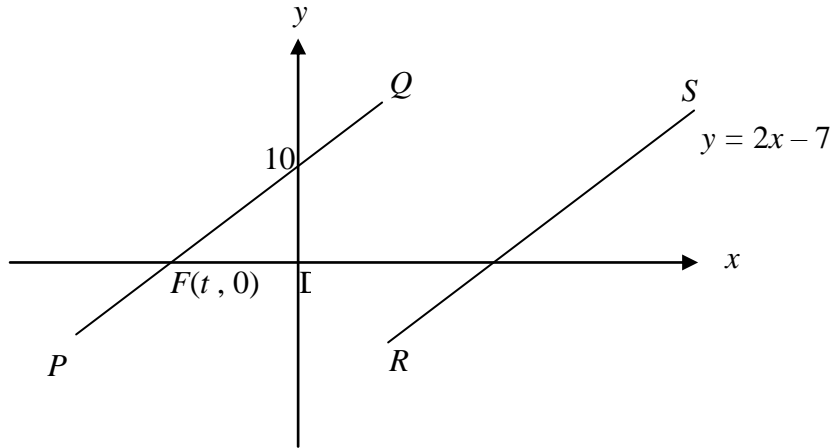


Diagram 15  
Rajah 15

Find the value of  $t$ .

*Cari nilai  $t$ .*

- A - 20  
B - 10  
C - 5  
D - 2.5
- 34 Find the equation of the straight line with the  $y$ -intercept of 5 and passes through  $P(6, -3)$ .

*Carikan persamaan garis lurus dengan pintasan- $y$  ialah 5 dan melalui  $P(6, -3)$ .*

- A  $y = -\frac{4}{3}x + 5$   
B  $y = \frac{4}{3}x + 5$   
C  $y = -\frac{3}{4}x + 5$   
D  $y = \frac{3}{4}x + 5$

- 35 Table 2 shows the number of stamps in an envelope. A stamp is taken out from the envelope randomly.

*Jadual 2 menunjukkan bilangan setem di dalam satu sampul surat. Sekeping setem dikeluarkan secara rawak daripada sampul surat itu.*

Stamp <i>Setem</i>	10 sen	20 sen	30 sen	50 sen
Number of stamps <i>Bilangan setem</i>	10	30	50	10

Table 2  
*Jadual 2*

Find the probability that the selected stamp is less than 50 sen.

*Carikan kebarangkalian bahawa setem yang dipilih itu kurang daripada 50 sen.*

- A  $\frac{1}{10}$
- B  $\frac{2}{5}$
- C  $\frac{1}{2}$
- D  $\frac{9}{10}$

**36** Zaid has a collection of coins from Britain, Indonesia and the Philippines.

He picks one coin at random. The probability of picking an Indonesian coin is  $\frac{1}{3}$

and the probability of picking a Philippine coin is  $\frac{4}{9}$ . Zaid has 10 British coins.

Calculate the total number of coins in his collection.

*Zaid mempunyai satu koleksi duit syiling dari negara Britain, Indonesia dan Filipina.*

*Dia memilih sekeping duit syiling secara rawak. Kebarangkalian memilih duit syiling*

*Indonesia ialah  $\frac{1}{3}$  dan kebarangkalian memilih duit syiling Filipina ialah  $\frac{4}{9}$ . Zaid*

*mempunyai 10 duit syiling British. Hitungkan jumlah bilangan duit syilingnya.*

**A** 30

**B** 35

**C** 45

**D** 70

**37** If  $t$  varies directly as the cube of  $s$  and  $t = 6$  when  $s = 2$ , calculate the value of  $s$  when  $t = 48$ .

*Jika  $t$  berubah secara langsung dengan kuasa tiga  $s$  dan  $t = 6$  apabila  $s = 2$ , hitungkan nilai  $s$  apabila  $t = 48$ .*

**A**  $\frac{3}{4}$

**B**  $\frac{4}{3}$

**C** 4

**D** 8

38 Table 3 shows the values of the variables  $u, v$  and  $w$  where  $u$  varies directly as the square of  $v$  and inversely as  $w$ .

*Jadual 3 menunjukkan nilai bagi pemboleh ubah  $u, v$  dan  $w$  dengan keadaan  $u$  berubah secara langsung dengan kuasa dua  $v$  dan berubah secara songsang dengan  $w$ .*

$u$	$v$	$w$
40	4	2
$r$	6	4

Table 3  
*Jadual 3*

Calculate the value of  $r$ .

*Hitungkan nilai bagi  $r$ .*

- A 12
- B 30
- C 45
- D 180

39 Given  $\begin{pmatrix} 7 \\ 2 \end{pmatrix} + \begin{pmatrix} 8 \\ 5n \end{pmatrix} = -3 \begin{pmatrix} -5 \\ 1 \end{pmatrix}$ , find the value of  $n$ .

*Diberi bahawa*  $\begin{pmatrix} 7 \\ 2 \end{pmatrix} + \begin{pmatrix} 8 \\ 5n \end{pmatrix} = -3 \begin{pmatrix} -5 \\ 1 \end{pmatrix}$ , *cari nilai*  $n$ .

