1 Round off 35 086 correct to four significant figures.
Bundarkan 35 086 betul kepada empat angka bererti.

A 3 508

B 3 509

C 35 080

D 35 090

2 Express $5{\cdot}307 \times 10^{-3}$ as a single number.
Ungkapkan $5{\cdot}307 \times 10^{-3}$ *sebagai satu nombor tunggal.*

A 0·005307

B 5 307

C 53 070

D 530 700

3 Calculate $\frac{0{\cdot}0002657 \times 0{\cdot}64}{4{\cdot}3 \times 10^{-3}}$ and express the answer in standard form.

Hitung $\frac{0{\cdot}0002657 \times 0{\cdot}64}{4{\cdot}3 \times 10^{-3}}$ *dan ungkapkan jawapan dalam bentuk piawai.*

A $3{\cdot}954 \times 10^{-4}$

B $3{\cdot}954 \times 10^{-3}$

C $3{\cdot}954 \times 10^{-2}$

D $3{\cdot}954 \times 10^{-1}$

4 A lorry carries 1 200 boxes of strawberry where each box contains 2 550 strawberries.
Find the number of strawberries carried by the lorry.

Sebuah lori membawa 1 200 kotak strawberi di mana setiap kotak mengandungi 2 550 biji strawberi.
Cari bilangan strawberi yang dibawa oleh lori itu.

A $3{\cdot}06 \times 10^{6}$

B $3{\cdot}6 \times 10^{6}$

C $3{\cdot}06 \times 10^{7}$

D $3{\cdot}6 \times 10^{7}$

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5 Express $5^4 + 3 \times 5^2 + 1$ as a number in base five.
Ungkapkan $5^4 + 3 \times 5^2 + 1$ *sebagai satu nombor dalam asas lima.*

A 5031_5

B 5310_5

C 13010_5

D 10301_5

6 Calculate $10011_2 + 11_2$ and give the answer as a number in base five.
Hitung $10011_2 + 11_2$ *dan berikan jawapan sebagai satu nombor dalam asas lima.*

A 41_5

B 42_5

C 43_5

D 44_5

7 In Diagram 1, *TUVS* is a parallelogram and *PQRST* is a regular pentagon.
Dalam Rajah 1, *TUVS ialah sebuah segi empat selari dan PQRST adalah pentagon sekata.*

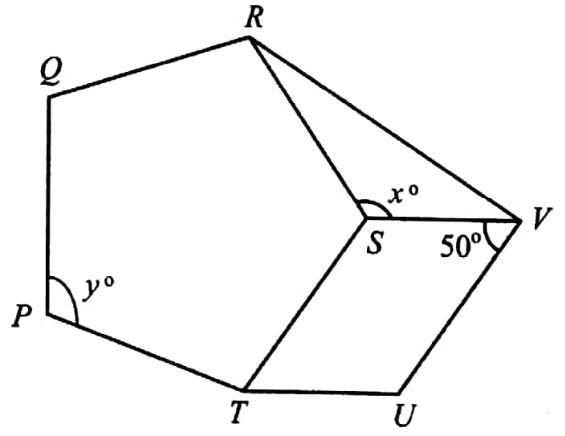

Diagram 1
Rajah 1

Find the value of $x - y$.
Cari nilai $x - y$.

A 12

B 13

C 14

D 15

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8 In Diagram 2, *ABC* is a straight line.
Dalam Rajah 2, ABC adalah garis lurus.

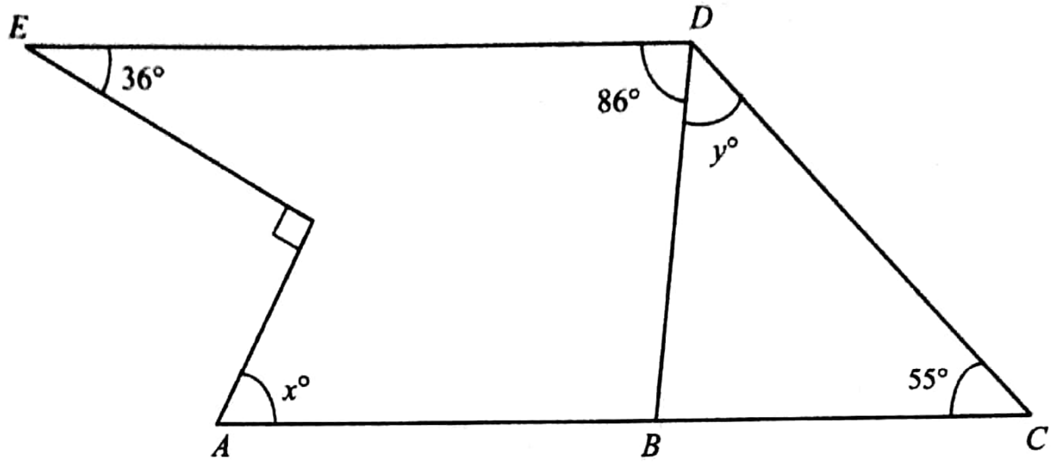

Diagram 2
Rajah 2

Find the value of $x + y$.
Cari nilai $x + y$.

A 54

B 93

C 144

D 183

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9 In Diagram 3, O is the centre of the circle and UTV is a tangent to the circle at T.
Dalam Rajah 3, O ialah pusat bulatan dan UTV ialah tangen kepada bulatan di T.

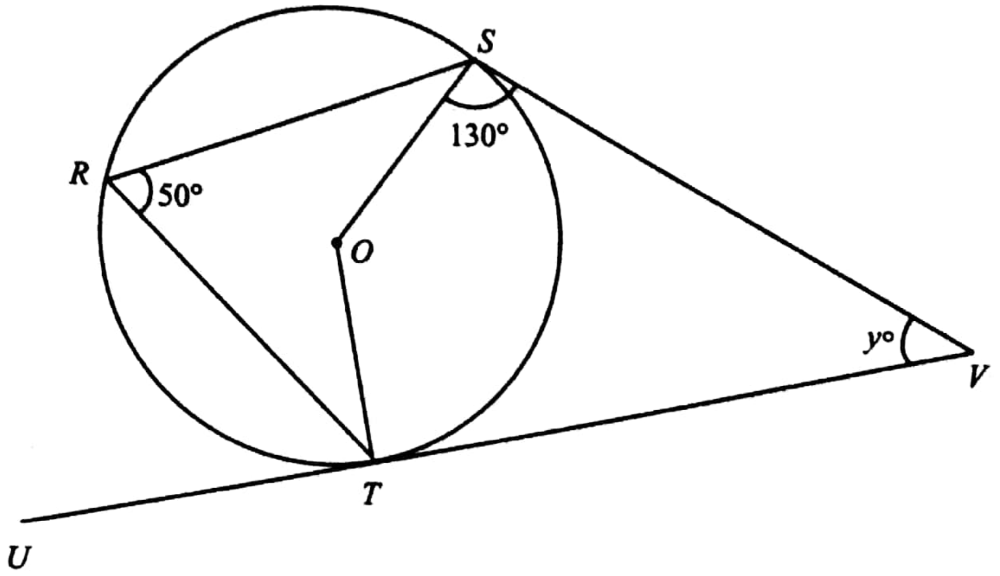

Diagram 3
Rajah 3

Find the value of y.
Cari nilai y.

A 35

B 40

C 50

D 60

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10 Diagram 4 shows five pentagons, P, **A**, **B**, **C** and **D** drawn on a square grid.
Rajah 4 menunjukkan lima pentagon P, **A**, **B**, **C** *dan* **D** *dilukis pada grid segi empat sama.*

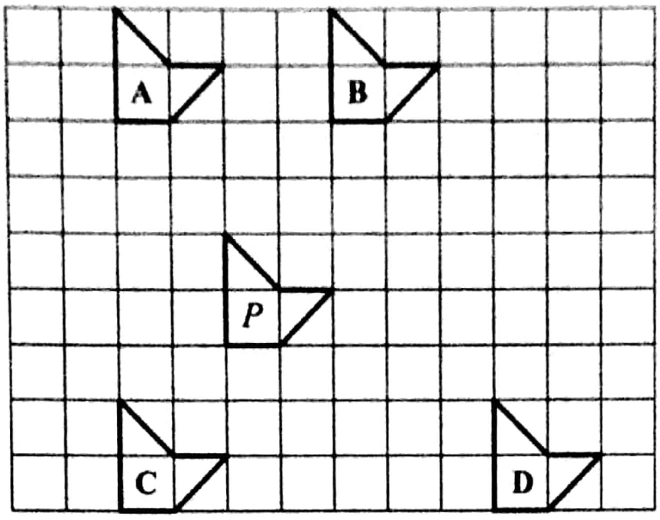

Diagram 4
Rajah 4

Which of the pentagons, **A**, **B**, **C** or **D**, is the image of pentagon P under the translation $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$?

Antara pentagon, **A**, **B**, **C** *dan* **D**, *yang manakah imej bagi pentagon P di bawah translasi* $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$?

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11 Diagram 5 shows $FG'H'J'E'$ and $FGHJE$, drawn on a square grid.
Rajah 5 menunjukkan $FG'H'J'E'$ dan $FGHJE$, dilukis pada grid segi empat sama.

