

1449/1
Mathematics
Kertas 1
2013
 $1\frac{1}{4}$ jam



SEKOLAH MENENGAH KEBANGSAAN KAMPUNG GELAM, MELAKA

PEPERIKSAAN PERCUBAAN SPM
TAHUN 2013

MATHEMATICS

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
3. Kertas soalan ini mengandungi **40 soalan**.
4. Jawab **semua** soalan.
5. Jawab **semua** soalan dengan **menghitamkan** ruangan yang betul pada kertas jawapan objektif.
6. **Hitamkan satu** ruangan sahaja bagi setiap soalan.
7. Rajah yang mengiringi soalan **tidak dilukis** mengikut skala kecuali dinyatakan.
8. Satu senarai rumus disediakan di halaman 2 dan 3.
9. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

Kertas soalan ini mengandungi 19 halaman bercetak.

MATHEMATICAL FORMULAE

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

RELATIONS

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

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

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

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

$$5 \quad P(A) = \frac{n(A)}{n(S)}$$

$$6 \quad P(A') = 1 - P(A)$$

$$7 \quad \text{Distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$8 \quad \text{Midpoint, } (x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$9 \quad \text{Average speed} = \frac{\text{distance travelled}}{\text{time taken}}$$

$$10 \quad \text{Mean} = \frac{\text{sum of data}}{\text{number of data}}$$

$$11 \quad \text{Mean} = \frac{\text{sum of (class mark} \times \text{frequency)}}{\text{sum of frequencies}}$$

$$12 \quad \text{Pythagoras Theorem} \\ c^2 = a^2 + b^2$$

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

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

SHAPES AND SPACE

- 1 Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
- 2 Circumference of circle = $\pi d = 2\pi r$
- 3 Area of circle = πr^2
- 4 Curved area of cylinder = $2\pi r h$
- 5 Surface area of sphere = $4\pi r^2$
- 6 Volume of right prism = cross sectional area \times length
- 7 Volume of cylinder = $\pi r^2 h$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
- 11 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
- 12
$$\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 13
$$\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 14 Scale factor, $k = \frac{PA'}{PA}$
- 15 Area of image = $k^2 \times \text{area of object}$

- 1 Which number is rounded off correctly to three significant figures.
Nombor yang manakah dibundarkan betul kepada tiga angka bererti .

	Number <i>Nombor</i>	Rounded off correct to three significant figures <i>Dibundarkan betul kepada tiga angka bererti</i>
A	0.08567	0.0857
B	0.08575	0.0857
C	94120	94200
D	94250	94200

- 2 Given that $12\,630\,000 = m \times 10^n$, where $m \times 10^n$ is a number in standard form. State the value of m and of n .
Diberi bahawa $12\,630\,000 = m \times 10^n$, di mana $m \times 10^n$ ialah satu nombor dalam bentuk piawai. Nyatakan nilai m dan nilai n .

- A $m = 1.263$, $n = -7$
 B $m = 1.263$, $n = 7$
 C $m = 12.63$, $n = -7$
 D $m = 12.63$, $n = 7$

- 3 $4.3 \times 10^4 - 2.5 \times 10^3 =$

- A 4.05×10^4
 B 4.05×10^3
 C 1.80×10^4
 D 1.80×10^3

- 4 $\frac{0.00056}{40000} =$

- A 1.4×10^{-9}
 B 1.4×10^9
 C 1.4×10^{-8}
 D 1.4×10^8

- 5 What is the value of the digit 4 , in base ten ,of the number 1430_5
Apakah nilai digit 4 ,dalam asas sepuluh , bagi nombor 1430_5 .

- A 25
 B 100
 C 125
 D 500

6 $100110_2 + 110101_2 =$

- A 1111011₂
 B 1101101₂
 C 1101110₂
 D 1011011₂

- 7 In Diagram 1, $PQRST$ is a irregular pentagon and USV is an equilateral triangle.
 Dalam Rajah 1, $PQRST$ ialah sebuah pentagon tak sekata dan USV adalah segitiga sama sisi .

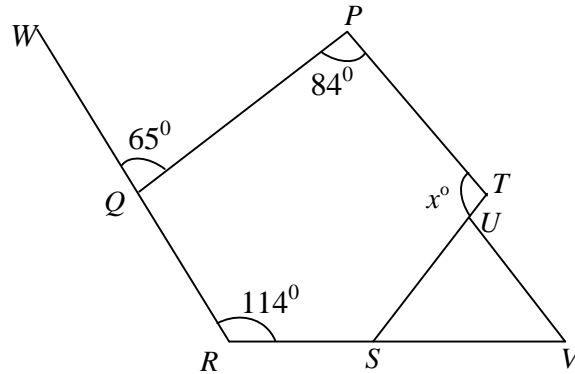


Diagram 1
Rajah 1

Find the value of x° .

Cari nilai x° .

- A 107
 B 115
 C 120
 D 162
- 8 In Diagram 2, PQR is a tangent to the circle TQS with centre O at Q .
 Dalam Rajah 2, PQR ialah tangen kepada bulatan TQS , berpusat O di Q .

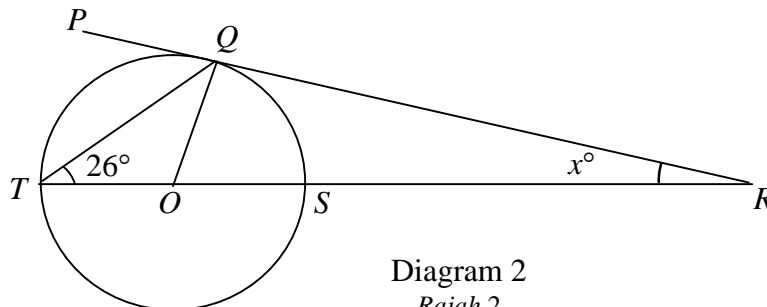


Diagram 2
Rajah 2

Find the value of x° .

Cari nilai x° .

- A 13
 B 38
 C 52
 D 64

- 9 In Diagram 3, point Q undergoes a rotation of 180° about centre $(0, 1)$.
 Dalam Rajah 3, titik Q melalui putaran 180° pada pusat $(0, 1)$.

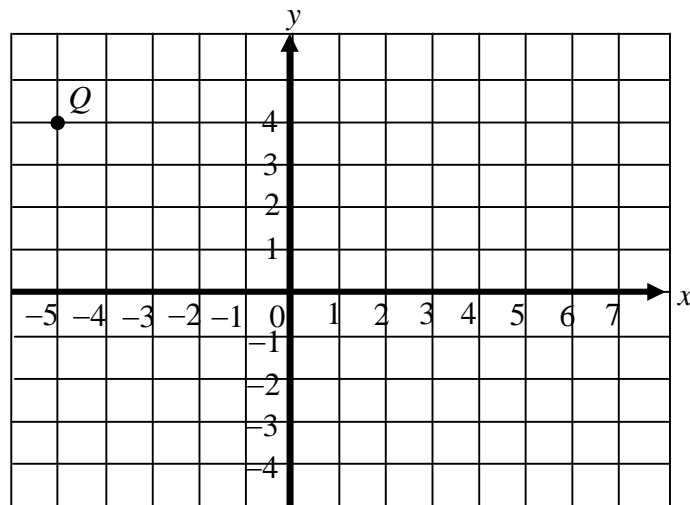


Diagram 3
Rajah 3

The coordinates of the image of point Q under that rotation is
 Koordinat bagi imej Q di bawah putaran tersebut ialah

- A $(-2, -5)$
 B $(-5, -2)$
 C $(5, -2)$
 D $(-2, 5)$
- 10 Under an enlargement, the area of an object is 63 cm^2 and the area of its image is 7 cm^2 .
 Find the scale factor of the enlargement.
 Di bawah suatu pembesaran, luas suatu objek ialah 63 cm^2 dan luas imejnya ialah 7 cm^2 . Cari faktor skala pembesaran itu.
- A 3
 B 9
 C $\frac{1}{9}$
 D $\frac{1}{3}$

- 11 Diagram 4 shows a right angled triangle PQR and PQS . $PR = RS$.
Rajah 4 menunjukkan dua buah segi tiga bersudut tegak PQR dan PQS . $PR = RS$.

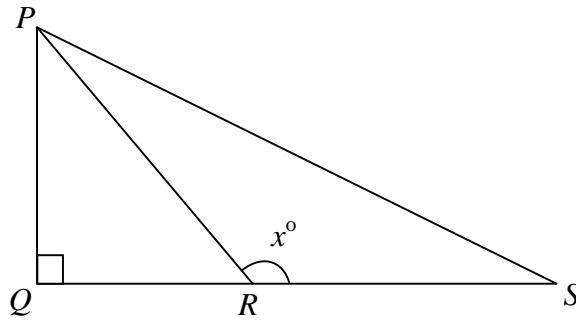


Diagram 4
Rajah 4

Given $\sin x = \frac{3}{5}$ and $RS = 25$ cm, calculate the length, in cm, of QS .

Diberi $\sin x = \frac{3}{5}$ dan $RS = 25$ cm, hitung panjang, dalam cm, bagi QS .

- A 12
 B 15
 C 25
 D 45
- 12 Diagram 5 shows a sailing boat. The sail SPN has a shape of right angled triangle, $MNPQ$ and RSP are a straight lines.
Rajah 5 menunjukkan sebuah kapal layar. Layar SPN berbentuk segi tiga bersudut tegak, $MNPQ$ dan RSP ialah garis lurus.

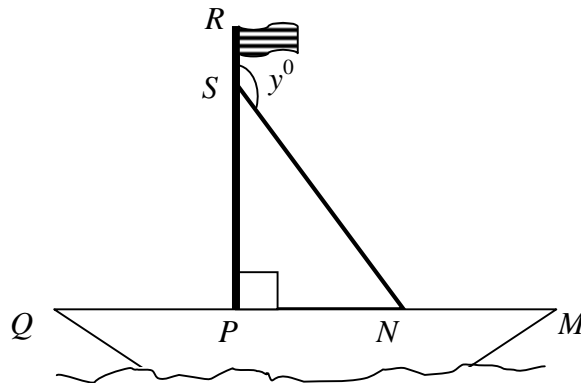


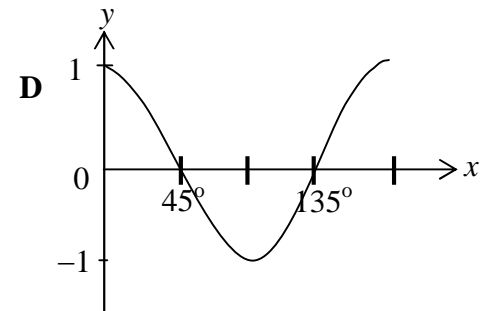
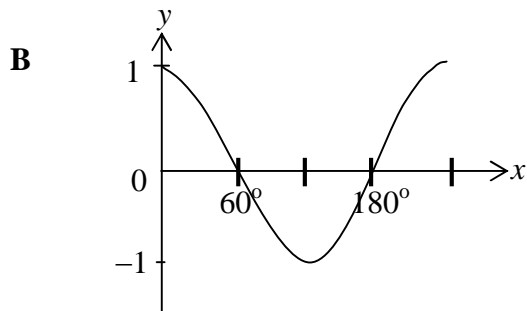
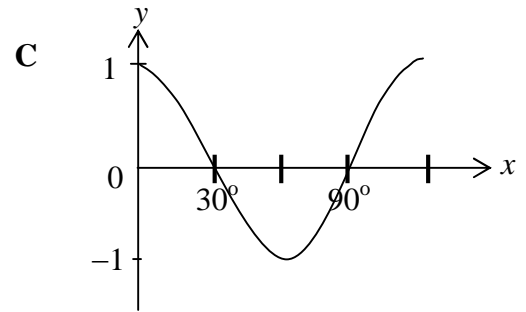
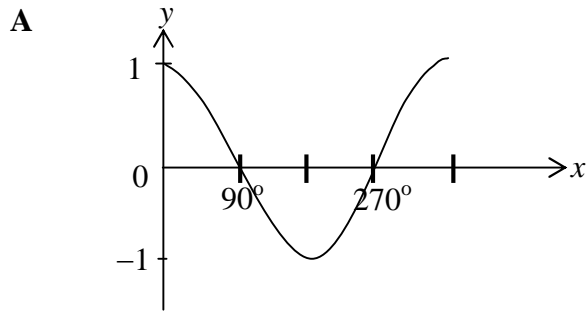
Diagram 5
Rajah 5

Given that $PN = 9$ m and $\cos y = -\frac{3}{5}$, find the height, in m, of SP .