A  $-5$

B  $-1$

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

D  $\frac{1}{5}$

40 Given  $\begin{pmatrix} 4 & m \\ 5 & -2 \end{pmatrix} \begin{pmatrix} m \\ -1 \end{pmatrix} = \begin{pmatrix} -9 \\ -13 \end{pmatrix}$ , find the value of  $m$ .

*Diberi*  $\begin{pmatrix} 4 & m \\ 5 & -2 \end{pmatrix} \begin{pmatrix} m \\ -1 \end{pmatrix} = \begin{pmatrix} -9 \\ -13 \end{pmatrix}$ , *cari nilai*  $m$ .

A  $-3$

B  $-\frac{9}{5}$

C  $-\frac{1}{3}$

D  $\frac{3}{2}$

**END OF QUESTION PAPER**

***KERTAS SOALAN TAMAT***

**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 biasa digunakan.*

**RELATIONS**  
**PERKAITAN**

- |   |   |
|---|---|
| <p>1 <math>a^m \times a^n = a^{m+n}</math></p>  | <p>10 Pythagoras Theorem<br/><i>Teorem Pithagoras</i><br/><math>c^2 = a^2 + b^2</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>11 <math>P(A) = \frac{n(A)}{n(S)}</math></p>   |
| <p>4 <math>A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d &amp; -b \\ -c &amp; a \end{pmatrix}</math></p>   | <p>12 <math>P(A') = 1 - P(A)</math></p>   |
| <p>5 Distance / <i>Jarak</i><br/><math display="block">= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}</math></p>  | <p>13 <math>m = \frac{y_2 - y_1}{x_2 - x_1}</math></p>  |
| <p>6 Midpoint / <i>Titik tengah</i><br/><math display="block">\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)</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> |
| <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/><br/><math>Min = \frac{\text{hasil tambah nilai data}}{\text{bilangan data}}</math></p>   |   |
| <p>9 Mean = <math>\frac{\text{sum of (classmark} \times \text{frequency)}}{\text{sum of frequencies}}</math><br/><br/><math>Min = \frac{\text{hasil tambah (nilai titik tengah kelas} \times \text{kekerapan)}}{\text{hasil tambah kekerapan}}</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 keraain 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 pyramid tegak =  $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$*
- 11 Sum of interior angles of a polygon  
*Hasil tambah sudut pedalaman polygon*  
 =  $(n - 2) \times 180^\circ$

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

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

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

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

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

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

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



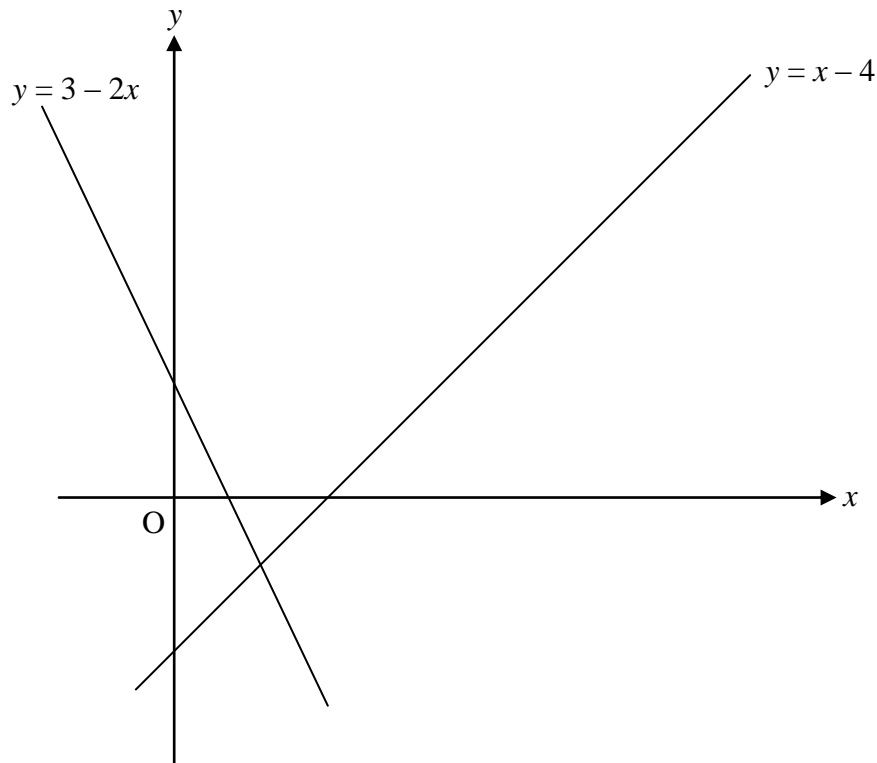
**Section A**  
**Bahagian A**[ 52 marks ]  
[ 52 markah ]

- 1 On the graph provided, shade the region which satisfies the three inequalities  $y \geq x - 4$ ,  $y \leq 3 - 2x$  and  $y < 5$ .

*Pada graf yang disediakan, lorekkan rantau yang memuaskan ketiga-tiga ketaksamaan  $y \geq x - 4$ ,  $y \leq 3 - 2x$  dan  $y < 5$ .*

[ 3 marks ]  
[ 3 markah ]

Answer / Jawapan :



- 2** Calculate the value of  $v$  and of  $w$  that satisfy the following simultaneous linear equations.