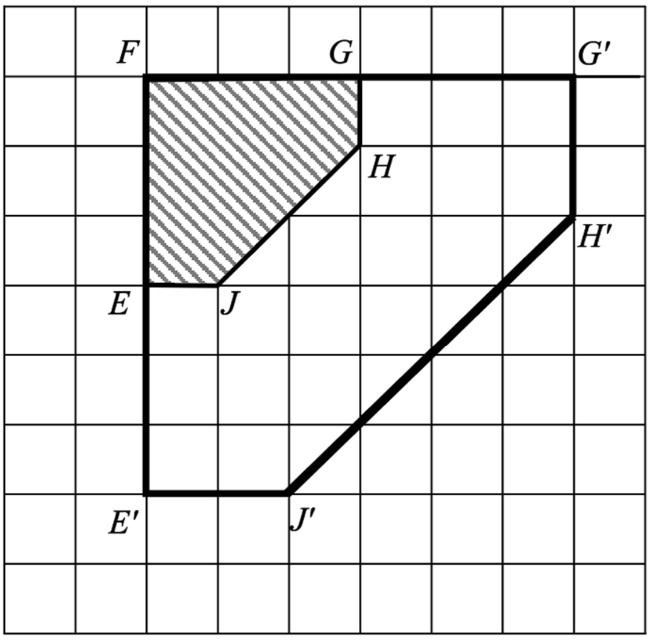

Diagram 5
Rajah 5

$FG'H'J'E'$ is the image of $FGHJE$ under an enlargement about the centre F with a scale factor of k.
State the value of k.

$FG'H'J'E'$ ialah imej bagi $FGHJE$ di bawah suatu pembesaran pada pusat F dengan faktor skala k.
Nyatakan nilai k.

A −2

B −3

C 2

D 3

12 Diagram 6 shows the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$.
Rajah 6 menunjukkan graf $y = \text{kos } x$ *bagi* $0^\circ \leq x \leq 360^\circ$.

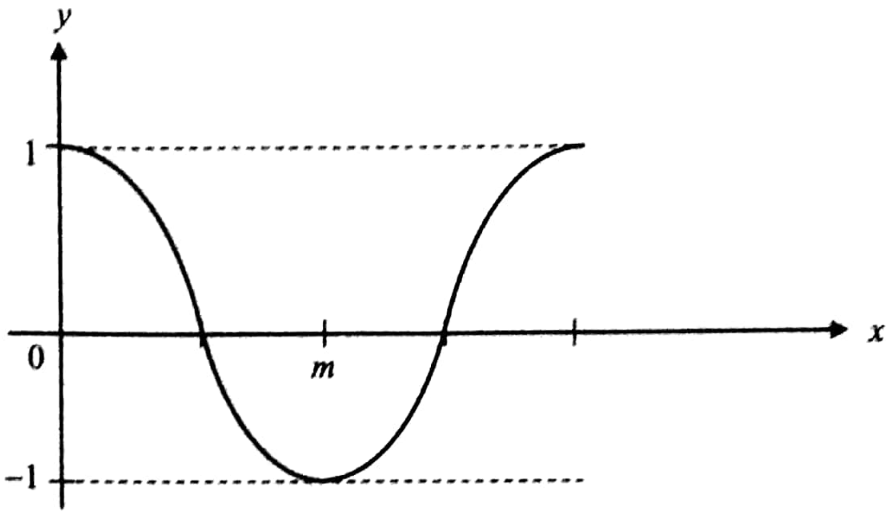

Diagram 6
Rajah 6

The value of *m* is
Nilai bagi m ialah

A 90°

B 180°

C 270°

D 360°

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13 In Diagram 7, *NOP* is a straight line.

Dalam Rajah 7, NOP adalah satu garis lurus.

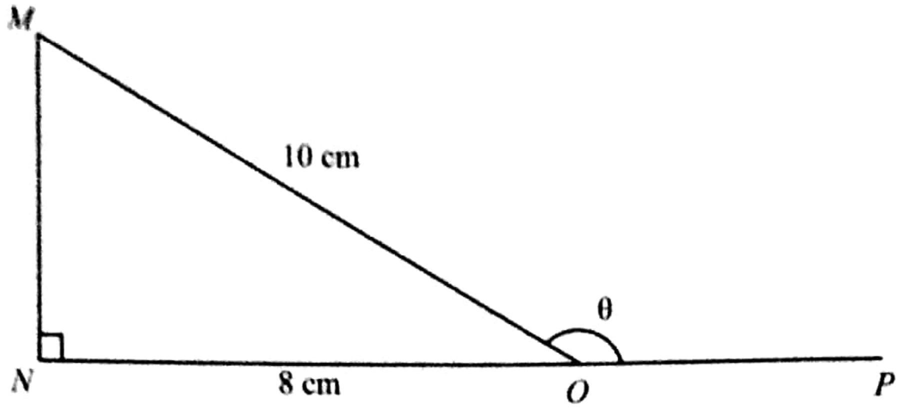

Diagram 7
Rajah 7

Find the value of sin θ.

Cari nilai sin θ.

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

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

C $\frac{3}{4}$

D $\frac{3}{5}$

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14 Diagram 8 shows a cuboid.
Rajah 8 menunjukkan sebuah kuboid.

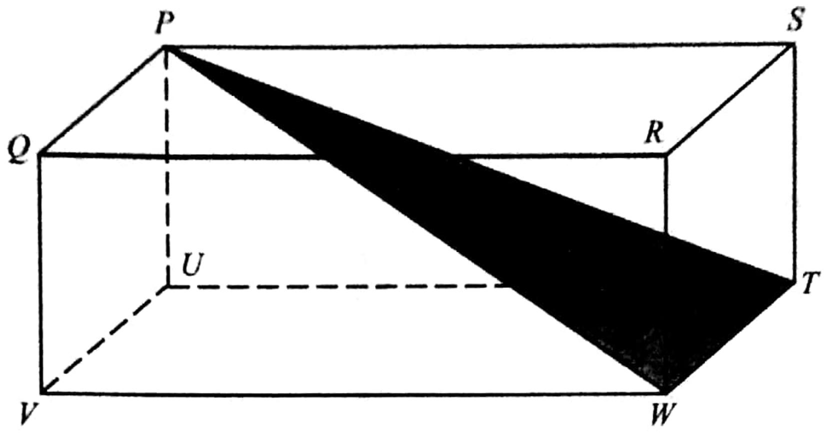

Diagram 8
Rajah 8

Name the angle between the plane *PTW* and the plane *PQVU.*
Namakan sudut di antara satah PTW dengan satah PQVU.

A $\angle TPU$

B $\angle TUP$

C $\angle WPV$

D $\angle WPU$

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15 In Diagram 9, *AB* and *RS* are two vertical poles on a horizontal ground. The angle of depression of peak *R* from peak *A* is 30°.

Dalam Rajah 9, AB dan RS ialah dua batang tiang tegak yang terletak pada satu permukaan mengufuk. Sudut tunduk puncak R dari puncak A ialah 30°.

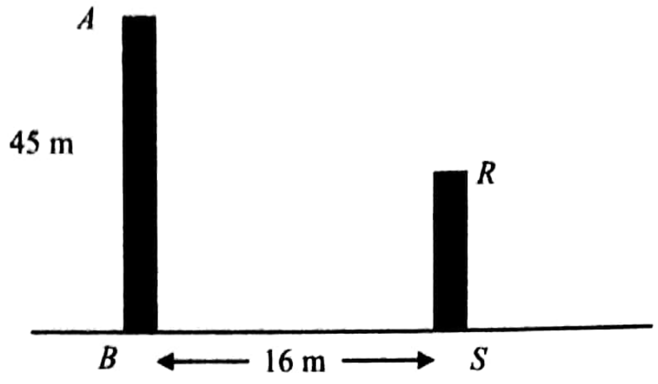

Diagram 9
Rajah 9

Calculate the height, in m, of the pole *RS*.
Hitung tinggi, dalam m, *bagi tiang RS.*

A 13·85

B 31·14

C 35·76

D 37·00

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16 In Diagram 10, J and L are two points on a horizontal plane. LK is a vertical pole.
Dalam Rajah 10, J dan L adalah dua titik di atas satah mengufuk. LK adalah tiang tegak.

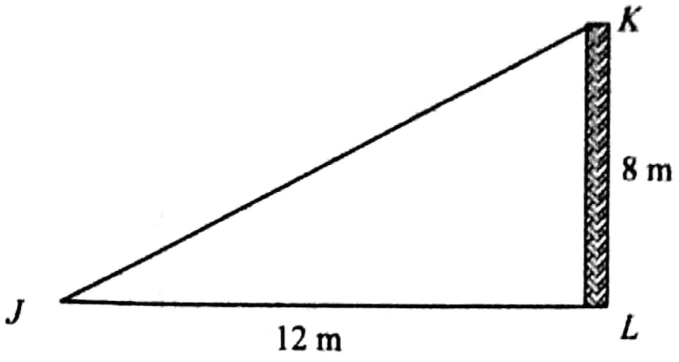

Diagram 10
Rajah 10

The angle of depression of point J from vertex K is
Sudut tunduk titik J dari puncak K ialah

A 26° 24'

B 28° 46'

C 32° 24'

D 33° 41'

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17 Diagram 11 shows the positions of point R and point S.
Rajah 11 menunjukkan kedudukan titik R dan titik S.