Diberi $PN = 9$ m dan $\cos y = -\frac{3}{5}$, cari tinggi, dalam m, bagi SP .

- A 2.25
 B 6.75
 C 8.75
 D 11.25

- 13 Which graph represents part of $y = \cos 2x^\circ$?
 Graf manakah yang mewakili $y = \cos 2x^\circ$?



- 14 Diagram 6 shows a cuboid with rectangle $PQRS$ as its horizontal base.
 Rajah 6 menunjukkan sebuah kuboid dengan segiempat tepat $PQRS$ sebagai tapak mengufuk .

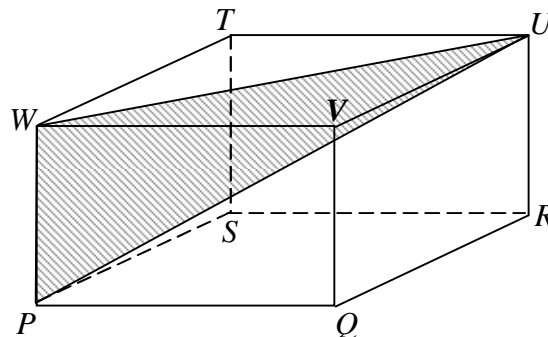


Diagram 6
 Rajah 6

Name the angle between the plane PWU and the plane $TURS$.
 Namakan sudut antara satah PWU dengan satah $TURS$.

- A** $\angle WUS$
B $\angle TUW$
C $\angle TWU$
D $\angle UWS$

- 15 Diagram 7 shows two vertical flags on a horizontal plane. P and Q are two points on the two flags.
Rajah 7 menunjukkan dua tiang bendera tegak di atas satah mengufuk. P dan Q adalah dua titik pada dua tiang bendera itu.

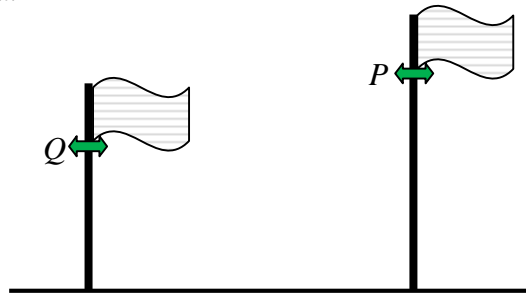


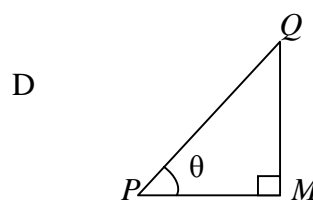
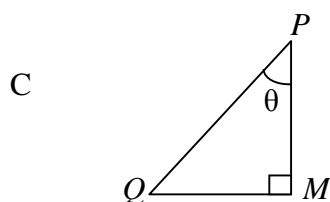
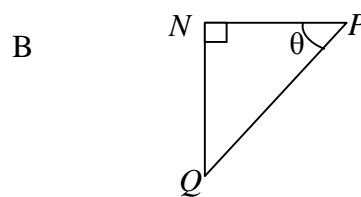
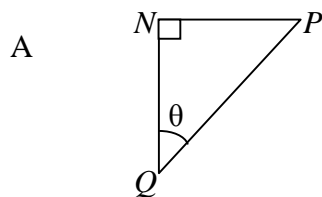
Diagram 7
Rajah 7

Point M is vertically below P , at the same level as Q . Point N is vertically above Q , at the same level as P .

Which diagram shows the angle of depression, θ , of point Q from point P

Titik M berada tegak di bawah P , pada paras yang sama dengan Q . Titik N berada tegak di atas Q , pada paras yang sama dengan P .

Rajah yang manakah menunjukkan sudut tunduk, θ titik Q dari titik P .



- 16 Diagram 8 shows a group of scouts in a camp. The angle of elevation of the kite from instructor's eye is 48° .

Rajah 8 menunjukkan sekumpulan pengakap di kawasan perkhemahan. Sudut dongak sebuah layang-layang dari mata jurulatih itu ialah 48°

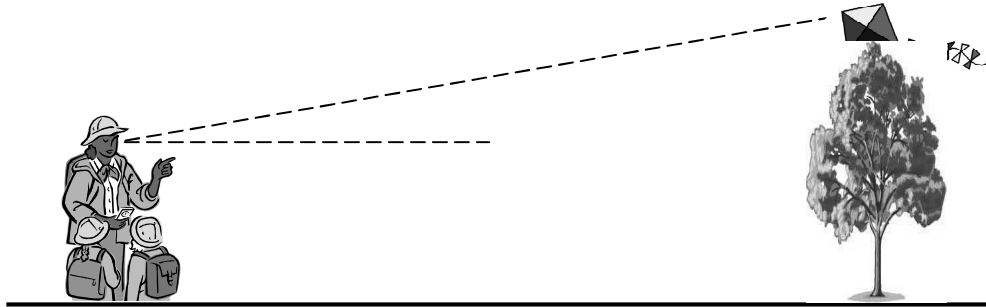


Diagram 8

Rajah 8

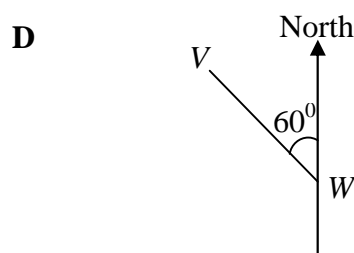
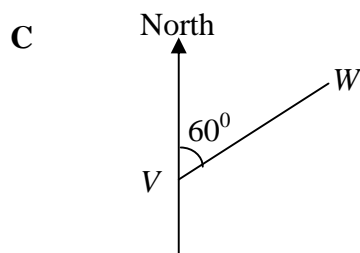
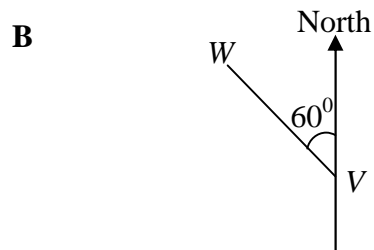
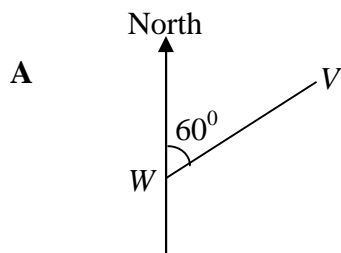
It is given that the base of the tree is 15 m from them and the kite are hang-up 30 m on the tree above the horizontal ground.

Calculate the eye level of the instructor, in m, from the ground.

Diberi jarak pokok adalah 15 m dari mereka dan layang-layang itu tersangkut 30 m tegak di atas pokok dari tanah mengufuk.

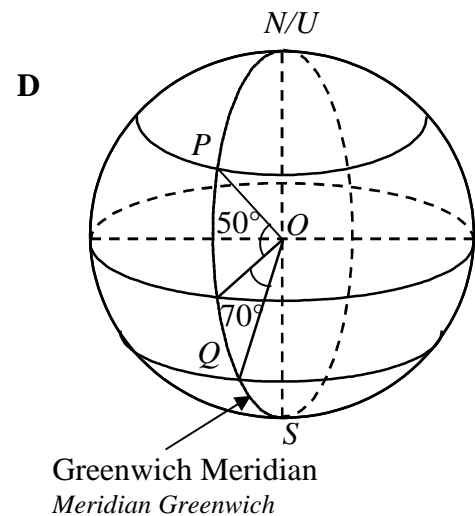
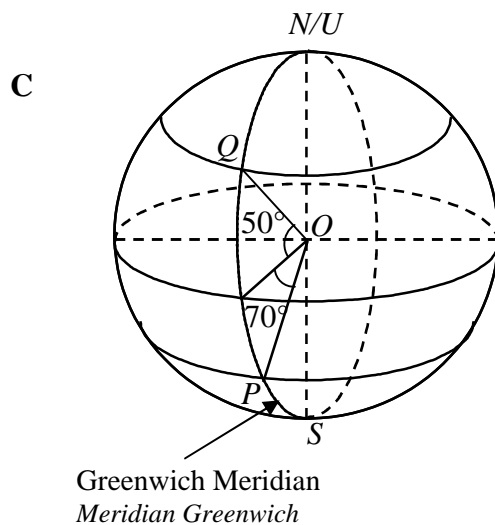
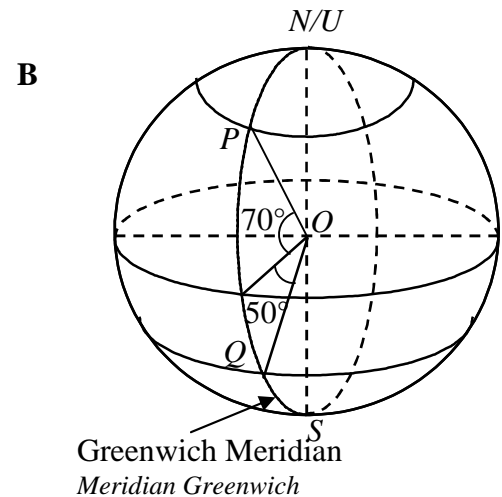
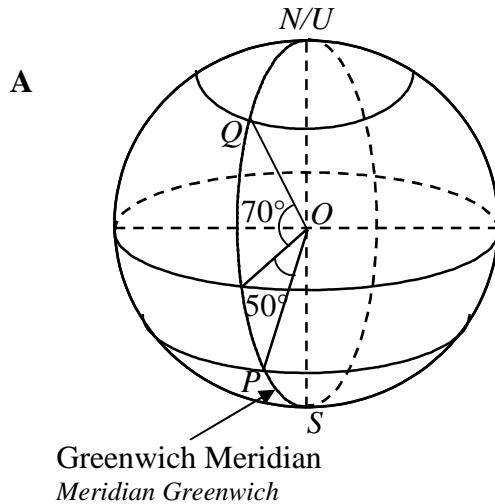
Hitung aras mata jurulatih, dalam m, dari tanah mengufuk.