*Hitungkan nilai  $v$  dan nilai  $w$  yang memuaskan persamaan serentak berikut.*

$$\begin{aligned}2w - 3v &= 4 \\ w - \frac{1}{3}v &= -5\end{aligned}$$

[ 4 marks ]  
[ 4 markah ]

Answer / Jawapan :

- 3** Solve the following quadratic equation:

*Selesaikan persamaan kuadratik berikut:*

$$7x = (2x + 3)(1 - 2x)$$

[ 4 marks ]  
[ 4 markah ]

Answer / Jawapan :

- 4 Diagram 1 shows a right prism. The base  $STU$  is a right angled triangle. The triangle  $STU$  is the uniform cross section of the prism.  $W$  is the midpoint of  $TU$ .

*Rajah 1 menunjukkan sebuah prisma tegak. Tapak prisma adalah segitiga  $STU$  yang bersudut tegak. Segitiga  $STU$  adalah keratan rentas seragam prisma itu.  $W$  adalah titik tengah garis  $TU$ .*

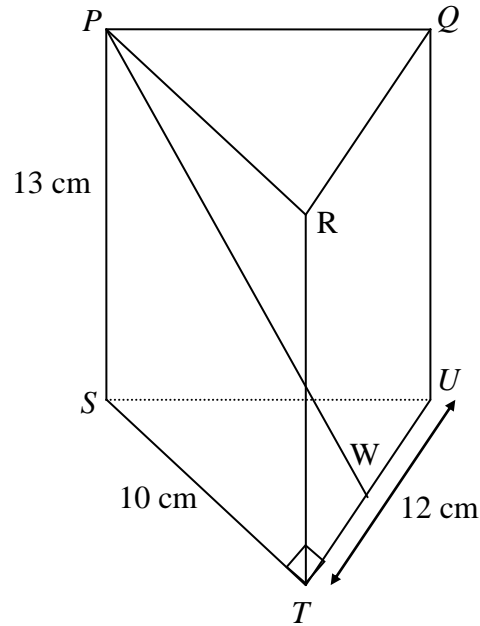


Diagram 1  
Rajah 1

Calculate the angle between the line  $PW$  and the base  $STU$ .

*Hitungkan sudut antara garis  $PW$  dan satah  $STU$*

[ 4 marks ]

[ 4 markah ]

Answer / Jawapan :

- 5 Diagram 2 shows a trapezium  $PQRS$ . The equation of the straight line  $RS$  is  $y - 2x = 10$  and equation of the straight line  $PS$  is  $y = 4x + 40$ .

*Rajah 2 menunjukkan sebuah trapezium PQRS. Persamaan garis lurus RS ialah  $y - 2x = 10$  dan persamaan garis lurus PS ialah  $y = 4x + 40$ .*

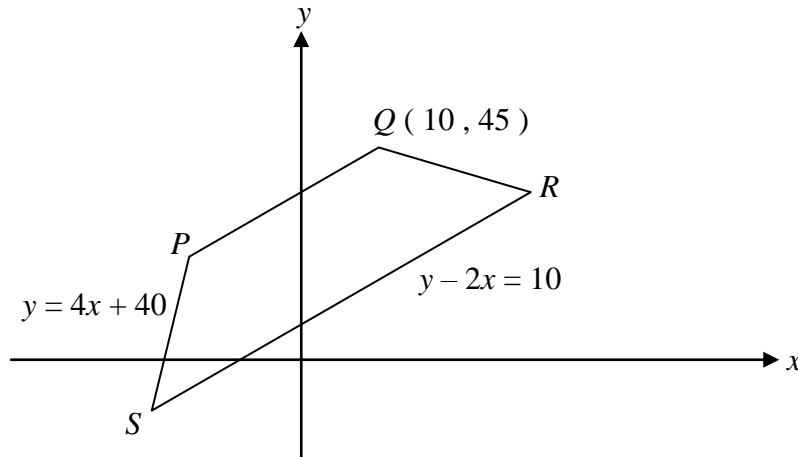


Diagram 2  
*Rajah 2*

Find

*Cari*

- (a) the  $x$ -intercept of line  $SR$ .  
*pintasan- $x$  bagi garis lurus  $SR$ .*
- (b) the equation of the straight line  $PQ$ .  
*persamaan garis lurus  $PQ$ .*
- (c) the coordinates of point  $S$ .  
*koordinat titik  $S$ .*

[ 5 marks ]  
[ 5 markah ]

Answer / Jawapan :

(a)

(b)

(c)

- 6 Diagram 3 shows a semicircle  $ORT$  with centre  $S$ .  $OPQ$  is a sector of a circle with centre  $O$ .