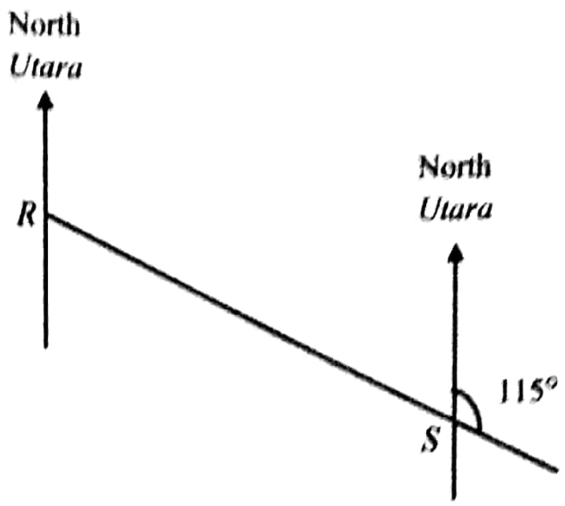

Diagram 11
Rajah 11

Find the bearing of R from S.
Cari bearing R dari S.

A 065°

B 115°

C 295°

D 315°

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18 Diagram 12 shows the position of five towns, **A**, **B**, **C**, **D** and Y, on the surface of the earth.
Rajah 12 *menunjukkan kedudukan lima bandar,* **A**, **B**, **C**, **D** *dan* Y, *di atas permukaan bumi.*

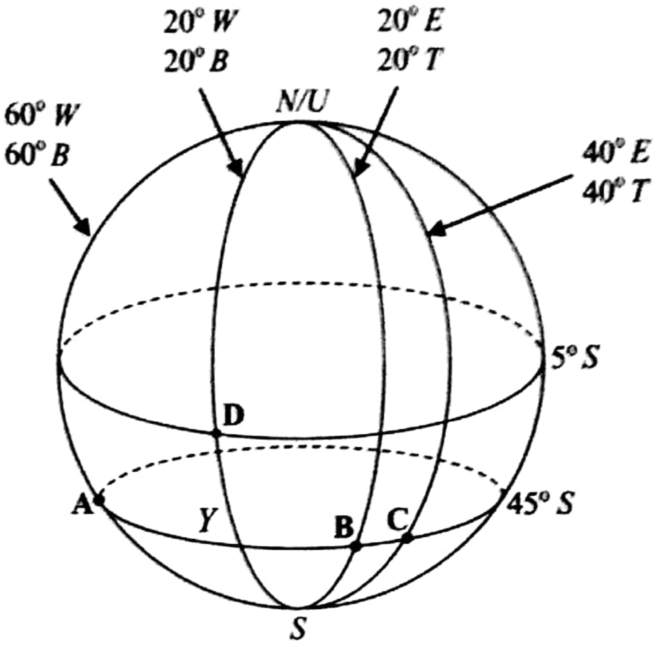

Diagram 12
Rajah 12

Which of the towns, **A**, **B**, **C** or **D**, is located due west of Y with difference longitude of 40°?
Antara bandar, **A**, **B**, **C** *dan* **D**, *yang manakah berada di barat Y dengan beza longitud* 40°?

19 $3(2x-3)-2(x+2)=$

A $4x-13$

B $4x-10$

C $4x-5$

D $4x-2$

20 Express $\frac{p-1}{pq}-\frac{p-2q}{2pq^2}$ as a single fraction in its simplest form.

Ungkapkan $\frac{p-1}{pq}-\frac{p-2q}{2pq^2}$ *sebagai satu pecahan tunggal dalam bentuk termudah.*

A $\frac{q-1}{q^2}$

B $\frac{2q-1}{2q^2}$

C $\frac{q-p}{q^2}$

D $\frac{2q-1}{2q}$

21 Given $\frac{m-6}{3}-\frac{m+4}{2}=-7$, then $m =$

Diberi $\frac{m-6}{3}-\frac{m+4}{2}=-7$, *maka* $m =$

A 18

B 42

C −18

D −42

22 $3f-2(2f-5)+5=$

A $-f-5$

B $f+10$

C $-f+15$

D $f-10$

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23 Simplify:
Permudahkan:

$$\left(3b^{-1}c^{\frac{1}{2}}\right)^2 \times \frac{b^3d^4}{d^8}$$

A $\dfrac{9b^2c}{d^4}$

B $\dfrac{9b}{d^2}$

C $\dfrac{3bc}{d^4}$

D $\dfrac{9bc}{d^4}$

24 $a^{\frac{3}{5}} =$

A $\sqrt[5]{a^3}$

B $\sqrt[3]{a^5}$

C $\dfrac{1}{\sqrt[5]{a^3}}$

D $\dfrac{1}{\sqrt[3]{a^5}}$

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25 List all the integers x which satisfy both the simultaneous linear inequalities
$\frac{1}{3}x - 2 \geq 1$ and $16 - x \geq 2$.

Senaraikan semua integer x yang memuaskan kedua-dua ketaksamaan linear serentak
$\frac{1}{3}x - 2 \geq 1$ *dan* $16 - x \geq 2$.

A 10, 11, 12, 13

B 9, 10, 11, 12, 13

C 10, 11, 12, 13, 14

D 9, 10, 11, 12, 13, 14

26 Find the solution for $2 - \frac{2k}{3} > 3 + k$.

Cari penyelesaian bagi $2 - \frac{2k}{3} > 3 + k$.

A $k < -\frac{3}{5}$

B $k > -\frac{3}{5}$

C $k < \frac{3}{5}$

D $k > \frac{3}{5}$

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27 Diagram 13 is a pie chart showing the amount spent on three types of clothes at a boutique for the particular day.

Rajah 13 ialah carta pai yang menunjukkan jumlah yang dibelanjakan untuk tiga jenis pakaian di sebuah butik pada suatu hari tertentu.

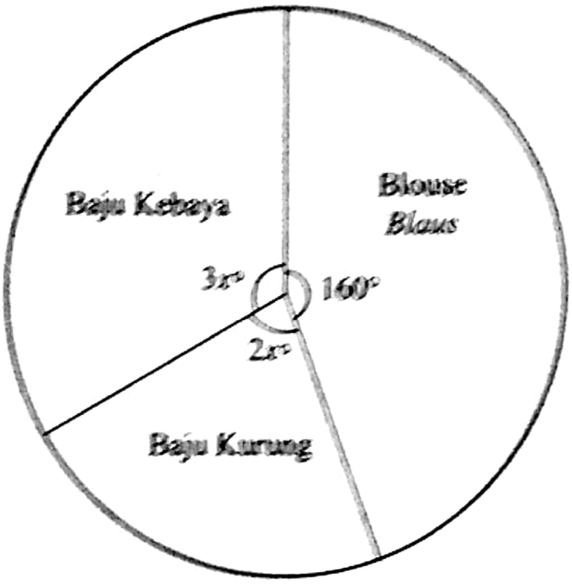

Diagram 13
Rajah 13

The amount spent for blouse on that day is RM180.
Calculate the amount spent for baju kebaya on that day, in RM.

Jumlah perbelanjaan blaus pada hari itu ialah RM180.
Hitung, jumlah perbelanjaan baju kebaya pada hari itu, dalam RM.

A 40

B 120

C 135

D 180

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28 Table 1 shows the number of magazines bought by a group of students in a school.
Jadual 1 menunjukkan bilangan majalah yang dibeli oleh sekumpulan murid dalam satu sekolah.

Number of magazines *Bilangan majalah*	1	2	3	4	5
Frequency *Kekerapan*	4	6	6	9	10

Table 1
Jadual 1

Find the median of the data.
Cari median bagi data itu.

A 1

B 2

C 3

D 4

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20 Diagram 14 is a pictogram showing the number of form four students who pass in a Mathematics test.

Rajah 14 ialah piktogram yang menunjukkan bilangan murid tingkatan empat yang lulus dalam suatu ujian Matematik.

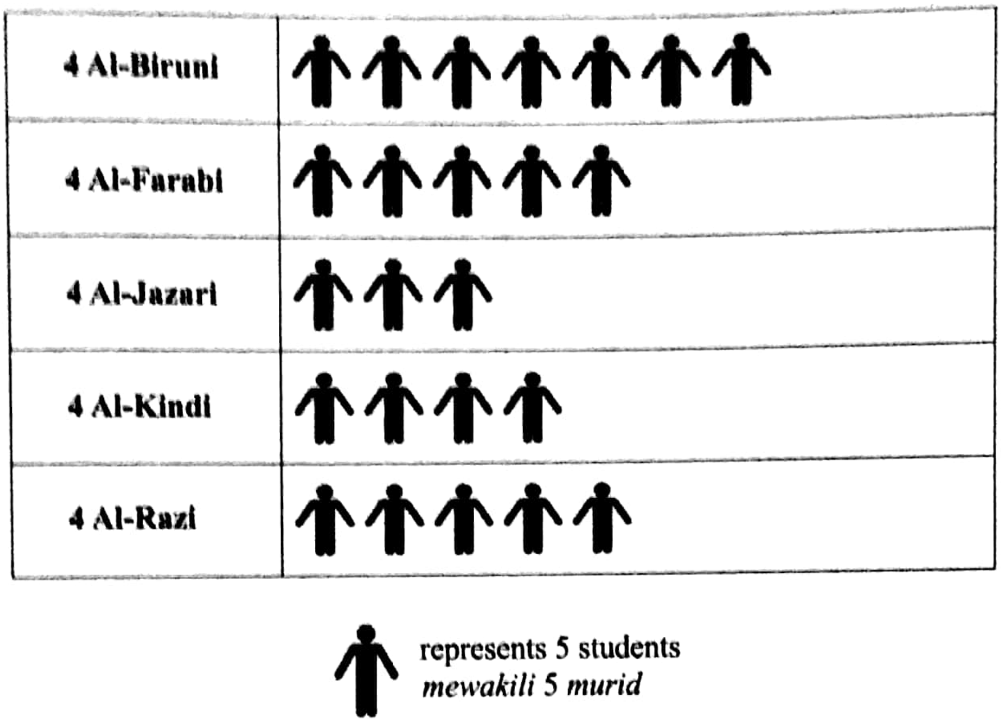

Diagram 14
Rajah 14

It is given that 20% of the total number of form four students failed the Mathematics test.
Calculate the total number of form four students.