- A 13.34
 B 13.51
 C 16.49
 D 16.65
- 17 Points W and V lie on a horizontal plane. The bearing of W from V is 060° . Which diagram shows the correct locations of W and V ?
- Diberi bahawa titik W dan titik V terletak pada suatu satah mengufuk. Bearing W dari V ialah 060° . Rajah manakah yang menunjukkan kedudukan yang betul bagi W dan V ?



- 18 N is the North Pole, S is the South Pole and O is the centre of the earth. P and Q are two points on the Greenwich Meridian. The latitude of P is $70^\circ N$ and the latitude of Q is $50^\circ S$. Which diagram shows the correct locations of P and Q ?

*U ialah Kutub Utara, S ialah Kutub Selatan dan O ialah pusat bumi. P dan Q ialah dua titik pada Meridian Greenwich. Latitud P ialah $70^\circ U$ dan latitud Q ialah $50^\circ S$.
Rajah manakah yang menunjukkan kedudukan yang betul bagi P dan Q?*



19 $n(n + m) - (n - m)^2 =$

- A $3nm - m^2$
 B $m^2 - nm$
 C $nm - m^2$
 D $m^2 - 3nm$

20 Express $\frac{4m+3}{5n} - \frac{2mn-6n}{10n^2}$ as a single fraction in its simplest form.

Ungkapkan $\frac{4m+3}{5n} - \frac{2mn-6n}{10n^2}$ sebagai pecahan tunggal dalam bentuk terendah.

A $\frac{3m+6}{5n}$

B $\frac{3m-6}{5n}$

C $\frac{m+2}{5n}$

D $\frac{m-2}{5n}$

21 Given that $3g = \frac{h-4}{2-h}$, express h in terms of g .

Diberi $3g = \frac{h-4}{2-h}$, ungkapkan h dalam sebutan g .

A $h = \frac{2g+4}{1+g}$

B $h = \frac{2g+4}{g-1}$

C $h = \frac{6g+4}{1+3g}$

D $h = \frac{6g-4}{3g-1}$

22 Given that $\frac{2p+1}{2} - \frac{5-p}{4} = 3$, find the value of p .

Diberi bahawa $\frac{2p+1}{2} - \frac{5-p}{4} = 3$, carikan nilai p .

A 2

B 3

C 5

D 6

23 $5^{-\frac{2}{3}} =$

A $-\frac{1}{\sqrt{5^3}}$

B $-\frac{1}{\sqrt[3]{5^2}}$

C $\frac{1}{\sqrt{5^3}}$

D $\frac{1}{\sqrt[3]{5^2}}$

24 Simplify :
Ringkaskan :

$$\frac{\left(2h^{\frac{3}{4}}k\right)^4}{h^{-4}k^5} =$$

A $\frac{2}{hk}$

B $\frac{2h^7}{k}$

C $\frac{16}{hk}$

D $\frac{16h^7}{k}$

25 List all the integer p that satisfy both the simultaneous linear inequalities $3p - 2 \geq 7$ and $p + 18 > 3p + 2$.

Senaraikan semua integer p yang memuaskan kedua-dua ketaksamaan linear serentak

$3p - 2 \geq 7$ dan $p + 18 > 3p + 2$

A 3, 4, 5, 6, 7

B 3, 4, 5, 6, 7, 8

C 4, 5, 6, 7

D 4, 5, 6, 7, 8

- 26 Diagram 9 is a pie chart which shows the number of members in three society in SMK Bestari Indah. The members of Science & Mathematics society are 45 students and the members of English society are 50 students.
Rajah 9 menunjukkan carta pai bagi bilangan ahli dalam tiga persatuan di SMK Bestari Indah. Ahli bagi persatuan Sains dan Matematik adalah seramai 45 orang dan ahli persatuan Bahasa Inggeris ialah 50 orang.

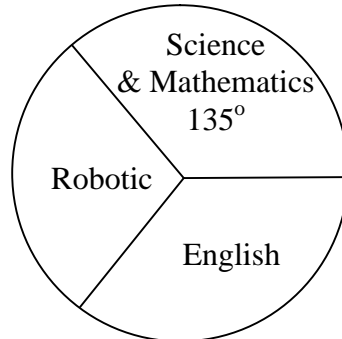


Diagram 9
Rajah 9

Find the number of students in Robotic society.
Cari bilangan ahli persatuan Robotik.

- A 10
 B 15
 C 25
 D 30
- 27 Diagram 10 is a bar chart which shows the scores of a group of students in a contest.
Rajah 10 ialah carta palang yang menunjukkan skor bagi sekumpulan murid dalam satu pertandingan.

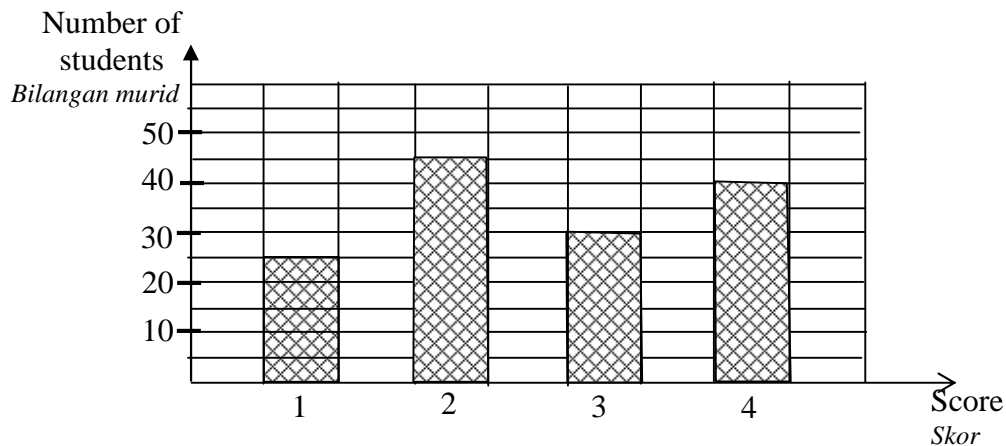


Diagram 10
Rajah 10

Determine the score mode.
Tentukan skor mod.

- A 2
 B 4
 C 40
 D 45

- 28 Diagram 11 show a graph function of $y = -x^n + m$, where m and n are integers.
Rajah 11 menunjukkan graf bagi fungsi $y = -x^n + m$, di mana m dan n ialah integer.

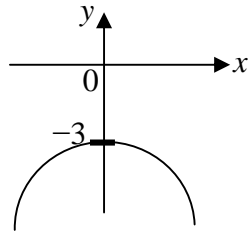
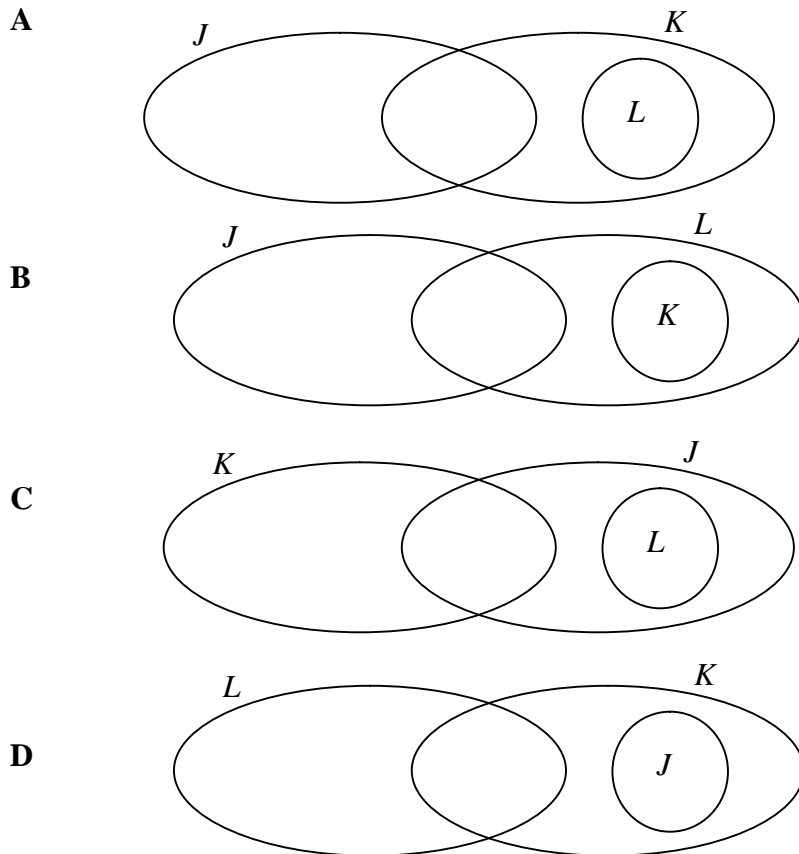


Diagram 11
Rajah 11

Determine the value of m and of n .
Tentukan nilai m dan nilai n .

- A $m = -3, n = -2$.
 B $m = 3, n = -2$.
 C $m = -3, n = 2$.
 D $m = 3, n = 2$.
- 29 It is given that the universal set, $\xi = J \cup K \cup L$, $J \subset K$ and $K \cap L \neq \emptyset$.
 Which Venn diagram represents these relationship?
*Diberi bahawa set semesta, $\xi = J \cup K \cup L$, $J \subset K$ dan $K \cap L \neq \emptyset$.
 Gambar rajah Venn manakah yang mewakili hubungan ini?*



- 30** It is given that the universal set $\xi = P \cup Q \cup R$, set $P = \{ a, c, e, g, h \}$, set $Q = \{ b, c, d, e, f \}$ and set $R = \{ a, b, d, h \}$.
List all the elements of set $P \cup (Q \cap R')$
Diberi bahawa set semesta, $\xi = P \cup Q \cup R$, set $P = \{ a, c, e, g, h \}$, set $Q = \{ b, c, d, e, f \}$ dan set $R = \{ a, b, d, h \}$.
Senaraikan semua unsur bagi set $P \cup (Q \cap R')$.

- A** $\{ c, e, g \}$
B $\{ c, e, g, f \}$
C $\{ a, c, e, g, h \}$
D $\{ a, c, e, f, g, h \}$

- 31** Diagram 12 is a Venn diagram showing the number of elements in sets K, L and M .
Given that $\xi = K \cup L \cup M$ and $n(K') = n(L \cap M)$.
Rajah 12 ialah sebuah gambar rajah Venn yang menunjukkan bilangan unsur dalam set K, L dan M .
Diberi $\xi = K \cup L \cup M$ dan $n(K') = n(L \cap M)$.