*Rajah 3 menunjukkan semibulatan  $ORT$  berpusat  $S$ .  $OPQ$  adalah sektor bulatan berpusat  $O$ .*

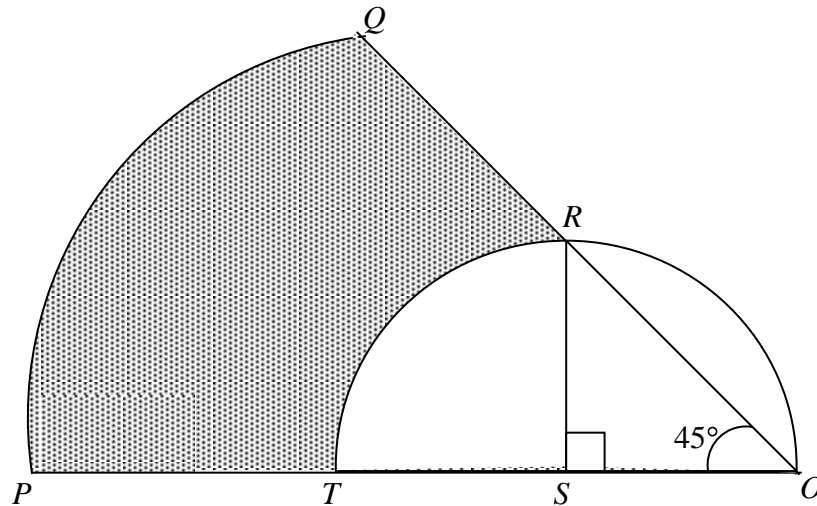


Diagram 3  
*Rajah 3*

Given that  $PT = TS = 6$  cm .

*Di beri  $PT = TS = 6$  cm.*

[ Use / Guna  $\pi = \frac{22}{7}$  ]

Calculate

*Hitungkan*

- (a) the perimeter, in cm, of the whole diagram.

*perimeter, dalam cm, seluruh rajah itu.*

- (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)

- 7 (a) Combine the two statements below to form a **true** statement.

*Gabungkan dua pernyataan di bawah menjadi satu pernyataan **benar**.*

Statement 1 : 6 is a factor of 20.

*Pernyataan 1 : 6 ialah faktor bagi 20.*

Statement 2 :  $2^3 = 8$ .

*Pernyataan 2 :  $2^3 = 8$ .*

- (b) Complete the following argument :

*Lengkapkan hujah berikut :*

Premise 1 : All quadrilaterals have 2 diagonals.

*Premis 1 : Semua sisiempat mempunyai dua pepenjuru.*

Premise 2 :

*Premis 2 : .....*

Conclusion : *PQRS* has 2 diagonals.

*Kesimpulan : PQRS mempunyai 2 pepenjuru.*

- (c) Make a general conclusion by induction for the sequence of numbers 1, 22, 79, 190, ... which follows the pattern:

*Bina satu kesimpulan umum secara aruhan bagi turutan nombor 1, 22, 79, 190, ... yang mengikut pola berikut:*

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

$$22 = 3(2)^3 - 2$$

$$79 = 3(3)^3 - 2$$

$$190 = 3(4)^3 - 2$$

$$\dots = \dots$$

[ 5 marks ]

[ 5 markah ]



Answer / Jawapan :

(a) .....  
.....

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

(c) .....  
.....

- 8 Table 1 shows the result of a survey. The survey is on the mode of transport to SMK Jalan Baru on a particular day involving 200 students.

*Jadual 1 menunjukkan hasil suatu kajian. Kajian tersebut adalah tentang penggunaan kenderaan ke SMK Jalan Baru pada suatu hari tertentu yang melibatkan 200 orang pelajar.*

	<b>Boys</b> <i>Lelaki</i>	<b>Girls</b> <i>Perempuan</i>
<b>Bus</b> <i>Bas</i>	20	45
<b>Car</b> <i>Kereta</i>	18	22
<b>Bicycle</b> <i>Basikal</i>	59	36

Table 1  
*Jadual 1*

- (a) If a student is selected at random, find the probability that the student went to school by car .

*Jika seorang pelajar dipilih secara rawak, cari kebarangkalian bahawa pelajar tersebut pergi ke sekolah dengan menaiki kereta.*

- (b) If two girls are selected at random, find the probability that both girls went to school by bicycle.

*Jika dua orang pelajar perempuan dipilih secara rawak, cari kebarangkalian bahawa kedua-duanya pergi ke sekolah dengan basikal.*

- (c) If two students are selected at random, find the probability that both of them use the same mode of transport to school.

*Jika dua orang pelajar dipilih secara rawak, cari kebarangkalian bahawa kedua-duanya menggunakan jenis kenderaan yang sama untuk ke sekolah.*

[ 5 marks ]  
[ 5 markah ]

Answer / *Jawapan* :

(a)

(b)

(c)

9 (a) If  $k \begin{pmatrix} -4 & -1 \\ 5 & 2 \end{pmatrix} \begin{pmatrix} 2 & 1 \\ n & -4 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ , find the value of  $k$  and of  $n$ .

Jika  $k \begin{pmatrix} -4 & -1 \\ 5 & 2 \end{pmatrix} \begin{pmatrix} 2 & 1 \\ n & -4 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ , hitungkan nilai  $k$  dan nilai  $n$ .

(b) Write the following simultaneous linear equations as a matrix equation.

*Tulis persamaan linear berikut dalam bentuk persamaan matriks.*

$$-4x - y = 9$$

$$5x + 2y = 15$$

Hence, calculate the value of  $x$  and of  $y$  using matrices.