Diberi bahawa 20% daripada jumlah bilangan murid tingkatan empat gagal dalam ujian Matematik itu.
Hitung jumlah bilangan murid tingkatan empat.

A 144

B 150

C 216

D 600

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30 Diagram 15 shows a graph of a quadratic function.
Rajah 15 *menunjukkan graf bagi satu fungsi kuadratik.*

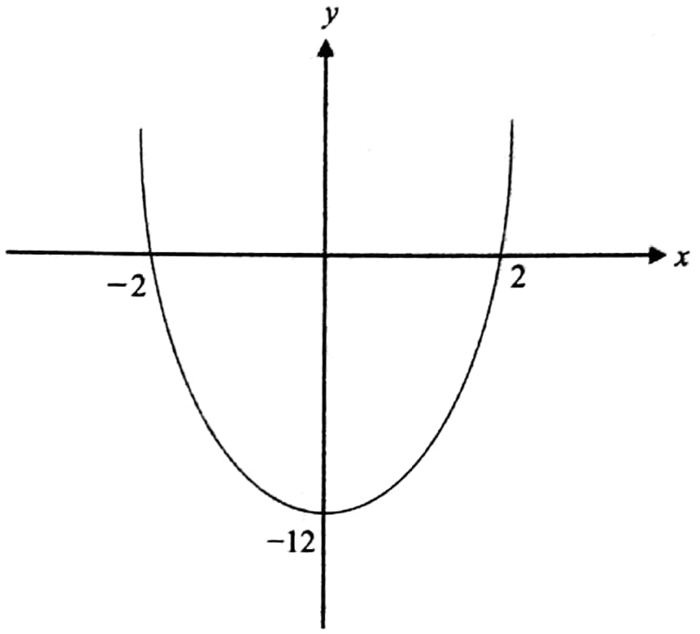

Diagram 15
Rajah 15

Which equation represents the graph?
Persamaan manakah yang mewakili graf tersebut?

A $y = 3x^2 + 2$

B $y = -3x^2 + 2$

C $y = 3x^2 - 12$

D $y = -3x^2 - 12$

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31 Diagram 16 is a Venn diagram showing the universal set ξ, set A and set B.
Rajah 16 ialah gambar rajah Venn yang menunjukkan set semesta ξ, set A dan set B.

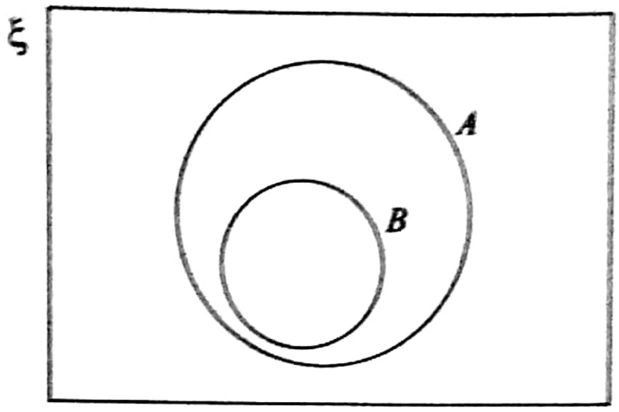

Diagram 16
Rajah 16

Which of the following is true?
Antara berikut, yang manakah benar?

A $A \subset B$

B $A \cup B = B$

C $A \cap B = A$

D $A \cap B = B$

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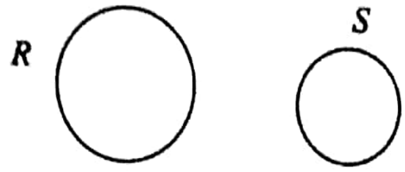
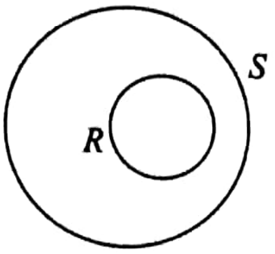
32 Which of the following Venn Diagrams represents set $R \subset S$ such that the universal set $\xi = R \cup S$?

Antara gambar rajah Venn yang berikut, yang manakah mewakili set $R \subset S$ dengan keadaan set semesta $\xi = R \cup S$?

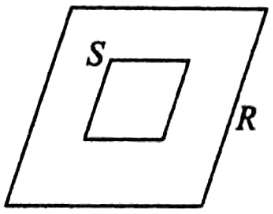
A



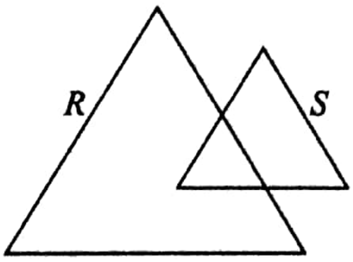
B



C



D



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33 Find the x-intercept of the straight line $4x - 3y = 36$.

Cari pintasan- x bagi garis lurus $4x - 3y = 36$.

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

B $\frac{4}{3}$

C 9

D −12

34 In Diagram 17, *MN* is a straight line.

Dalam Rajah 17, MN ialah garis lurus.

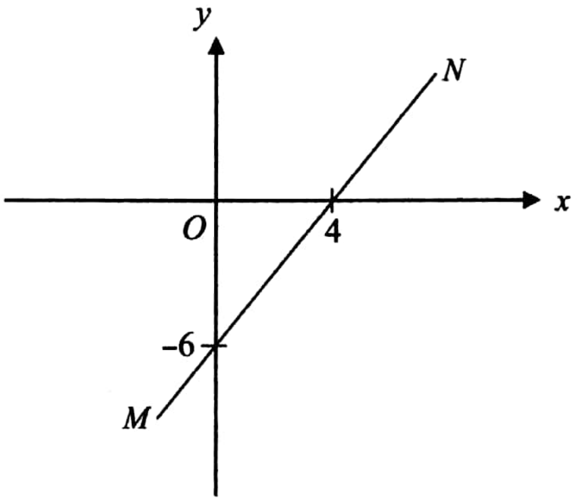

Diagram 17
Rajah 17

What is the gradient of the straight line *MN*?

Apakah kecerunan bagi garis lurus MN?

A $-\frac{3}{2}$

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

C $\frac{2}{3}$

D $\frac{3}{2}$

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35 Table 2 shows the number of coloured cards in a box.
Jadual 2 menunjukkan bilangan kad berwarna yang terdapat di dalam sebuah kotak.

Cards ***Kad***	Ungu *Purple*	Blue *Biru*	Red *Merah*
Number ***Bilangan***	4	x	3

Table 2
Jadual 2

The probability that a purple card is chosen at random from the box is $\frac{1}{3}$.
Find the value of x.

Kebarangkalian bahawa sekeping kad berwarna ungu dipilih secara rawak daripada kotak itu ialah $\frac{1}{3}$.
Cari nilai x.

A 2

B 3

C 4

D 5

36 A box contains 40 small balls. There are 6 small black balls, 10 small green balls and the rest are small yellow balls. A small ball is chosen at random.
Find the probability of getting a small yellow ball.

Sebuah kotak mengandungi 40 *biji bola kecil. Terdapat* 6 *biji bola kecil hitam*, 10 *biji bola kecil hijau dan selebihnya adalah bola kecil kuning. Sebiji bola kecil dipilih secara rawak.*
Cari kebarangkalian sebiji bola kecil kuning dipilih.

A $\frac{1}{2}$

B $\frac{3}{5}$

C $\frac{19}{40}$

D $\frac{13}{26}$

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37 It is given that y varies inversely as the cube root of x and $y = 6$ when $x = 8$.
Calculate the value of x when $y = 4$.

Diberi bahawa y berubah secara songsang dengan punca kuasa tiga x dan y = 6 apabila x = 8.
Hitung nilai x apabila y = 4.

A 3

B 9

C 12

D 27

38 Table 3 shows some values of the variables x and y such that y varies directly as the square root of x.
Find the relationship between y and x.

Jadual 3 menunjukkan sebahagian daripada nilai-nilai bagi pembolehubah x dan y dengan keadaan y berubah secara langsung dengan punca kuasa dua x.
Cari hubungan antara y dan x.

x	y
4	8
25	20

Table 3
Jadual 3

A $y = 4\sqrt{x}$

B $y = \frac{16}{\sqrt{x}}$

C $y = \frac{1}{2}x^2$

D $y = \frac{128}{x^2}$

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39 $2\begin{pmatrix} 1 & 3 \\ 2 & 9 \end{pmatrix} - \begin{pmatrix} -1 & 0 \\ 8 & -3 \end{pmatrix} =$

A $\begin{pmatrix} 3 & 6 \\ -4 & 21 \end{pmatrix}$

B $\begin{pmatrix} 1 & 6 \\ 4 & 15 \end{pmatrix}$

C $\begin{pmatrix} 3 & 3 \\ -5 & 12 \end{pmatrix}$

D $\begin{pmatrix} 1 & 6 \\ -3 & 3 \end{pmatrix}$

40 Given $\begin{pmatrix} -3 & k \end{pmatrix}\begin{pmatrix} k & 8 \\ 6 & 0 \end{pmatrix} = \begin{pmatrix} 21 & -24 \end{pmatrix}$, find the value of k.