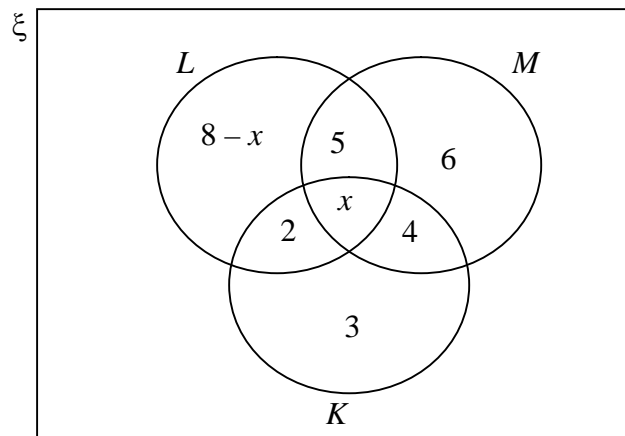


Diagram 12
Rajah 12

The value of x is
Nilai x ialah

- A** 4
B 5
C 7
D 9
- 32** Given that the straight line $2y + x = 6$ passes through the point $(p, -4)$.
Find the value of p .
Diberi bahawa garis lurus $2y + x = 6$ melalui titik $(p, -4)$.
Cari nilai bagi p .
- A** -14
B -5
C 5
D 14

- 33 Given that the straight line $y = 3x + 5$ is parallel to the straight line $2y + kx = 8$.
Find the value of k .

*Diberi bahawa garis lurus $y = 3x + 5$ adalah selari dengan garis lurus $2y + kx = 8$.
Cari nilai k .*

- A -6
B -3
C 3
D 6

- 34 Diagram 13 shows some alphabet cards.
Rajah 13 menunjukkan beberapa keping kad huruf.



Diagram 13
Rajah 13

A card is picked at random. Find the probability that a card with a consonant is picked.
Sekeping kad dipilih secara rawak. Cari kebarangkalian sekeping kad berharuf konsonan dipilih.

- A $\frac{2}{7}$
B $\frac{3}{7}$
C $\frac{4}{7}$
D $\frac{5}{7}$

- 35 A box contains 6 pieces of red cards, 8 pieces of yellow cards and x pieces of blue cards.
When a card is chosen at random from the box, the probability of getting a red card is $\frac{2}{7}$.

Find the value of x .

Sebuah kotak mengandungi 6 keping kad merah, 8 keping kad kuning dan x keping kad biru. Apabila sekeping kad dikeluarkan secara rawak daripada kotak itu, kebarangkalian kad merah diperolehi ialah $\frac{2}{7}$.

Cari nilai x

- A 2
B 5
C 7
D 14

- 36** w varies inversely as the cube root of y . Given that the constant is k , find the relation between w and y .
w berubah secara songsang dengan punca kuasa tiga y . Diberi k ialah pemalar, cari hubungan antara w dan y .

- A** $w = ky^3$
B $w = k\sqrt[3]{y}$
C $w = \frac{k}{y^3}$
D $w = \frac{k}{\sqrt[3]{y}}$

- 37** Given that $E \propto G$ such that $G = 2m - 1$ and $E = 6$ when $m = 5$, express E in terms of G .
Diberi $E \propto G$ dengan keadaan $G = 2m - 1$ dan $E = 6$ apabila $m = 5$, ungkapkan E dalam sebutan G .

- A** $E = 9G$
B $E = \frac{G}{9}$
C $E = \frac{2}{3}G$
D $E = \frac{3}{2}G$

- 38** Table 1 shows some values of the variables p , q and r such that p varies directly as q and inversely as the square root of r .
Jadual 1 menunjukkan sebahagian daripada pembolehubah-pembolehubah p , q dan r dengan keadaan p berubah secara langsung dengan q dan secara songsang dengan punca kuasadua r .

p	q	r
7	3	9
m	12	36

Table 1
 Jadual 1

Calculate the value of m .
 Hitung nilai m .

- A** $\frac{1}{2}$
B $\frac{7}{12}$
C 8
D 14

39 If $M - \begin{pmatrix} 2 & -3 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 4 & 0 \\ 2 & -1 \end{pmatrix}$, then matrix $M =$

Jika $M - \begin{pmatrix} 2 & -3 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 4 & 0 \\ 2 & -1 \end{pmatrix}$, maka matriks $M =$

A $\begin{pmatrix} -2 & -3 \\ -1 & 1 \end{pmatrix}$

B $\begin{pmatrix} 2 & 3 \\ 1 & -1 \end{pmatrix}$

C $\begin{pmatrix} 6 & -1 \\ 1 & -1 \end{pmatrix}$

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

40 $(2 \ -1) \begin{pmatrix} -3 & 5 \\ 2 & -2 \end{pmatrix} =$

A $\begin{pmatrix} -11 & 8 \end{pmatrix}$

B $\begin{pmatrix} -8 & 12 \end{pmatrix}$

C $\begin{pmatrix} -11 \\ 8 \end{pmatrix}$

D $\begin{pmatrix} -8 \\ 12 \end{pmatrix}$

END OF QUESTION PAPER

PERATURAN PEMARKAHAN MATEMATIK KERTAS 1 1449/1

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

1449/2

Mathematics

Kertas 2

2013

 $2\frac{1}{2}$ jam

NAMA

TINGKATAN



SMK KAMPUNG GELAM, MELAKA
PEPERIKSAAN PERCUBAAN SPM

TAHUN 2013

MATHEMATICS

Kertas 2

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis nama dan kelas anda pada ruang yang disediakan.

2. Kertas soalan ini adalah dalam dwibahasa.

3. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.

4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.

5. Kertas soalan ini mengandungi dua bahagian:
Bahagian A dan Bahagian B.

6. Jawab **semua** soalan dalam **Bahagian A** dan mana – mana **empat** soalan daripada **Bahagian B**

7. Tulis jawapan anda pada ruang yang disediakan dalam kertas soalan ini.

8. Rajah yang mengiringi soalan **tidak dilukis** mengikut skala kecuali dinyatakan.

9. Satu senarai rumus disediakan di halaman 2 dan 3.

10. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

Bahagian	Soalan	Markah Penuh	Markah diperolehi
A	1	3	
	2	4	
	3	4	
	4	3	
	5	5	
	6	5	
	7	4	
	8	6	
	9	6	
	10	6	
	11	6	
B	12	12	
	13	12	
	14	12	
	15	12	
	16	12	
Total			

Kertas soalan ini mengandungi 24 halaman bercetak

MATHEMATICAL FORMULAE

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

RELATIONS

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

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

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

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

$$5 \quad P(A) = \frac{n(A)}{n(S)}$$

$$6 \quad P(A') = 1 - P(A)$$

$$7 \quad \text{Distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$8 \quad \text{Midpoint } (x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$9 \quad \text{Average speed} = \frac{\text{distance travelled}}{\text{time taken}}$$

$$10 \quad \text{Mean} = \frac{\text{sum of data}}{\text{number of data}}$$

$$11 \quad \text{Mean} = \frac{\text{sum of (class mark} \times \text{frequency)}}{\text{sum of frequency}}$$

$$12 \quad \text{Pythagoras Theorem} \\ c^2 = a^2 + b^2$$

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

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

SHAPES AND SPACE

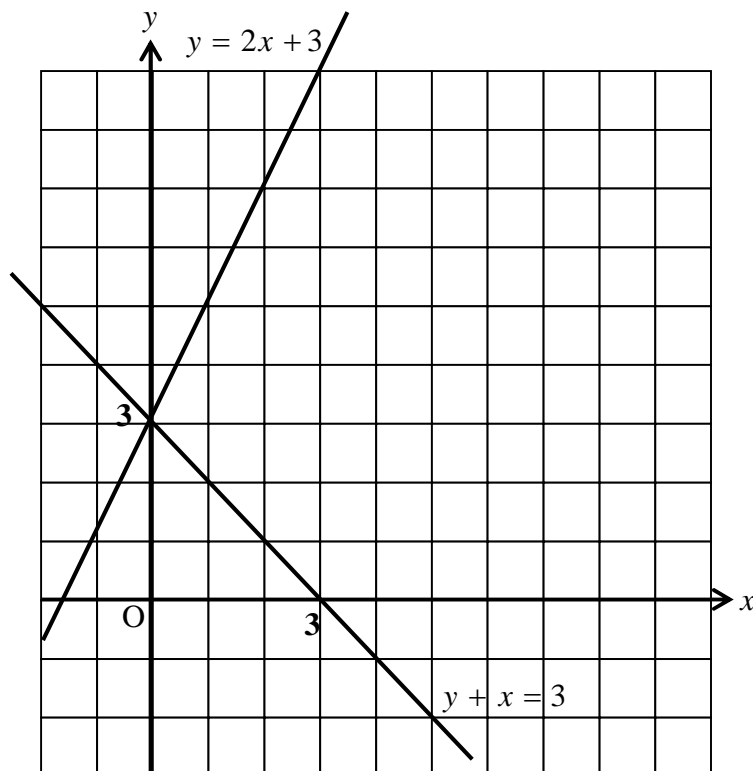
- 1 Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
- 2 Circumference of circle = $\pi d = 2\pi r$
- 3 Area of circle = πr^2
- 4 Curved surface area of cylinder = $2\pi rh$
- 5 Surface area of sphere = $4\pi r^2$
- 6 Volume of right prism = cross sectional area \times length
- 7 Volume of cylinder = $\pi r^2 h$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
- 11 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
- 12
$$\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at center}}{360^\circ}$$
- 13
$$\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 14 Scale factor, $k = \frac{PA'}{PA}$
- 15 Area of image = $k^2 \times \text{area of object}$

Section A
[52 marks]

Answer **all** questions in this section.

- 1 On the graph in the answer space, shade the region which satisfy the three inequalities $y + x \geq 3$, $y \leq 2x + 3$ and $x < 3$.
 Pada ruang jawapan yang disediakan, lorekkan rantau yang memuaskan ketiga-tiga ketaksamaan $y + x \geq 3$, $y \leq 2x + 3$ dan $x < 3$. [3 marks]

Answer :



- 2 Calculate the value of p and of q that satisfy the following simultaneous linear equations:

Hitung nilai p dan nilai q yang memuaskan persamaan linear serentak berikut :

$$\frac{1}{2}p + 3q = 5$$

$$p - 4q = -20$$

Answer:

[4 marks]

- 3 Solve the following quadratic equation:

Selesaikan persamaan kuadrat berikut:

$$4n(n + 1) = 2 - 3n$$

Answer:

[4 marks]

- 4 Diagram 4 shows a right prism with a horizontal rectangular base $EFGH$. Trapezium $EHJK$ is the uniform cross section of the prism.

Rajah 4 menunjukkan sebuah prisma tegak dengan tapak segi empat tepat $EFGH$ di atas satah mengufuk. Trapezium $EHJK$ adalah keratan rentas seragam prisma itu.