*Seterusnya, dengan menggunakan kaedah matriks, hitungkan nilai  $x$  dan nilai  $y$ .*

[ 6 marks ]

[ 6 markah ]

Answer / *Jawapan*:

(a)

(b)

10 Diagram 4 shows the speed-time graph of a particle for a period of 14 seconds.

Rajah 4 menunjukkan graf laju- masa bagi suatu zarah dalam tempoh 14 saat.

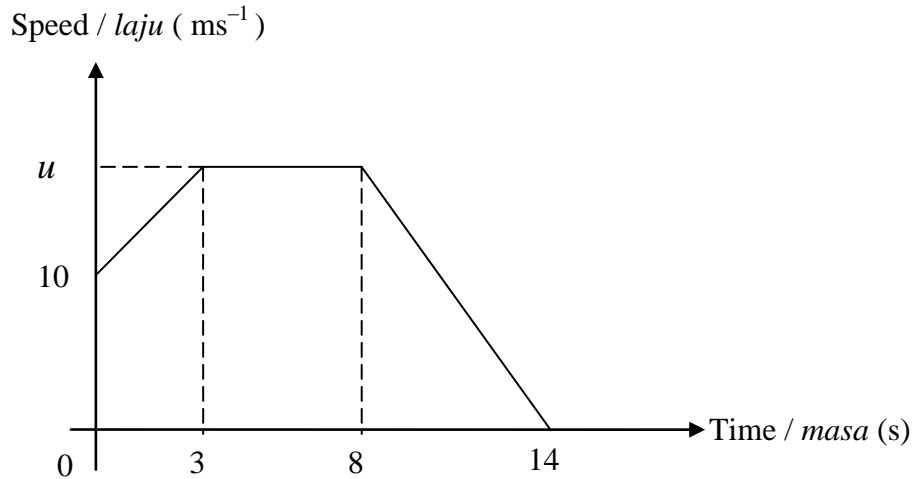


Diagram 4  
Rajah 4

- (a) If the total distance travelled by the particle in the last 6 seconds is 90 m, find the value of  $u$ .

*Jika jumlah jarak yang dilalui oleh zarah itu dalam 6 saat yang terakhir ialah 90 m, cari nilai bagi  $u$ .*

- (b) Calculate the rate of change of the speed, in  $\text{ms}^{-2}$ , of the particle when  $t = 10$  second.

*Hitungkan kadar perubahan laju, dalam  $\text{ms}^{-2}$ , apabila  $t = 10$  saat.*

- (c) Calculate the average speed of the particle, in  $\text{ms}^{-1}$ , for the first 8 seconds.

*Hitungkan purata laju, dalam  $\text{ms}^{-1}$ , zarah itu untuk 8 saat yang pertama.*

[ 6 marks ]

[ 6 markah ]

Answer / *Jawapan* :

(a)

(b)

(c)

- 11 Diagram 5 shows a solid in the form of a hemisphere from which a right circular cone is removed. The diameter of the cone and the diameter of the hemisphere is 14 cm. The height of the cone is 6 cm.

*Rajah 5 menunjukkan pepejal berbentuk hemisfera di mana sebuah kon tegak dikeluarkan. Diameter kon dan diameter hemisfera ialah 14 cm. Tinggi kon ialah 6 cm.*

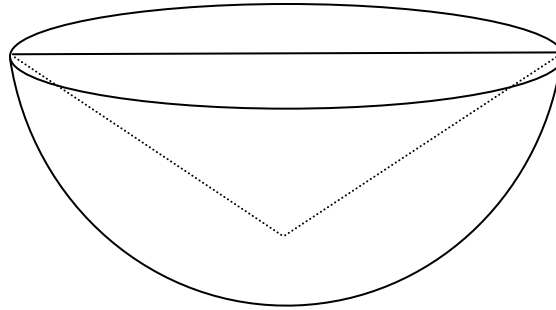


Diagram 5  
Rajah 5

Calculate the volume, in  $\text{cm}^3$ , of the remaining solid.

*Hitungkan isipadu, dalam  $\text{cm}^3$ , pepejal yang tinggal.*

$$\left( \text{Use / Guna } \pi = \frac{22}{7} \right)$$

[ 4 marks ]

[ 4 markah ]



*Answer/ Jawapan :*

**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 Table 2 in the answer space for the equation  $y = -x^3 + 8x - 6$  by writing down the values of  $y$  when  $x = -4$  and  $x = 3$ .

Lengkapkan Jadual 2 di ruang jawapan bagi persamaan  $y = -x^3 + 8x - 6$  dengan menulis nilai-nilai  $y$  apabila  $x = -4$  dan  $x = 3$ .

[ 2 marks ]

[ 2 markah ]

- (b) For this part of the question, use the graph paper provided on page 25. You may use a flexible curve ruler.

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan pada halaman 25. 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  $y = -x^3 + 8x - 6$  for  $-4 \leq x \leq 3.5$ .

Dengan menggunakan skala 2 cm kepada 1 unit pada paksi- $x$  dan 2 cm kepada 5 unit pada paksi- $y$ , lukiskan graf  $y = -x^3 + 8x - 6$  bagi  $-4 \leq x \leq 3.5$ .