Diberi $\begin{pmatrix} -3 & k \end{pmatrix}\begin{pmatrix} k & 8 \\ 6 & 0 \end{pmatrix} = \begin{pmatrix} 21 & -24 \end{pmatrix}$, *cari nilai* k.

A −8

B −3

C 4

D 7

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT

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Section A
Bahagian A

[52 *marks*]
[52 *markah*]

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

1 State the three inequalities that represent the shaded region in Diagram 1.
Nyatakan tiga ketaksamaan yang mewakili kawasan berlorek dalam Rajah 1.

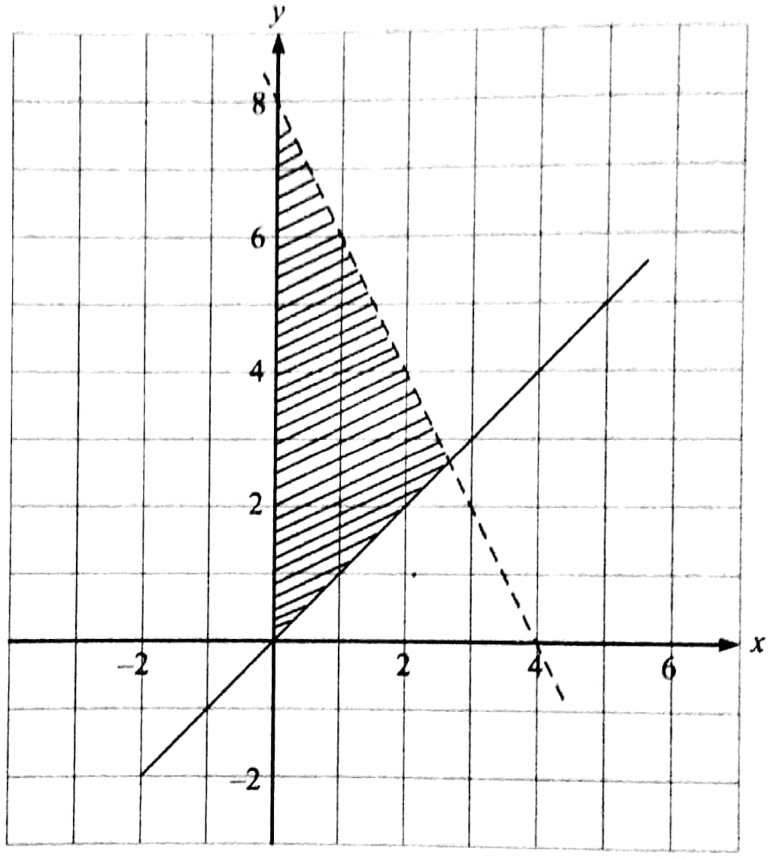

Diagram 1
Rajah 1

[3 *marks*]
[3 *markah*]

Answer / *Jawapan* :

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2 Diagram 2 shows a right prism with rectangular base *PQRS* on a horizontal plane. Trapezium *PQGF* is the uniform cross section of the prism. *QG* and *RH* are vertical edges. Point *E* is vertically above point *M*.

Rajah 2 menunjukkan sebuah prisma tegak dengan tapak segi empat tepat PQRS di atas satah mengufuk. Trapezium PQGF ialah keratan rentas seragam prisma itu. Tepi QG dan RH adalah tegak. Titik E berada tegak di atas titik M.

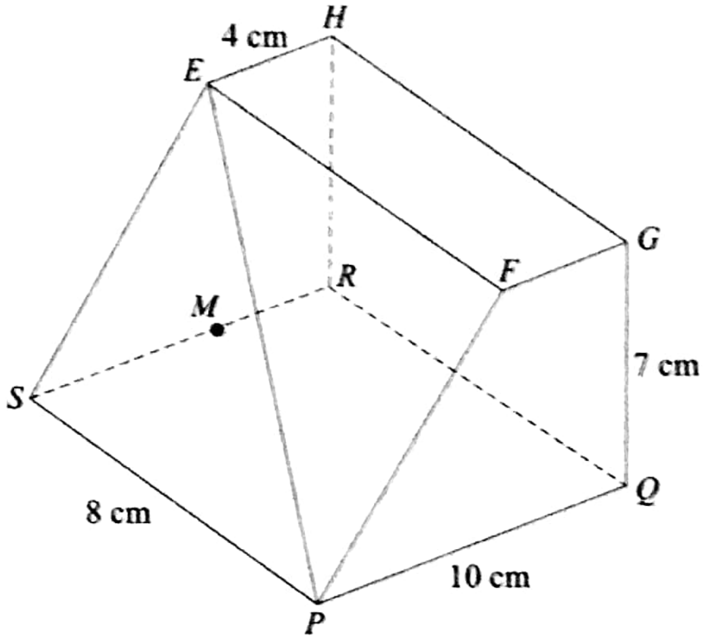

Diagram 2
Rajah 2

(*a*) On Diagram 2, mark the angle between the line *PE* and the plane *PQRS*.
Pada Rajah 2, tandakan sudut di antara garis PE dan satah PQRS.

(*b*) Hence, calculate the angle between the line *PE* and the plane *PQRS*.
Seterusnya, hitung sudut di antara garis PE dan satah PQRS.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan* :

(*b*)

3 Diagram 3 shows a rectangle $ABCD$. E is the midpoint of AB.

Rajah 3 menunjukkan sebuah segi empat tepat ABCD. E ialah titik tengah AB.

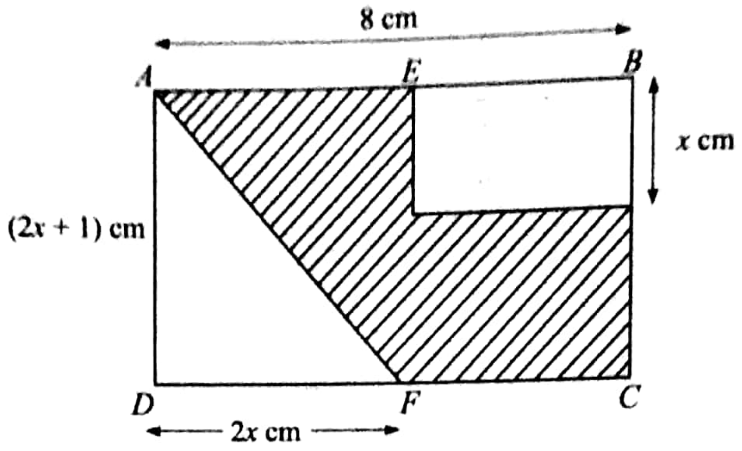

Diagram 3
Rajah 3

Given the area of the shaded region is 22 cm^2.
Find the values of x. [4 *marks*]

Diberi luas kawasan berlorek ialah 22 cm^2.
Cari nilai-nilai x. [4 *markah*]

Answer / *Jawapan* :

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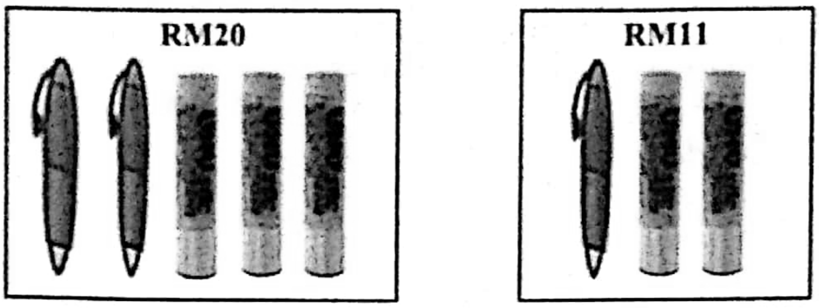
4 Diagram 4 shows two packages of stationeries sold in a bookstore.
Rajah 4 menunjukkan dua pakej alat tulis yang dijual di sebuah kedai buku.



Package A
Pakej A

Package B
Pakej B

Diagram 4
Rajah 4

For the two packages of the stationeries, the price of each bottle of glue is the same, so as the price of each pen.

Calculate the price, in RM, of a pen and a bottle of glue.

Bagi dua pakej alat tulis itu, harga setiap botol gam adalah sama, begitu juga dengan harga setiap pen.

Hitung harga, dalam RM, *bagi sebatang pen dan sebotol gam.*

[4 *marks*]
[4 *markah*]

Answer / *Jawapan* :

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5 Diagram 5 shows a combined solid consisting of a right prism and a right pyramid which are joined at the plane $TUVW$. X is vertically above the base $TUVW$. Trapezium $QRVU$ is the uniform cross section of the prism. $PQ = TU = UV = 8$ cm.

Rajah 5 menunjukkan sebuah gabungan pepejal yang terdiri daripada sebuah prisma tegak dan sebuah piramid tegak yang tercantum pada satah $TUVW$. X terletak tegak di atas tapak $TUVW$. Trapezium $QRVU$ ialah keratan rentas seragam prisma itu. $PQ = TU = UV = 8$ cm.