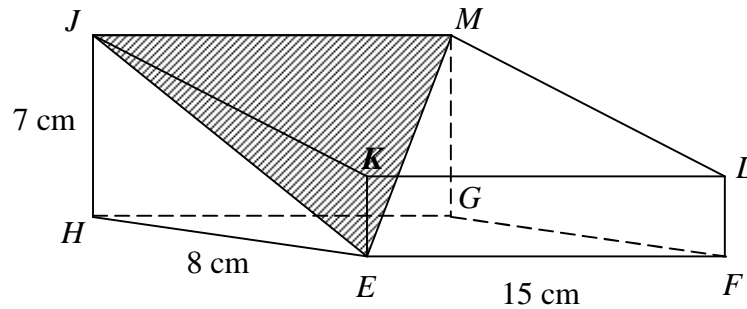


Diagram 4
Rajah 4

- (a) Name the angle between the plane JEM and the plane $JHGM$.
Namakan sudut di antara satah JEM dengan satah $JHGM$.
- (b) Hence, calculate the angle between the plane JEM and the plane $JHGM$.
Seterusnya, hitungkan sudut di antara satah JEM dengan satah $JHGM$. [3 marks]

Answer :

- (a)
- (b)

5 (a) Determine whether each of the following sentences is a statement or non-statement.
Tentukan sama ada setiap ayat berikut adalah satu pernyataan atau bukan pernyataan.

(i) $2 + 5 = 10$

(ii) $3 + x = 7$

(b) Complete the following statement using the quantifier “all” or “some”, to make it a false statement .

Lengkapkan pernyataan berikut dengan menggunakan pengkuantitian “semua” atau “sebilangan”, untuk membentuk suatu pernyataan palsu.

..... hexagon have six sides.
..... heksagon mempunyai enam sisi.

(c) It is given that the volume of a sphere is $\frac{4}{3}\pi r^3$, where r is the radius of the sphere.

Make **one** conclusion by deduction on the volume of a sphere with radius 6 cm.

Diberi bahawa isipadu sebuah sfera adalah $\frac{4}{3}\pi j^3$, di mana j ialah jejari sfera.

*Buat **satu** kesimpulan secara deduksi tentang isipadu sfera yang mempunyai jejari 6 cm.*

(Use / Guna $\pi = 3.142$)

[5 marks]

Answer:

(a) (i)

(ii)

(b)

.....

(c)

.....

- 6 In Diagram 6, O is the origin. Point Q lies on the y -axis. QR is parallel to the x -axis and straight line RS is parallel to straight line PQ . The equation of straight line PQ is $x + 3y = 12$.

Dalam Rajah 6, O ialah asalan. Titik Q terletak di atas paksi- y . QR adalah selari dengan paksi- x dan garis lurus RS adalah selari dengan garis lurus PQ . Persamaan garis lurus PQ ialah $x + 3y = 12$.

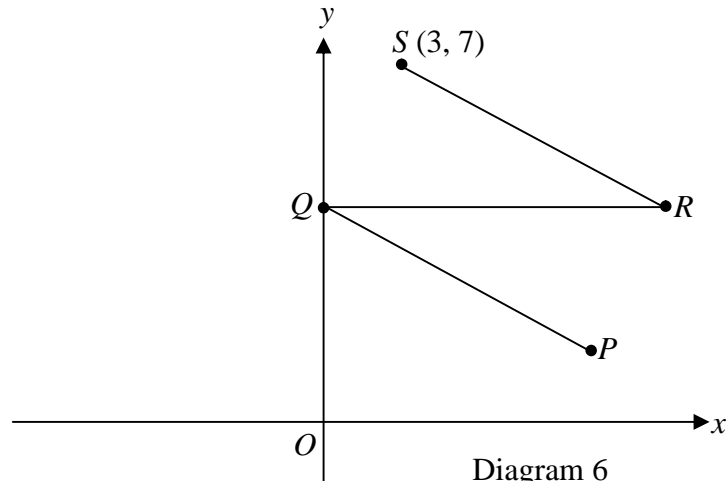


Diagram 6
Rajah 6

- (a) State the equation of the straight line QR .
Nyatakan persamaan garis lurus QR .
- (b) Find the equation of the straight line RS and hence, state its y -intercept.
Cari persamaan garis lurus RS dan seterusnya nyatakan pintasan $-y$ nya.

[5 marks]

Answer :

(a)

(b)

- 7 Diagram 7 shows a cone with a diameter of 16 cm. A hemisphere of radius 6 cm is removed from the cone.

Rajah 7 menunjukkan sebuah kon yang mempunyai diameter 16 cm. Sebuah hemisfera yang berjari 6 cm dikeluarkan daripada kon itu.

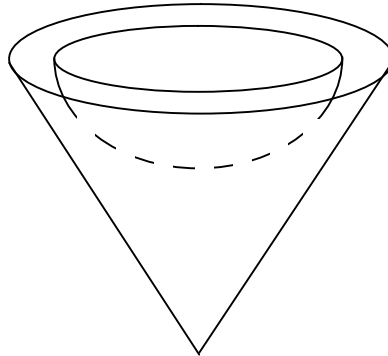


Diagram 7
Rajah 7

Given that the volume of the remaining solid is $150\frac{6}{7} \text{ cm}^3$. Using $\pi = \frac{22}{7}$, calculate the height, in cm, of the cone.

Diberi bahawa isipadu pepejal yang tinggal ialah $150\frac{6}{7} \text{ cm}^3$. Menggunakan $\pi = \frac{22}{7}$, hitung tinggi, dalam cm, kon itu.

[4 marks]

Answer:

- 8 (a) Given that $k \begin{pmatrix} -1 & m \\ -2 & 5 \end{pmatrix} \begin{pmatrix} 5 & 3 \\ 2 & -1 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, find the value of m and of k .

Diberi bahawa $k \begin{pmatrix} -1 & m \\ -2 & 5 \end{pmatrix} \begin{pmatrix} 5 & 3 \\ 2 & -1 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, cari nilai m dan nilai k .

- (b) Write the following simultaneous linear equations as matrix equation:
Tulis persamaan linear serentak berikut dalam bentuk persamaan matriks.

$$5x + 3y = 4$$

$$2x - y = -5$$

Hence, using matrix method, calculate the value of x and of y .

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

[6 marks]

Answer :

(a)

(b)

- 9 Diagram 9 shows sector MUR , sector MTS and semicircle PQU with centre M .
Rajah 9 menunjukkan sektor MUR , sektor MTS dan semibulatan PQU yang berpusat di M .

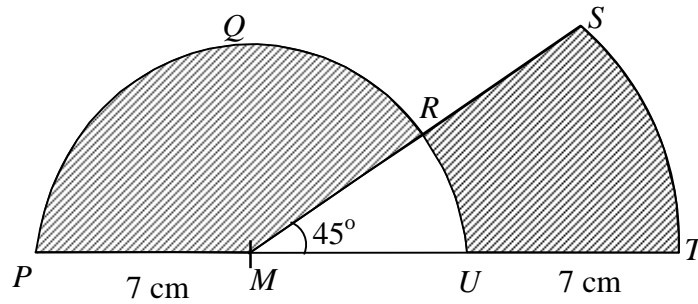


Diagram 9
Rajah 9

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

Dengan menggunakan $\pi = \frac{22}{7}$, hitung

- (a) the perimeter, in cm, of the whole diagram.
perimeter, dalam cm, seluruh rajah.
- (b) the area, in cm^2 , of the shaded region.
luas, dalam cm^2 , kawasan berlorek.

[6 marks]

Answer:

(a)

(b)

- 10** Table 10 shows the name of teachers from a Technical School and a Boarding School attending a singing contest for 2012 Teacher's Day.

Jadual 10 menunjukkan nama guru-guru daripada Sekolah Teknik dan Sekolah Berasrama yang menghadiri satu pertandingan nyanyian untuk Hari Guru 2012.

	Male <i>Lelaki</i>	Female <i>Wanita</i>
Technical School <i>Sekolah Teknik</i>	Hassan Yoges	Meena Zaharah
Boarding School <i>Sekolah Berasrama</i>	Osman	Leesa Rohaya Wati

Table 10
Jadual 10

Two teachers are required to sing an English song.

Dua orang guru dikehendaki untuk menyanyikan sebuah lagu Inggeris.

- (a) A teacher is chosen at random from the Boarding School and then another teacher is chosen at random also from the Boarding School.

Seorang guru dipilih secara rawak daripada Sekolah Berasrama dan kemudian seorang guru lagi dipilih secara rawak juga daripada Sekolah Berasrama.

- (i) List all the possible outcomes of the event in this sample space.
Senaraikan semua kesudahan peristiwa yang mungkin dalam ruang sampel ini.
- (ii) Hence, find the probability that a male teacher and a female teacher are chosen.
Seterusnya, cari kebarangkalian bahawa seorang guru lelaki dan seorang guru wanita dipilih.

- (b) A teacher is chosen at random from the male group and then another teacher is chosen at random from the female group.

Seorang guru dipilih secara rawak daripada kumpulan guru lelaki dan kemudian seorang guru lagi dipilih secara rawak daripada kumpulan guru wanita.

- (i) List all the possible outcomes of the event in this sample space.
Senaraikan semua kesudahan peristiwa yang mungkin dalam ruang sampel ini.
- (ii) Hence, find the probability that both teachers chosen are from the Technical School.
Seterusnya, cari kebarangkalian bahawa kedua-dua guru yang dipilih adalah daripada Sekolah Teknik.

[6 marks]

Answer :

- (a) (i)

- (ii)

- (b) (i)

- (ii)

- 11 Diagram 11 shows the distance-time graph for the journey of car and a bus, for the period of t seconds. The graph PRS represents the journey of the car and the graph $PQRT$ represents the journey of the bus. Both vehicles start at the same location and move along the same route.

Rajah 11 menunjukkan graf jarak – masa bagi perjalanan sebuah kereta dan sebuah bas, dalam tempoh t saat. Graf PRS mewakili perjalanan kereta dan graf $PQRT$ mewakili perjalanan bas. Kedua – dua kenderaan bermula dari lokasi yang sama dan melalui laluan yang sama.

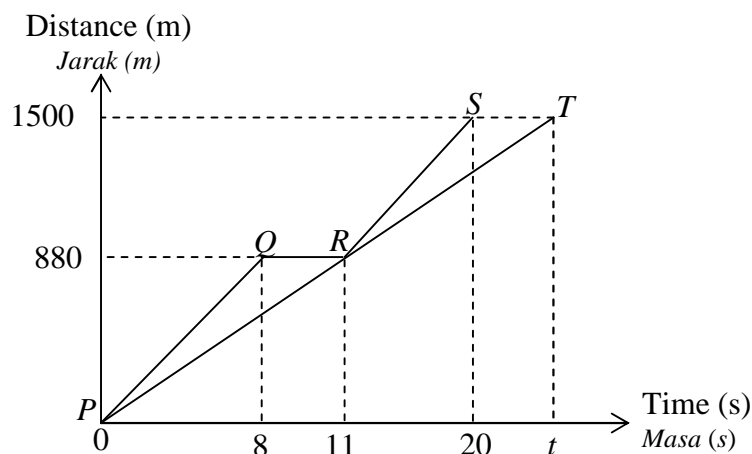


Diagram 11
Rajah 11

- (a) State the time, in seconds, that both vehicles are at the same location.
Nyatakan masa, dalam saat, di mana kedua – dua kenderaan berada di satu lokasi yang sama.
- (b) Calculate the rate of change of distance, in ms^{-1} , of the car in the first 11 seconds.
Hitung kadar perubahan jarak, dalam ms^{-1} , bagi kereta itu dalam 11 saat yang pertama.
- (c) If the average speed of the whole journey of the car is three times the average speed of the whole journey of the bus, find, in seconds, the value of t .
Jika purata laju keseluruhan perjalanan kereta itu adalah tiga kali ganda purata laju keseluruhan perjalanan bas, cari, dalam saat, nilai bagi t .