[ 4 marks ]

[ 4 markah ]

- (c) From your graph, find

Daripada graf anda, cari

- (i) the value of  $y$  when  $x = -2.5$   
nilai  $y$  apabila  $x = -2.5$

- (ii) the value of  $x$  when  $y = 15$   
nilai  $x$  apabila  $y = 15$

[ 2 marks ]

[ 2 markah ]

- (d) Draw a suitable straight line on your graph to find the values of  $x$  which satisfy the equation  $x^3 = 10x - 10$  for  $-4 \leq x \leq 3.5$ . State these values of  $x$ .

Lukiskan satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai  $x$  yang memuaskan persamaan  $x^3 = 10x - 10$  bagi  $-4 \leq x \leq 3.5$ . Nyatakan nilai-nilai  $x$  itu.

[ 4 marks ]

[ 4 markah ]

Answer / Jawapan :

(a)

$x$	-4	-3	-2	-1	0	1	2	3	3.5
$y$		-3	-14	-13	-6	1	2		-20.9

Table 2  
Jadual 2

(b) Refer graph on page 25.

*Rujuk graf di halaman 25.*(c) (i)  $y = \dots\dots\dots$ (ii)  $x = \dots\dots\dots$ (d)  $x = \dots\dots\dots, \dots\dots\dots, \dots\dots\dots$

**BLANK PAGE**  
***HALAMAN KOSONG***

**SULIT**

**25**

**1449/2**

*For  
Examiner's  
Use*

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

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

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

- (a) Diagram 6 (i) shows a solid in the shape of a right prism with a rectangular base  $ABCD$  on a horizontal plane. The surface  $ABGFE$  is the uniform cross-section of the solid. Rectangle  $FGHJ$  is an inclined plane and rectangle  $EFJK$  is a horizontal plane. Edges  $AE$ ,  $BG$ ,  $CH$  and  $DK$  are vertical.

*Rajah 6 (i) menunjukkan pepejal berbentuk prisma dengan tapak segiempat tepat  $ABCD$  terletak di atas satah mengufuk. Permukaan  $ABGFE$  ialah keratan rentas seragam bagi pepejal itu. Segiempat tepat  $FGHJ$  ialah satah condong dan segiempat tepat  $EFJK$  ialah satah mengufuk. Sisi  $AE$ ,  $BG$ ,  $CH$  dan  $DK$  adalah tegak.*

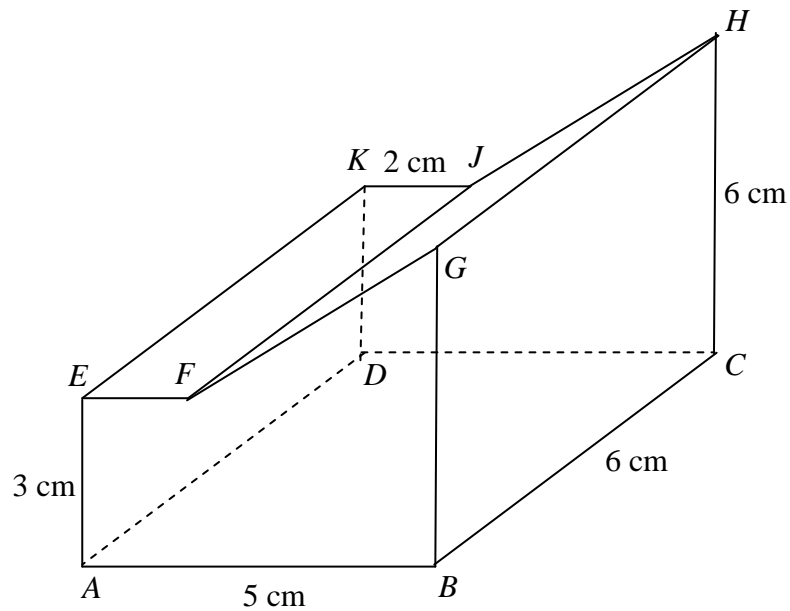


Diagram 6 (i)  
Rajah 6 (i)

Draw to full scale, the elevation of the solid on a 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  $X$ .*

[ 3 marks ]

[ 3 markah ]

Answer / Jawapan :

(a)





- (ii) the elevation of the combined solid on a vertical plane parallel to  $BC$  as viewed from  $Y$ .

*Dongakan gabungan pepejal itu pada satah mencancang yang selari dengan  $BC$  sebagaimana dilihat dari  $Y$ .*

[ 5 marks ]

[ 5 markah ]

Answer / Jawapan :

- (b) (i) , (ii)

- 14  $K ( 50^{\circ}S , 30^{\circ}E )$  ,  $L ( 50^{\circ}S , 90^{\circ}W )$  and  $M$  are three points on the surface of the earth.  $KM$  is the diameter of its parallel of latitude.

$K ( 50^{\circ}S , 30^{\circ}T )$  ,  $L ( 50^{\circ}S , 90^{\circ}B )$  dan  $M$  adalah tiga titik yang berada di permukaan bumi.  $KM$  ialah diameter selarian latitud.