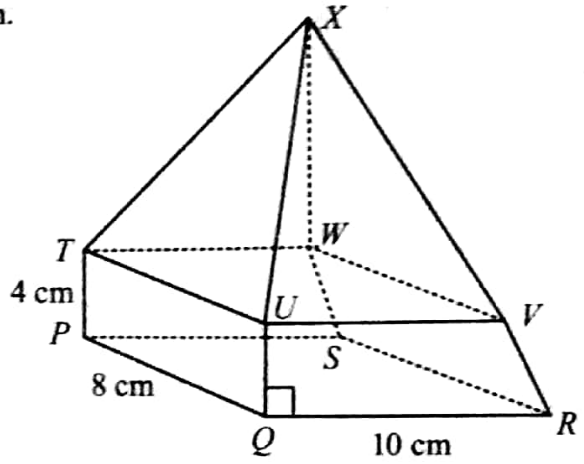

Diagram 5
Rajah 5

(*a*) Calculate the volume, in cm³, of the prism.
Hitung isi padu, dalam cm³, *prisma itu.*

(*b*) It is given that the volume of the combined solid is 420 cm³.
Calculate the height, in cm, of the pyramid.

Diberi bahawa isi padu gabungan pepejal itu ialah 420 cm³.
Hitung tinggi, dalam cm, *piramid itu.*

[4 *marks*]
[4 *markah*]

Answer / *Jawapan* :

(*a*)

(*b*)

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6 Diagram 6 shows a circular *CD* is cut from a square aluminium foil with sides of 10 cm. A hole of diameter 2 cm is then cut from the centre.

Rajah 6 *menunjukkan sebuah CD berbentuk bulatan dipotong daripada sebuah kerajang aluminium berbentuk segi empat sama dengan sisi* 10 cm. *Sebuah lubang berdiameter* 2 cm *kemudian dipotong daripada bahagian tengah.*

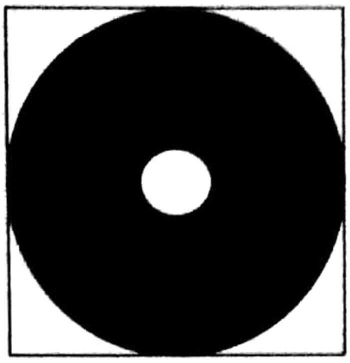

Diagram 6
Rajah 6

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

Menggunakan $\pi = \frac{22}{7}$, *hitung*

(*a*) the perimeter, in cm, of the shaded *CD*,
perimeter, dalam cm, *CD berlorek itu,*

(*b*) the area, in cm^2, of the shaded *CD*.
luas, dalam cm^2, *CD berlorek itu.*

[6 *marks*]
[6 *markah*]

Answer / *Jawapan* :

(*a*)

(*b*)

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7 (*a*) State whether the sentence below is a statement or not a statement.
Nyatakan sama ada ayat di bawah ialah pernyataan atau bukan pernyataan.

"21 is a prime number" "21 *ialah nombor perdana*"

(*b*) Complete the following statement with the quantifier 'all' or 'some' to make it a true statement.
Lengkapkan pernyataan berikut dengan menggunakan pengkuantiti 'semua' atau 'sebilangan' untuk membentuk satu pernyataan benar.

.... kites are rhombuses. .... *lelayang ialah rombus.*

(*c*) Write down Premise 1 to complete the following argument:
Tulis Premis 1 untuk melengkapkan hujah berikut:

Premise 1/ *Premis* 1: ....

Premise 2: $m° \neq 45°$.
Premis 2: $m° \neq 45°$.

Conclusion: $\sin m° \neq \cos m°$.
Kesimpulan: $\sin m° \neq \text{kos } m°$.

(*d*) Make a general conclusion by induction for the sequence of numbers 0, 2, 4, 6, ... which follows the following pattern.
Buat satu kesimpulan umum secara aruhan bagi urutan nombor 0, 2, 4, 6, ... *yang mengikut pola nombor yang berikut.*

$$0 = (2) - 2$$
$$2 = (4) - 2$$
$$4 = (6) - 2$$
$$6 = (8) - 2$$
$$\ldots = \ldots\ldots$$

[5 *marks*]
[5 *markah*]

Answer / *Jawapan* :

(*a*) ....

(*b*) ....

(*c*) ....

....

(*d*) ....

8 (*a*) It is given that matrix $P = \begin{pmatrix} 1 & -3 \\ 8 & 12 \end{pmatrix}$ and matrix $Q = \frac{1}{n}\begin{pmatrix} 12 & m \\ -8 & 1 \end{pmatrix}$ such that $PQ = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$. Find the values of m and of n.

Diberi bahawa matriks $P = \begin{pmatrix} 1 & -3 \\ 8 & 12 \end{pmatrix}$ *dan matriks* $Q = \frac{1}{n}\begin{pmatrix} 12 & m \\ -8 & 1 \end{pmatrix}$ *dengan keadaan* $PQ = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$. *Cari nilai m dan nilai n.*

(*b*) Table 8 shows the prices of T-shirts of two brands sold in a shop.

Jadual 8 *menunjukkan harga kemeja-T bagi dua jenama yang dijual di sebuah kedai.*

Brand of T-shirt ***Jenama kemeja-T***	**Price of T-shirt (RM / unit)** ***Harga kemeja-T*** **(RM / *unit*)**
R	8
S	12

Table 8
Jadual 8

On a certain day, the number of T-shirts of brand *R* sold by a shopkeeper was three times the number of T-shirts of brand *S* sold. The total sales of T-shirts received by the shopkeeper on that day was RM432.

By using the matrix method, find the number of T-shirts of each brand sold by the shopkeeper.

Pada suatu hari tertentu, bilangan kemeja-T berjenama R yang dijual oleh seorang pekedai adalah tiga kali bilangan kemeja-T berjenama S yang dijual. Jumlah jualan kemeja-T yang diperoleh pekedai itu pada hari itu ialah RM432.

Dengan menggunakan kaedah matriks, cari bilangan kemeja-T bagi setiap jenama yang dijual oleh pekedai itu.

[6 *marks*]
[6 *markah*]

Answer / *Jawapan* :

(*a*)

(*b*)

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9 Diagram 9 shows the speed-time graph of the movement of two particles, A and B, for a period of 24 s and 22 s respectively. The graph $RSTU$ represents the movement of particle A. The graph MN represents the movement of particle B.

Rajah 9 menunjukkan graf laju-masa bagi pergerakan dua zarah, A dan B, dalam tempoh 24 s *dan* 22 s *masing-masing. Graf RSTU mewakili pergerakan zarah A dan graf MN mewakili pergerakan zarah B.*

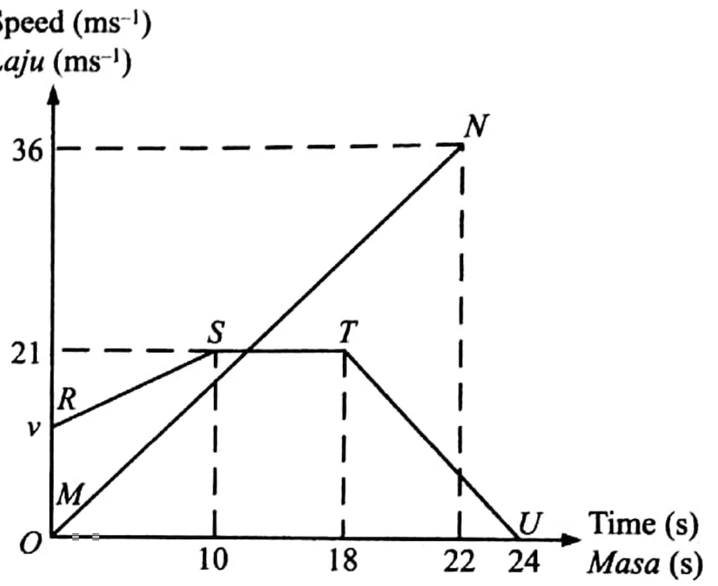

Diagram 9
Rajah 9

(*a*) State the uniform speed, in ms^{-1}, zarah A.

Nyatakan laju seragam, dalam ms^{-1}, *zarah A.*

(*b*) Calculate the rate of change of speed, in ms^{-2}, of particle A in the last 6 seconds.

Hitung kadar perubahan laju, dalam ms^{-2}, *zarah A dalam* 6 *saat yang terakhir.*

(*c*) Given the distance travelled by particle B is equal to the distance travelled by particle A.

Calculate the value of v.

Diberi jarak yang dilalui oleh zarah B adalah sama dengan jarak yang dilalui oleh zarah A.

Hitung nilai v.

[5 *marks*]
[5 *markah*]

Answer / *Jawapan* :

(*a*)

(*b*)

(*c*)

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10 Diagram 10 shows two cards in box *K*, three cards in bag *M* and five cards in bag *N*.
Rajah 10 *menunjukkan dua kad di dalam kotak K, tiga kad di dalam beg M dan lima kad di dalam beg N.*

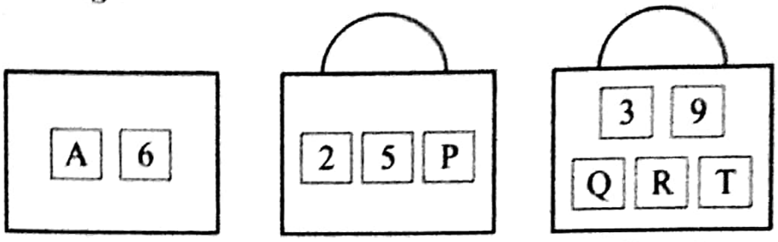

Diagram 10
Rajah 10

A card is picked at random from box *K*. If the card labelled with letter A is chosen, then another card is picked from bag *M*. If the card labelled with number 6 is chosen, then another card is picked from bag *N*.