[6 marks]

Answer :

- (a)
- (b)
- (c)

Section B
[48 marks]

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 $y = -\frac{18}{x}$ by writing down the values of y when $x = -4$ and $x = 1.5$.

Lengkapkan Jadual 12 di ruang jawapan bagi persamaan $y = -\frac{18}{x}$ dengan menulis nilai-nilai y apabila $x = -4$ dan $x = 1.5$.

[2 marks]

- (b) For this part of the question, use the graph paper provided on page 16. You may use a flexible curve rule.

Untuk ceraihan soalan ini, gunakan kertas graf yang disediakan pada halaman 16. 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 $y = -\frac{18}{x}$ for $-4 \leq x \leq 4$.

[4 marks]

Menggunakan skala 2 cm kepada 1 unit pada paksi- x dan 2 cm kepada 5 unit pada paksi- y , lukis graf bagi $y = -\frac{18}{x}$ untuk $-4 \leq x \leq 4$.

- (c) From the graph in 12(b), find
Dari graf 12(b), cari

(i) the value of y when $x = 2.3$
nilai y apabila $x = 2.3$

(ii) the value of x when $y = 11$
nilai x apabila $y = 11$

[2 marks]

- (d) Draw a suitable straight line on the graph in 12(b) to find all the values of x which satisfy the equation $4x^2 - 8x = 18$ 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 semua nilai x yang memuaskan persamaan $4x^2 - 8x = 18$ untuk $-4 \leq x \leq 4$.

Nyatakan nilai-nilai x itu.

Answer:

(a)

x	-4	-3	-2	-1	1	1.5	2	3	4
y		6	9	18	-18		-9	-6	-4.5

Table 12
Jadual 12

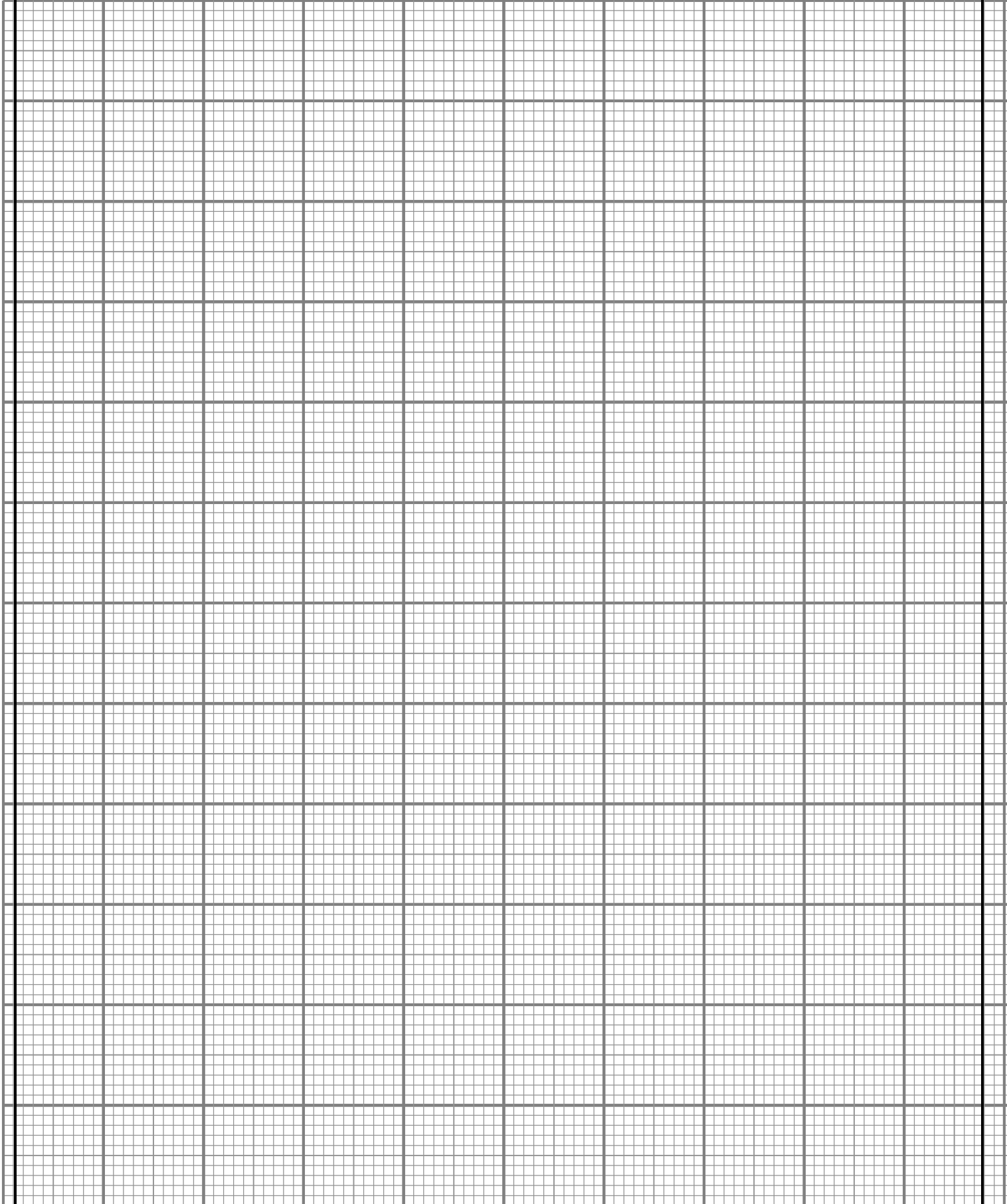
(b) Refer graph on page 16.
Rujuk graf pada halaman 16.

(c) (i) $y =$

(ii) $x =$

(d) $x =$,

Graph for Question 12



- 13 Diagram 13.1 shows points $J(3, 2)$ and straight line $y - x = 2$ drawn on a Cartesian plane.

Rajah 13.1 menunjukkan titik $J(3, 2)$ dan garis $y - x = 2$ dilukis pada suatu satah Cartesian.

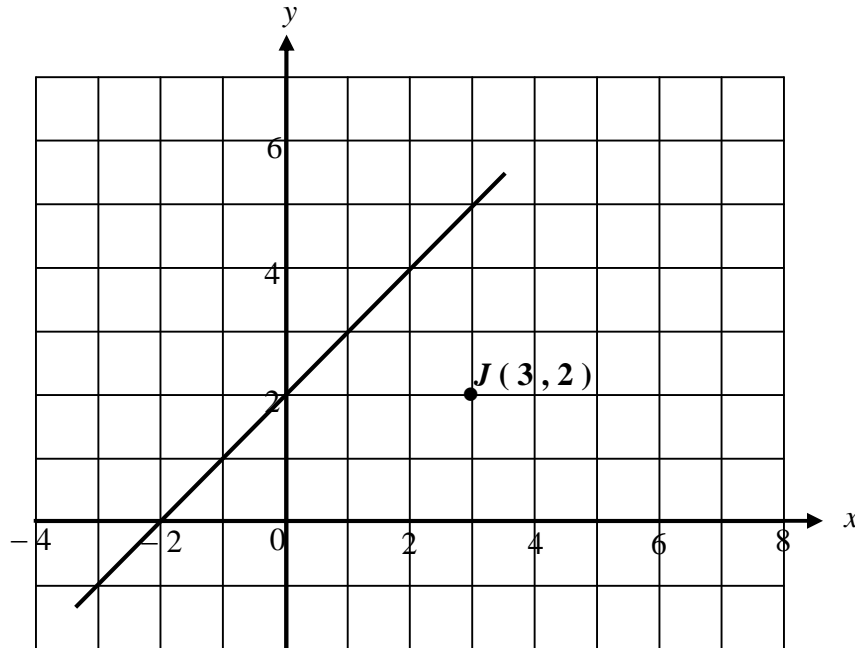


Diagram
13.1

- (a) Transformation **P** is a reflection in the line $y - x = 2$.
Penjelmaan **P** ialah satu pantulan pada garis $y - x = 2$.

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

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

State the coordinates of the image of point J under each of the following transformations:

Nyatakan koordinat imej bagi titik J di bawah setiap penjelmaan berikut:

- (i) **T**
(ii) **TP**

[3 marks]

Answer:

- (a) (i)

- (ii)

- (b) Diagram 13.2 shows two trapeziums, $KLMJ$ and $PQLR$ drawn on a Cartesian plane.
Rajah 13.2 menunjukkan dua trapezium $KLMJ$ dan $PQLR$ dilukis pada suatu satah Cartesian.

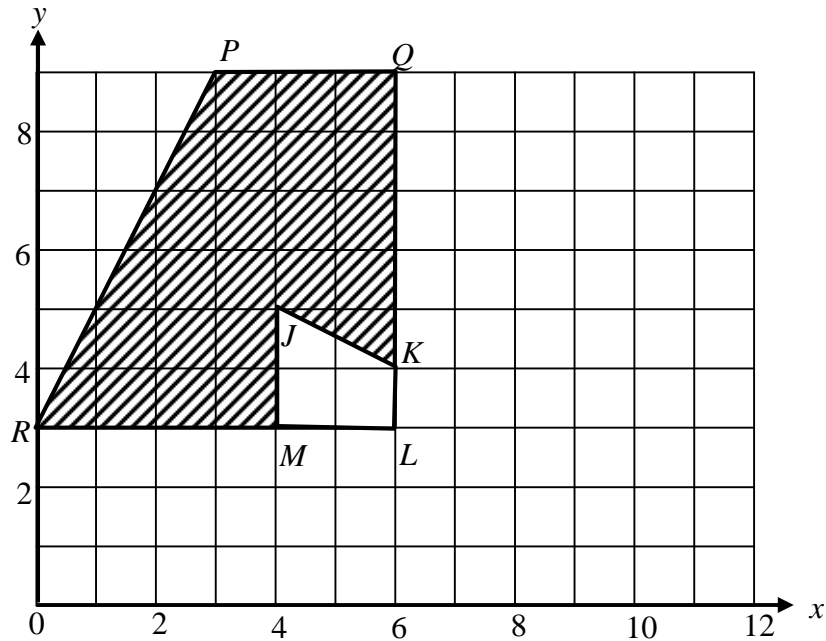


Diagram 13.2
Rajah 13.2

- (i) $PQLR$ is the image of $KLMJ$ under the combined transformation VU .
 Describe in full the transformation :
 $PQLR$ ialah imej bagi $KLMJ$ di bawah gabungan penjelmaan VU . Huraikan selengkapnya penjelmaan:
- (a) U ,
 (b) V .
- (ii) It is given that $KLMJ$ represents a region of area 60 m^2 . Calculate the area, in m^2 , of the region represented by the shaded region.
Diberi bahawa $KLMJ$ mewakili suatu kawasan yang mempunyai luas 60 m^2 . Hitung luas, dalam m^2 , yang diwakili oleh kawasan yang berlorek.