- (a) (i) State the longitude of  $M$ .  
*Nyatakan longitud bagi  $M$ .*
- (ii) Find the ratio of the distance from  $K$  to  $L$  to the distance from  $L$  to  $M$  measured along the common parallel of latitude.  
*Cari nisbah jarak dari  $K$  ke  $L$  kepada jarak dari  $L$  ke  $M$  diukur sepanjang selarian latitud sepunya.*
- (iii) Calculate the shortest distance, in nautical miles, from  $K$  to  $M$  measured along the surface of the earth.  
*Hitungkan jarak terdekat, dalam batu nautika, dari  $K$  ke  $M$  diukur sepanjang permukaan bumi.*
- (iv) Calculate the distance in nautical miles from  $M$  to the east to  $L$  measured along the common parallel of latitude.  
*Hitungkan jarak, dalam batu nautika, dari  $M$  ke timur ke  $L$  diukur sepanjang selarian latitud sepunya.*

[ 8 marks ]

[ 8 markah ]

- (b) An aeroplane with speed 540 knots flew from  $K$  due west to point  $L$ . The plane then flew due north to the point  $T$ .  $T$  is 2400 nautical miles north of  $L$ .

*Sebuah kapal terbang dengan kelajuan 540 knot terbang dari  $K$  ke arah barat hingga sampai di  $L$ . Kemudian kapal terbang itu terbang ke arah utara hingga sampai ke  $T$ .  $T$  terletak 2400 batu nautika ke utara  $L$ .*

Calculate

*Hitungkan*

- (i) latitude of  $T$ .  
*latitud bagi  $T$ .*
- (ii) time taken, in hours, for the whole journey  
*Masa diambil, dalam jam, keseluruhan penerbangan itu.*

[ 4 marks ]

[ 4 markah ]

Answer / Jawapan :

(a) (i)

(ii)

(iii)

(iv)

(b) (i)

(ii)

- 15 (a) Transformation **P** is a reflection in the line  $x = -1$  and transformation **R** is a rotation of  $90^\circ$  clockwise about point  $(1, 2)$

*Penjelmaan **P** adalah pantulan pada garis lurus  $x = -1$  dan penjelmaan **R** adalah putaran  $90^\circ$  ikut arah jam pada pusat  $(1, 2)$ .*

- (i) State the coordinates of the image of point  $M(-2, 5)$  under the combined transformations **RP**

*Nyatakan koordinat imej bagi titik  $M(-2, 5)$  di bawah gabungan penjelmaan **RP**.*

- (ii) If the point  $S(-2, 1)$  is the image of point  $T(x, y)$  under the transformation **PR**, state the value of  $x$  and of  $y$ .

*Jika titik  $S(-2, 1)$  adalah imej titik  $T(x, y)$  di bawah penjelmaan **PR**, nyatakan nilai  $x$  dan nilai  $y$ .*

[ 4 marks ]

[ 4 markah ]

- (b) Diagram 7 shows trapeziums  $EFGJ$ ,  $KLGN$  and  $ABCD$  on a Cartesian plane.

Rajah 7 menunjukkan trapezium  $EFGJ$ ,  $KLGN$  dan  $ABCD$  pada satah Cartesian.