Satu kad dipilih secara rawak daripada kotak K. Jika kad berlabel dengan huruf A *dipilih, maka satu kad lain dipilih daripada beg M. Jika kad dengan nombor* 6 *dipilih, maka satu kad lain dipilih daripada beg N.*

(*a*) List the sample space.
Senaraikan ruang sampel.

(*b*) List all the possible outcomes of the events and find the probability that
Senaraikan semua kesudahan yang mungkin bagi peristiwa itu dan cari kebarangkalian bahawa

(i) both cards are labelled with numbers,
kedua-dua kad itu berlabel dengan nombor,

(ii) one card is labelled with a number and the other card is labelled with a letter.
satu kad berlabel dengan nombor dan kad yang lain berlabel dengan huruf.

[6 *marks*]
[6 *markah*]

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Answer / *Jawapan* :

(*a*)

(*b*)(i)

(ii)

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11 In Diagram 11, O is the origin. Straight line JK is parallel to straight line RS.
Dalam Rajah 11, O ialah asalan. Garis lurus JK adalah selari dengan garis lurus RS.

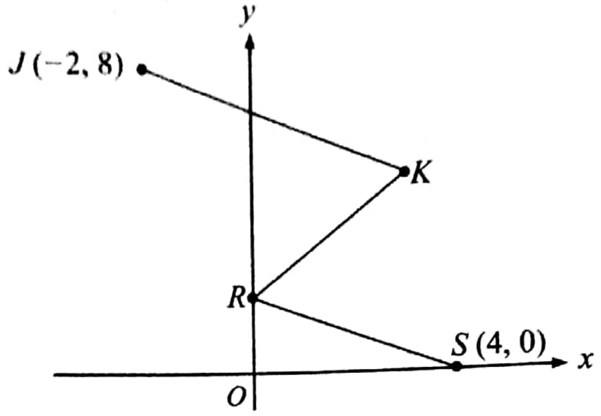

Diagram 11
Rajah 11

Given the equation of the straight line KR is $y = 2x + 2$ and point R is on the y-axis.
Diberi persamaan garis lurus KR ialah $y = 2x + 2$ *dan titik R terletak pada paksi-y.*

Find
Cari

(*a*) the y-intercept of the straight line KR,
pintasan-y bagi garis lurus KR,

(*b*) the equation of the straight line JK,
persamaan bagi garis lurus JK,

(*c*) the x-intercept of the straight line JK.
pintasan-x bagi garis lurus JK.

[6 *marks*]
[6 *markah*]

Answer / *Jawapan* :

(*a*)

(*b*)

(*c*)

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Section B
Bahagian B

[48 *marks*]
[48 *markah*]

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

12 (*a*) Complete Table 12 in the answer space on page **18**, for the equation $y = x^3 + 2x^2 - 5x - 6$ by writing down the values of y when $x = -3$ and $x = 1$.
[2 *marks*]

Lengkapkan Jadual 12 *di ruang jawapan pada halaman* **18**, *bagi persamaan* $y = x^3 + 2x^2 - 5x - 6$ *dengan menulis nilai-nilai y apabila* $x = -3$ *dan* $x = 1$.
[2 *markah*]

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

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

Using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 10 units on the y-axis, draw the graph of $y = x^3 + 2x^2 - 5x - 6$ for $-4 \leq x \leq 4$. [4 *marks*]

Menggunakan skala 2 cm *kepada* 1 *unit pada paksi-x dan* 2 cm *kepada* 10 *unit pada paksi-y, lukis graf* $y = x^3 + 2x^2 - 5x - 6$ untuk $-4 \leq x \leq 4$. [4 *markah*]

(*c*) From the graph in **12**(*b*), find

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

(i) the value of y when $x = -1{\cdot}5$,

nilai y apabila $x = -1{\cdot}5$,

(ii) the value of x when $y = 55$.

nilai x apabila $y = 55$.

[2 *marks*]
[2 *markah*]

(*d*) Draw a suitable straight line on the graph in **12**(*b*) to find the values of x which satisfy the equation $x^3 + 2x^2 - 8x - 3 = 0$ for $-4 \leq x \leq 4$.

State these values of x. [4 *marks*]

Lukis satu garis lurus yang sesuai pada graf di **12**(*b*) *untuk mencari nilai-nilai x yang memuaskan persamaan* $x^3 + 2x^2 - 8x - 3 = 0$ *untuk* $-4 \leq x \leq 4$.

Nyatakan nilai-nilai x ini. [4 *markah*]

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Answer / *Jawapan*:

(*a*) $y = x^3 + 2x^2 - 5x - 6$

x	−4	−3	−2	−1	0	1	2	3	4
y	−18		4	0	−6		0	24	70

Table 12
Jadual 12

(*b*) Refer to the graph on page **19**.

Rujuk graf di halaman **19**.

(*c*)(i) y = ………………………………

(ii) x = ………………………………

(*d*)

x = ……………., ………………….., …………………..

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13 (*a*) Diagram 13.1 shows the point P and the point Q drawn on a Cartesian plane.
Rajah 13.1 *menunjukkan titik P dan titik Q dilukis pada suatu satah Cartes.*

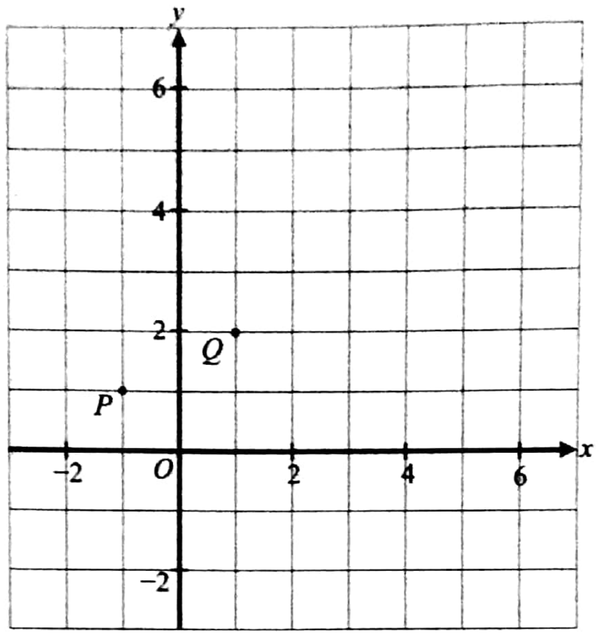

Diagram 13.1
Rajah 13.1

Transformation **T** is a translation $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$.

Transformation **R** is a clockwise rotation of 90° about the centre Q.
State the coordinates of the image of point P under each of the following transformations:

Penjelmaan **T** *ialah satu translasi* $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$.

Penjelmaan **R** *ialah satu putaran* 90° *ikut arah jam pada pusat Q.*
Nyatakan koordinat imej bagi titik P di bawah setiap penjelmaan berikut:

(i) **RT**,

(ii) $\mathbf{R}^2$.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan* :

(*a*)(i)

(ii)

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(*b*) Diagram 13.2 shows two pentagons, *ABCDE* and *PQRST* drawn on a Cartesian plane.

Rajah 13.2 *menunjukkan dua pentagon, ABCDE dan PQRST dilukis pada suatu satah Cartes.*

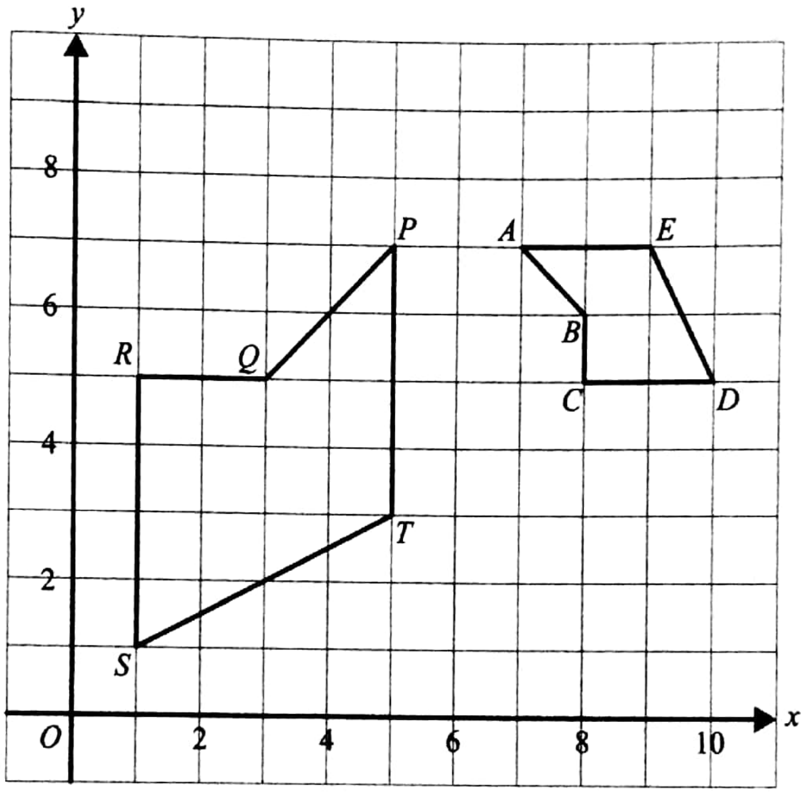

Diagram 13.2
Rajah 13.2

Pentagon *PQRST* is the image of pentagon *ABCDE* under the combined transformation **UV**.
Describe in full, the transformation:

Pentagon PQRST ialah imej bagi pentagon ABCDE di bawah gabungan penjelmaan **UV**.
Huraikan selengkapnya, penjelmaan:

(i) (*a*) **V**,

(*b*) **U**.