[9 marks]

Answer:

- (i) (a) U :
-
- (b) V :
-

- (ii)

- 14** The data in Diagram 14 shows the masses, in kg, of luggage for a group of 40 tourist.
Data dalam Rajah 14 menunjukkan jisim ,dalam kg, bagasi bagi sekumpulan 40 orang pelancong.

10	35	12	26	18	33	29	23
33	23	31	28	14	23	17	27
20	17	35	29	34	38	15	24
26	20	26	36	22	21	30	34
32	24	11	16	22	35	19	28

Diagram 14
Rajah 14

- (a) Based on the data, complete Table 14 in the answer space. [4 marks]
Berdasarkan data itu, lengkapkan Jadual 14 di ruangan jawapan.
- (b) Based on Table 14 in (a), calculate the mean mass of the luggage. [3 marks]
Berdasarkan Jadual 14 di (a), hitungkan min anggaran jisim bagi bagasi.
- (c) By using a scale of 2 cm to 5 kg on the horizontal axis and 2 cm to 1 tourist on the vertical axis, draw a frequency polygon for the data. [4 marks]
Dengan menggunakan skala 2 cm kepada 5 kg pada paksi mengufuk dan 2 cm kepada 1 orang pelancong pada paksi mencancang, lukiskan satu poligon kekerapan bagi data tersebut.
- (d) Based on the frequency polygon in 14(c), state the number of tourist who have the luggage mass is more than 30 kg. [1 marks]
Berdasarkan poligon kekerapan di 14(c), nyatakan bilangan pelancong yang mempunyai bagasi berjisim lebih daripada 30 kg.

Answer :

(a)

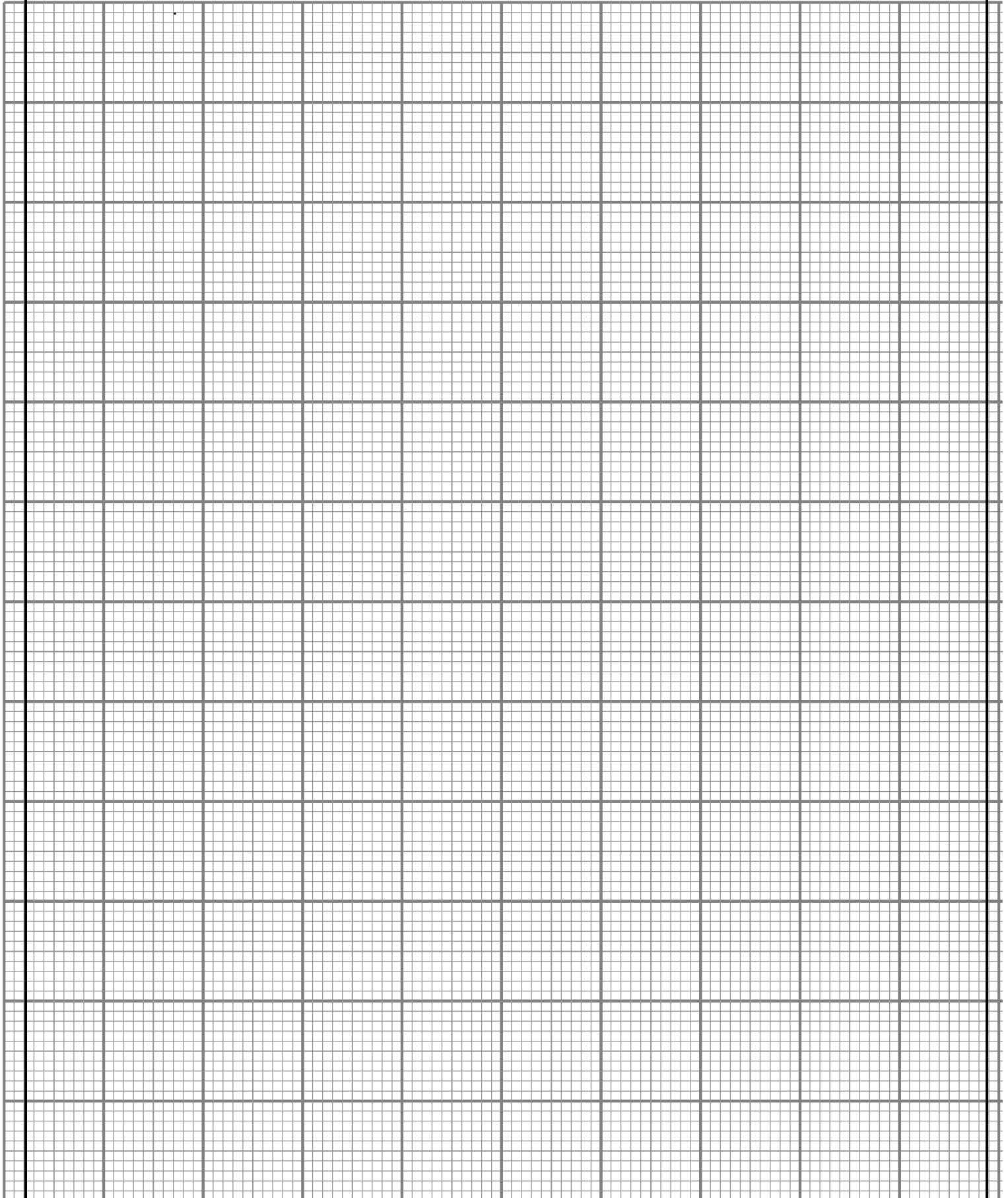
Class interval	Frequency	Midpoint
10 – 14		

Table 14
Jadual 14

(b)

(d)

Graph for Question 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 15(i) shows a solid right prism with rectangular base $ABCD$ on a horizontal table. $ABLMGF$ is its uniform cross section. The rectangle $ADEF$ is an inclined plane and the rectangles $EFGH$ and $JKLM$ are horizontal. GM , HJ , LB and CK are vertical edges. $HJ = KC = 3$ cm, $EH = JK = 2$ cm.
Rajah 15(i) menunjukkan sebuah pepejal prisma tegak dengan tapak segi empat tepat $ABCD$ di atas meja yang mengufuk. $ABLMGF$ adalah keratan rentas seragamnya. Segiempat tepat $ADEF$ ialah satah condong dan segiempat tepat $EFGH$ dan $JKLM$ adalah satah mengufuk. GM , HJ , LB dan CK adalah sisi-sisi tegak. $HJ = KC = 3$ cm, $EH = JK = 2$ cm.

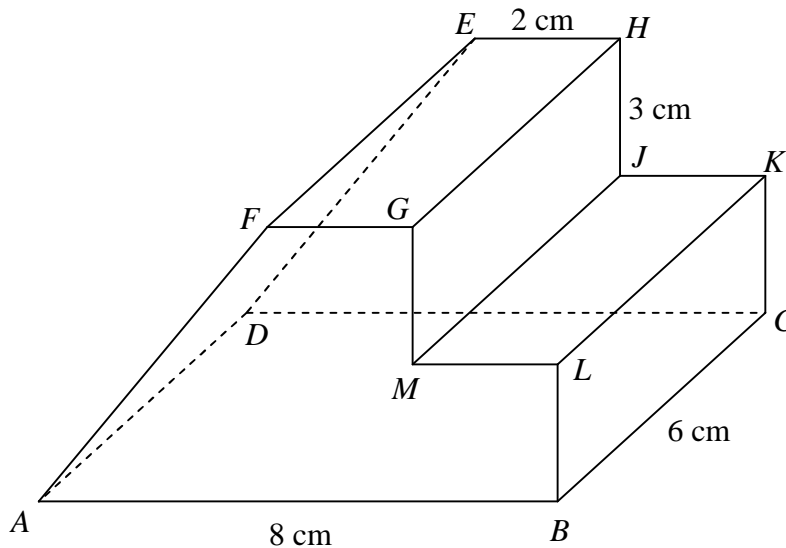


Diagram 15(i)
Rajah 15(i)

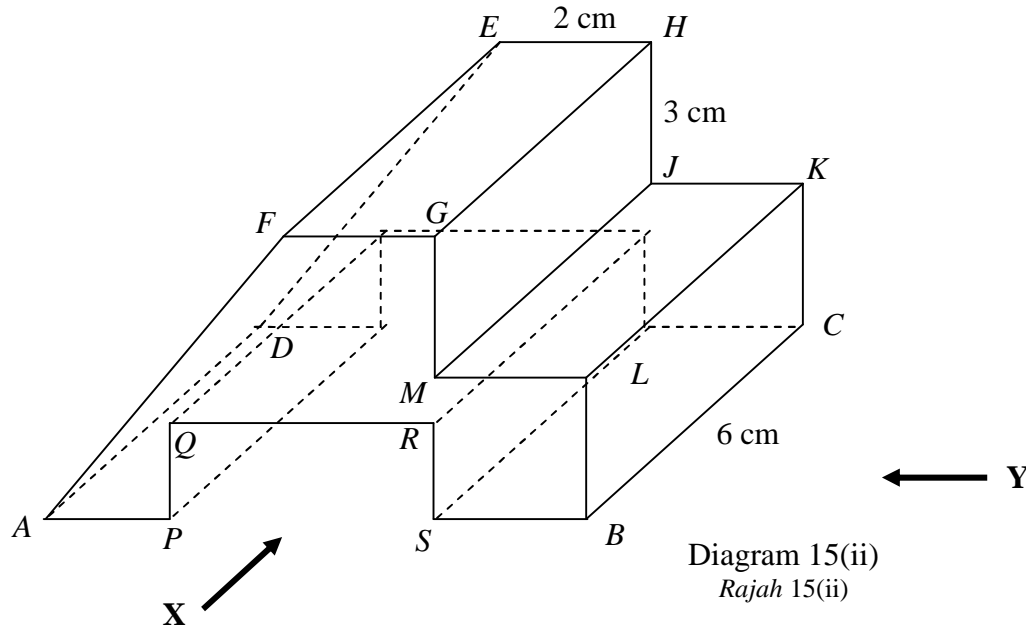
Draw to full scale the plan of the solid.
Lukis dengan skala penuh pelan pepejal itu.

[3 marks]

- Answer :
(a)

- (b) A solid in the form of a cuboid is bored and taken out from the solid in Diagram 15(i). The remaining solid is as shown in Diagram 15(ii). $QR = 4$ cm, $RS = 2$ cm and $AP = 2$ cm.

Sebuah pepejal berbentuk kuboid dikorek dan dikeluarkan daripada pepejal di Rajah 15(i). Baki pepejal yang tinggal itu ditunjukkan dalam Rajah 15(ii). $QR = 4$ cm, $RS = 2$ cm and $AP = 2$ cm.



Draw to full scale

Lukis dengan skala penuh

- (i) the elevation of the solid on a vertical plane parallel to AB as viewed from X .

dongakan pepejal itu pada satah tegak yang selari dengan AB seperti yang dilihat dari X .