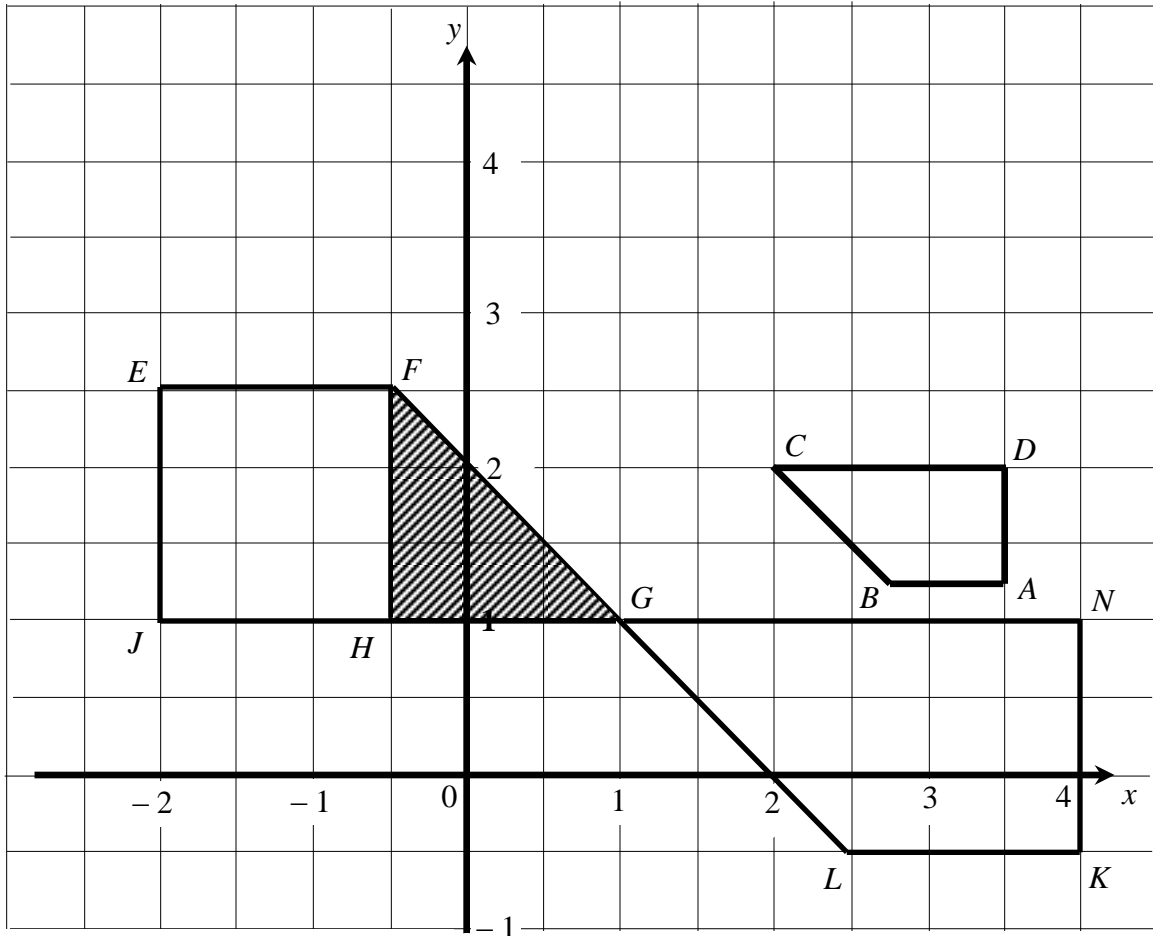


Diagram 7  
Rajah 7

$EFGJ$  is the image of  $KLGN$  under transformation  $V$  and  $ABCD$  is the image of  $KLGN$  under transformation  $W$ .

$EFGJ$  ialah imej bagi  $KLGN$  di bawah penjelmaan  $V$  dan  $ABCD$  ialah imej bagi  $KLGN$  di bawah penjelmaan  $W$ .

- (i) Describe in full  
*Huraikan selengkapnya*
- the transformation  $V$ ,  
*penjelmaan  $V$ ,*
  - the transformation  $W$ .  
*penjelmaan  $W$ .*

[Lihat sebelah  
SULIT

**BLANK PAGE**  
***HALAMAN KOSONG***

- (ii) The ratio of the area of triangle  $FGH$  to the area of the square  $EFHJ$  is  $1 : 2$ . Given the area of  $ABCD$  is  $36 \text{ cm}^2$ , calculate the area, in  $\text{cm}^2$ , of the triangle  $FGH$ .

*Nisbah luas segitiga  $FGH$  kepada luas segiempat sama  $EFHJ$  adalah  $1 : 2$ . Diberi luas  $ABCD$  ialah  $36 \text{ cm}^2$ , hitungkan luas, dalam  $\text{cm}^2$ , segitiga  $FGH$ .*

[ 8 marks ]

[ 8 markah ]

Answer / Jawapan :

(a) (i)

(ii)

(b) (i) a)

b)

(ii)

16 The data in Diagram 8 shows the marks of 60 students in a Mathematics test.

*Data dalam Rajah 8 menunjukkan markah ujian Matematik bagi 60 orang pelajar.*

42	48	54	41	52	49	60	45	40	49
67	51	47	54	42	57	58	41	47	51
55	44	37	51	57	40	51	41	46	48
55	69	52	45	45	52	53	50	46	58
62	58	51	54	57	46	56	60	57	50
44	50	50	55	55	63	63	61	37	46

Diagram 8  
*Rajah 8*

(a) Using the data in Diagram 8, complete Table 3 in the answer space.

*Menggunakan data dalam Rajah 8, lengkapkan Jadual 3 pada ruang jawapan.*

[ 4 marks ]

[ 4 markah ]

(b) For this part of the question, use the graph paper provided on page 39.

*Untuk ceraiian soalan ini, gunakan kertas graf yang disediakan di halaman 39.*

By using the scale of 2 cm to 5 marks on the  $x$ -axis and 2 cm to 5 students on the  $y$ -axis, draw an ogive for the data.

*Dengan menggunakan skala 2 cm kepada 5 markah pada paksi- $x$  dan 2 cm kepada 5 orang pelajar pada paksi- $y$ , lukiskan ogif bagi data tersebut.*

[ 4 marks ]

[ 4 markah ]

(c) Based on the ogive in (b), find

*Berdasarkan ogif di (b), cari*

(i) the median,  
*median,*

(ii) the lowest mark for grade A if the teacher decides to award grade A to 10% of the students.

*markah terendah untuk gred A jika guru menetapkan hanya 10% pelajar mendapat gred A.*

[ 4 marks ]

[ 4 markah ]



Answer / Jawapan :

- (a) Complete the table below .  
*Lengkapkan jadual di bawah .*

Marks <i>Markah</i>	Frequency <i>Kekerapan</i>	Cumulative frequency <i>Kekerapan longgokan</i>	Upper boundary <i>Sempadan atas</i>
30 – 34	0	0	
35 – 39	2		
40 – 44	9		
45 – 49	13		
50 – 54	16		
55 – 59	12		
60 – 64			
65 – 69			

- (b) Refer graph on page 39.  
*Rujuk graf di halaman 39.*
- (c) (i)

(ii)

**BLANK PAGE**  
***HALAMAN KOSONG***

**SULIT**

**39**

**1449/2**

*For  
Examiner's  
Use*

**Graph for Question 16**  
***Graf untuk Soalan 16***

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