(ii) It is given that the pentagon *PQRST* represents a region of area 160 m².
Calculate the area, in m², of pentagon *ABCDE*.

Diberi bahawa pentagon PQRST mewakili suatu kawasan yang mempunyai luas 160 m².
Hitung luas, dalam m², *pentagon ABCDE.*

[8 *marks*]
[8 *markah*]

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Answer / ***Jawapan*** :

(*b*) (i) (*a*)

(*b*)

(ii)

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

(*a*) Diagram 14.1 shows a solid right prism with rectangle base *ABCD* on a horizontal plane. Pentagon *ABHGF* is a uniform cross section of the prism. *FA* and *HB* are vertical edges.

Rajah 14.1 menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segi empat tepat ABCD di atas sebuah satah mengufuk. Pentagon ABHGF ialah keratan rentas seragam prisma itu. Tepi FA dan HB adalah tegak.

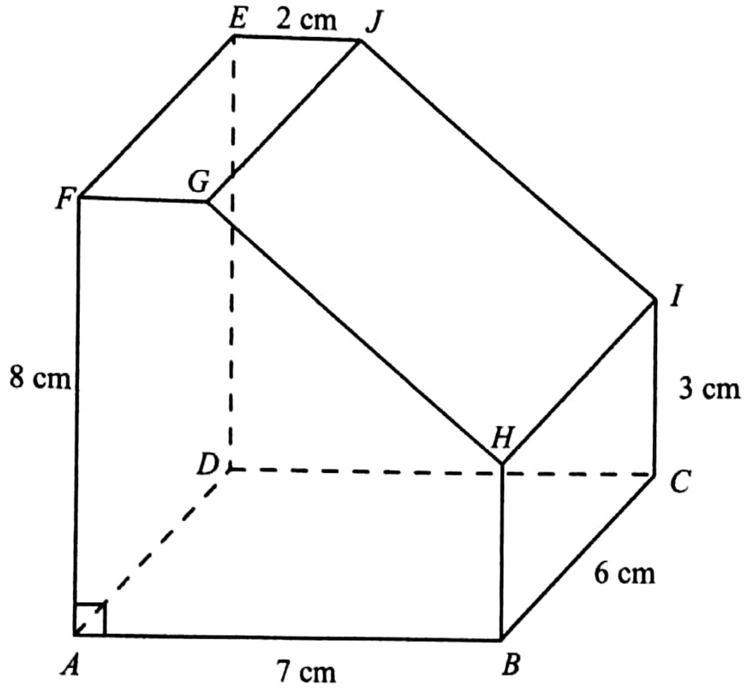

Diagram 14.1
Rajah 14.1

Draw to full scale, the plan of the solid. [3 *marks*]
Lukis dengan skala penuh, pelan pepejal itu. [3 *markah*]

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Answer / *Jawapan* :

(*a*)

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(*b*) Another solid half cylinder with a diameter of 5 cm is cut and removed from the prism in Diagram 14.1. The remaining solid is shown in Diagram 14.2.

Sebuah lagi pepejal berbentuk separuh silinder berdiameter 5 cm *dipotong dan dikeluarkan daripada prisma dalam Rajah* 14.1. *Pepejal yang tinggal adalah seperti yang ditunjukkan dalam Rajah* 14.2.

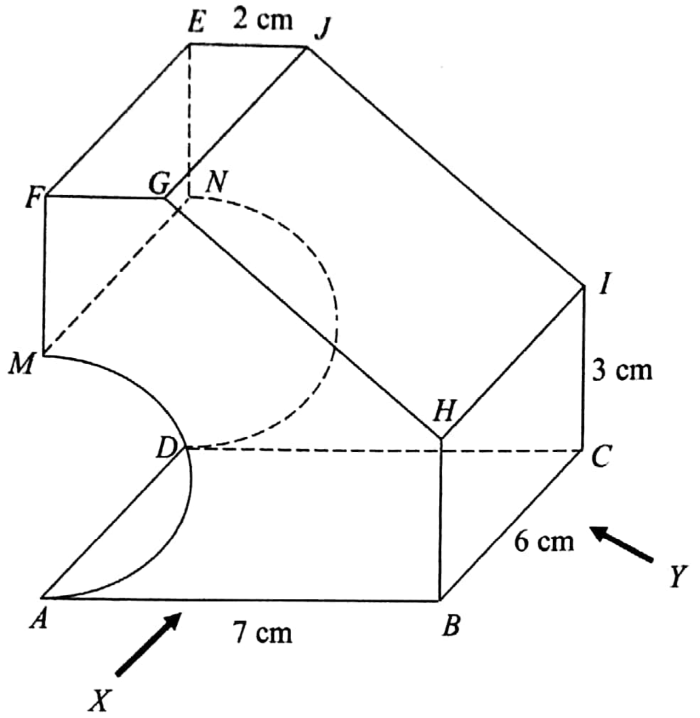

Diagram 14.2
Rajah 14.2

Draw to full scale,
Lukis dengan skala penuh,

(i) the elevation of the remaining solid on a vertical plane parallel to *AB* as viewed from *X*, [4 *marks*]

dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan AB sebagaimana dilihat dari X, [4 *markah*]

(ii) the elevation of the remaining solid on a vertical plane parallel to *BC* as viewed from *Y*. [5 *marks*]

dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan BC sebagaimana dilihat dari Y. [5 *markah*]

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Answer / *Jawapan* :

(*b*) (i), (ii)

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15 Table 15.1 shows the cumulative frequency of the ages of 40 tourists in Singgahsana Hotel.

Jadual 15.1 *menunjukkan taburan kekerapan longgokan umur bagi* 40 *orang pelancong di sebuah Hotel Singgahsana.*

Upper boundary ***Sempadan atas***	**Cumulative frequency** ***Kekerapan Longgokan***
21·5	0
26·5	2
31·5	6
36·5	13
41·5	23
46·5	31
51·5	37
56·5	40

Table 15.1
Jadual 15.1

(*a*) Based on the data in Table 15.1, complete Table 15.2 in the answer space on page **28**. [4 *marks*]

Berdasarkan data dalam Jadual 15.1, *lengkapkan Jadual* 15.2 *di ruang jawapan pada halaman* **28**. [4 *markah*]

(*b*) Based on Table 15.2 on page **28**, calculate the estimated mean ages of the tourists. [3 *marks*]

Berdasarkan Jadual 15.2 *pada halaman* **28**, *hitung min anggaran umur bagi pelancong-pelancong itu.* [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 5 years on the horizontal axis and 2 cm to 1 tourist on the vertical axis, draw a frequency polygon for the data.
[4 *marks*]

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan di halaman **29**.
Dengan menggunakan skala 2 cm *kepada* 5 *tahun pada paksi mengufuk dan* 2 cm *kepada* 1 *pelancong pada paksi mencancang, lukis satu poligon kekerapan bagi data tersebut.* [4 *markah*]

(*d*) State one information based on the frequency polygon in **15**(*c*). [1 *mark*]
Nyatakan satu maklumat berdasarkan poligon kekerapan di **15**(*c*).
[1 *markah*]

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Answer / *Jawapan*:

(*a*)

Ages (years) *Umur (tahun)*	Frequency *Kekerapan*	Midpoint *Titik Tengah*
17 – 21	0	19
22 – 26		

Table 15.2
Jadual 15.2

(*b*)

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

(*d*)

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16 $J(35° S, 80° W)$, $K(0° N, 80° W)$, $L(35° S, 20° E)$ and M are four points on the surface of the earth. JM is a diameter of the earth.

$J(35° S, 80° B)$, $K(0° U, 80° B)$, $L(35° S, 20° T)$ dan M ialah empat titik pada permukaan bumi. JM ialah diameter bumi.

(*a*) State the location of point M. [3 *marks*]

Nyatakan kedudukan titik M. [3 *markah*]

(*b*) K is 2 700 nautical miles from J, measured along the same meridian.
Calculate the value of θ. [3 *marks*]

K adalah 2 700 *batu nautika dari J, diukur sepanjang meridian yang sama.*
Hitung nilai θ. [3 *markah*]

(*c*) Calculate the distance, in nautical miles, from J due east to L, measured along the common parallel of latitude. [3 *marks*]

Hitung jarak, dalam batu nautika, dari J arah timur ke L, diukur sepanjang selarian latitud sepunya. [3 *markah*]

(*d*) An aeroplane took off from K and flew due south to J. Then, it flew due east to L. The average speed of the aeroplane was 520 knots.
Calculate the total time, in hours, taken for the whole flight. [3 *marks*]

Sebuah kapal terbang berlepas dari K dan terbang arah selatan ke J. Kemudian, kapal terbang itu terbang arah timur ke L. Purata laju kapal terbang itu ialah 520 *knot.*
Hitung jumlah masa, dalam jam, yang diambil bagi keseluruhan penerbangan itu. [3 *markah*]

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