[4 marks]

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

[5 marks]

dongakan gabungan pepejal itu pada satah tegak yang selari dengan BC seperti yang dilihat dari Y .

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

- 16** $D(30^{\circ}N, 50^{\circ}W)$, $F(30^{\circ}N, 25^{\circ}W)$, G and H are four points on the surface of the earth.
 DG is a diameter of the earth.
 $D(30^{\circ}U, 50^{\circ}B)$, $F(30^{\circ}U, 25^{\circ}B)$, G dan H adalah empat titik di permukaan bumi. DG ialah diameter bumi.

- (a) State the location of point G . [2 marks]
Nyatakan kedudukan titik G .
- (b) Calculate the shortest distance, in nautical miles, from D to the North Pole measured along the surface of the earth. [3 marks]
Hitung jarak terpendek, dalam batu nautika, dari D ke Kutub Utara diukur sepanjang permukaan bumi.
- (c) H is 5400 nautical miles due south of F measured along the surface of the earth. Calculate the latitude of H . [4 marks]
 H terletak 5400 batu nautika ke selatan F diukur sepanjang permukaan bumi. Hitung latitud H .
- (d) An aeroplane took off from D and flew due west to F and then flew due south to H . The average speed for the whole flight was 450 knots. Calculate the total time, in hours, taken for the whole flight. [3 marks]

*Sebuah kapal terbang berlepas dari D dan terbang ke arah barat ke F dan kemudian ke arah selatan menuju ke H . Purata laju kapal terbang bagi keseluruhan penerbangan itu ialah 450 knot.
 Hitung jumlah masa, dalam jam, yang diambil bagi keseluruhan penerbangan itu.*

Answer :

(a)

(b)

(c)

(d)

END OF QUESTION PAPER

Nota :

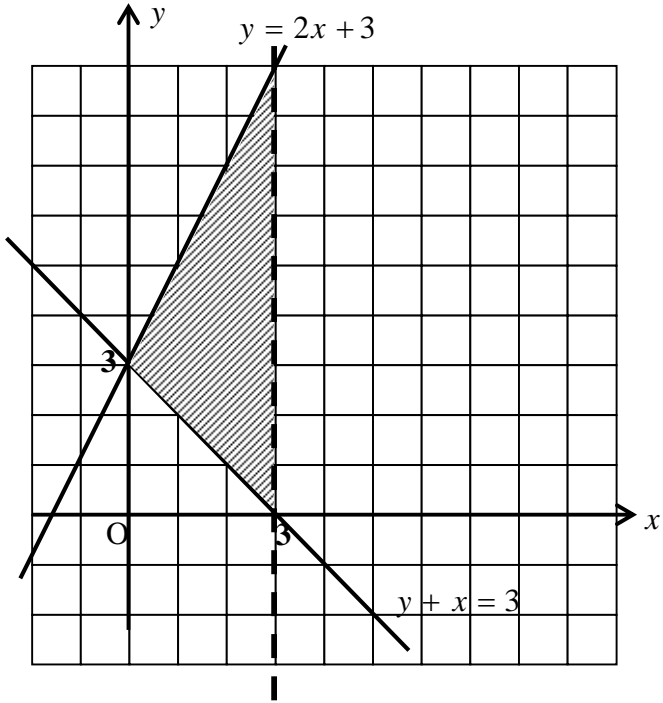
JUMLAH MARKAH (100%) :**KERTAS 1(40%) + KERTAS 2 (100%)**

$$\text{Keseluruhan Markah} = \left(\frac{\text{ker tas 1} + \text{ker tas 2}}{140} \right) \times 100$$

Peraturan ini adalah untuk panduan guru sahaja.

Terima Kasih

MARKAH MAKSIMUM BAGI KERTAS INI : 100 MARKAH

No	Peraturan Pemarkahan	Markah	
1	 <p data-bbox="1070 1070 1230 1137">Dashed line for $x = 3$</p> <p data-bbox="1082 1216 1201 1323">Region correctly shaded</p>	1	
			3
2	$p = -20 + 4q \text{ or } p + 6 = 10$ $5q = 15 \text{ or } 10q = 30$ $q = 3$ $p = -8$	1 1 1 1	
3	$4n^2 + 7n - 2 = 0$ $(4n - 1)(n + 2) = 0$	1 1	

No	Peraturan Pemarkahan	Markah	
	$n = \frac{1}{4}, n = -2$	1,1	4
4	$\angle HJE$ or $\angle EJH$ $\tan \angle HJE = \frac{8}{7}$ $\angle HJE = 48.81^\circ$ or $48^\circ 48'$	1 1 1	 3
5	(a) (i) Statement (ii) Non-statement (b) all (c) The volume of a sphere with radius a radius of 6 cm is $\frac{4}{3}(3.142)(6^3) = 904.896 \text{ cm}^3$.	1 1 1 2	 5
6	(a) $y = 4$ (b) $m = -\frac{1}{3}$ $7 = -\frac{1}{3}(3) + c$ $y = -\frac{1}{3}x + 8$ $y_{\text{int}} = 8$	1 1 1 1 1	 5
7	$V_{\text{cone}} = \frac{1}{3} \times \frac{22}{7} \times 8 \times 8 \times h$ $V_{\text{hemisphere}} = \frac{1}{2} \times \frac{4}{3} \times \frac{22}{7} \times 6^3$ $\frac{1}{3} \times \frac{22}{7} \times 8 \times 8 \times h - \frac{1}{2} \times \frac{4}{3} \times \frac{22}{7} \times 6^3 = 150\frac{6}{7}$ $h = 9$	1 1 1 1	 4

No	Peraturan Pemarkahan	Markah	
8	(a) $k = -\frac{1}{11}, m = -3$ (b) $\begin{pmatrix} 5 & 3 \\ 2 & -1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 4 \\ -5 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{-11} \begin{pmatrix} -1 & -3 \\ -2 & 5 \end{pmatrix} \begin{pmatrix} 4 \\ -5 \end{pmatrix}$ $x = -1, y = 3$ <i>Note</i> : $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$ as answer, deduct 1 mark.	1, 1	
		1	
		1	
		1, 1	6
9	(a) $\frac{45}{360} \times 2 \times \frac{22}{7} \times 14$ or $\frac{135}{360} \times 2 \times \frac{22}{7} \times 7$ $14 + \frac{45}{360} \times 2 \times \frac{22}{7} \times 14 + \frac{135}{360} \times 2 \times \frac{22}{7} \times 7 + 7 + 7$ $\frac{111}{2}$ or $55\frac{1}{2}$ or 55.5 (b) $\frac{45}{360} \times \frac{22}{7} \times 14^2$ or $\frac{135}{360} \times \frac{22}{7} \times 7^2$ or $\frac{45}{360} \times \frac{22}{7} \times 7^2$ $\frac{45}{360} \times \frac{22}{7} \times 14^2 - \frac{45}{360} \times \frac{22}{7} \times 7^2 + \frac{135}{360} \times \frac{22}{7} \times 7^2$ $\frac{231}{2}$ or $115\frac{1}{2}$ or 115.5	1	
		1	
		1	
		1	
		1	6
10	(a) (i) {OL, OR, OW, LR, LW, RW} (ii) {OL, OR, OW} $\frac{3}{6} = \frac{1}{2}$ (b) (i) {HM, HZ, HL, HR, HW, YM, YZ, YL, YR, YW, OM, OZ, OL, OR, OW} (ii) {HM, HZ, YM, YZ} $\frac{4}{15}$	1	
		1	
		1	
		1	
			6
11	(a) 11 s (b) $\frac{880 - 0}{11 - 0} = 80$	1	
		1, 1	
		2	

No	Peraturan Pemarkahan	Markah																						
	<p>(3) Rotation , centre (8, 3), award 2 marks</p> <p>(b) V : Enlargement, scale factor = 3 , centre (3, 3)</p> <p><i>Note</i> : (1) Enlargement with scale factor = 3 only @ Enlargement at centre (3, 3), award 2 marks (2). Enlargement only award 1 mark</p> <p>OR</p> <p>(i) (a) U : Rotation, 90° anticlockwise, about centre <i>J</i> .</p> <p><i>Note</i> : (1) Rotation only award 1 mark (2) Rotation 90° anticlockwise clockwise, award 2 marks (3) Rotation , centre <i>J</i>, award 2 marks</p> <p>(b) V : Enlargement with scale factor = 3 , centre (6, 6)</p> <p><i>Note</i> : (1) Enlargement with scale factor = 3 only @ Enlargement at centre (6, 6) award 2 marks (2). Enlargement only award 1 mark</p> <p>OR</p> <p>(i) (a) U : Rotation, 90° anticlockwise, about centre <i>L</i> .</p> <p><i>Note</i> : (1) Rotation only award 1 mark (2) Rotation 90° anticlockwise, award 2 marks (3) Rotation , centre <i>L</i>, award 2 marks</p> <p>(b) V : Enlargement with scale factor = 3 , centre (6, 0)</p> <p><i>Note</i> : (1) Enlargement with scale factor = 3 only @ Enlargement at centre (6, 0) award 2 marks (2). Enlargement only award 1 mark</p> <p>(ii) $3^2 (60)$ $3^2 (60) - 60$ 480</p>	1 1 1	12																					
14	<p>(a)</p> <table border="1" data-bbox="432 1713 997 2007" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Age (years)</th> <th>Frequency</th> <th>Midpoint</th> </tr> </thead> <tbody> <tr> <td>10 – 14</td> <td>4</td> <td>12</td> </tr> <tr> <td>15 – 19</td> <td>6</td> <td>17</td> </tr> <tr> <td>20 – 24</td> <td>10</td> <td>22</td> </tr> <tr> <td>25 – 29</td> <td>8</td> <td>27</td> </tr> <tr> <td>30 – 34</td> <td>7</td> <td>32</td> </tr> <tr> <td>35 – 39</td> <td>5</td> <td>37</td> </tr> </tbody> </table>	Age (years)	Frequency	Midpoint	10 – 14	4	12	15 – 19	6	17	20 – 24	10	22	25 – 29	8	27	30 – 34	7	32	35 – 39	5	37	1, 2, 1	
Age (years)	Frequency	Midpoint																						
10 – 14	4	12																						
15 – 19	6	17																						
20 – 24	10	22																						
25 – 29	8	27																						
30 – 34	7	32																						
35 – 39	5	37																						

No	Peraturan Pemarkahan	Markah	
	<p>(b) $\frac{12(4)+17(6)+22(10)+27(8)+32(7)+37(5)}{40}$ 24.88</p> <p>(c) <i>Refer to graph</i> Uniform scale and correct axes (from 0 to 10 for y-axis and from 7 to 42(4.5 – 44.5) for x-axis and using midpoint / upper boundaries), All six points correctly plotted (row 2 – 6) Smooth and continuous graph and passes point (7, 0) & (42,0)</p> <p>(d) 12 (must based on the polygon frequency drawn)</p>	2	
		1	
		1	
		2	
		1	
		1	
		1	12

