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

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

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

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

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

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

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

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

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

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

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

12 Pythagoras Theorem
$c^2 = a^2 + b^2$

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

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

SHAPES AND SPACE

1 Area of trapezium $= \frac{1}{2} \times$ sum of parallel sides $\times$ height

2 Circumference of circle $= \pi d = 2\pi r$

3 Area of circle $= \pi r^2$

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 $= \frac{1}{3} \times$ base area $\times$ 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 $= k^2 \times$ area of object

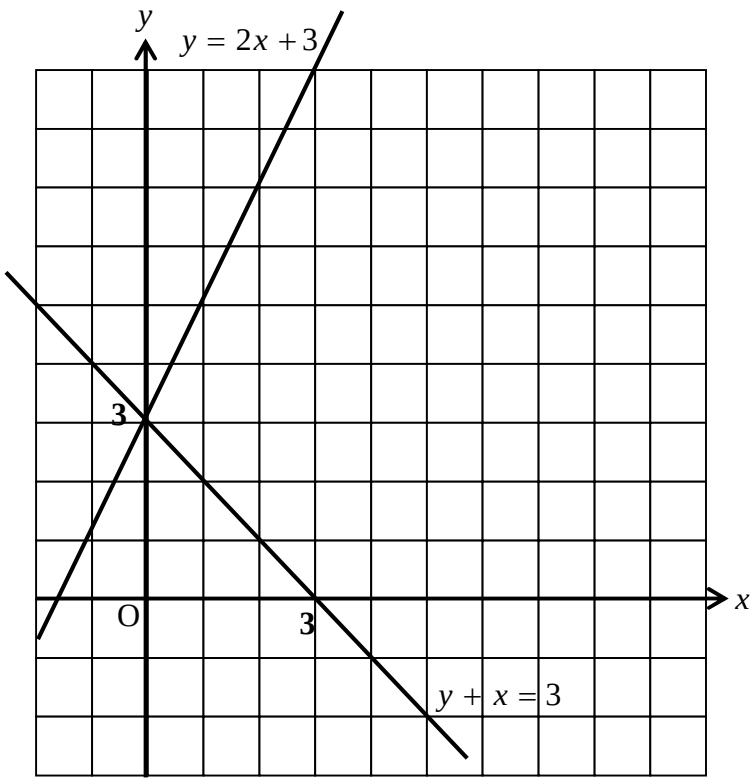
[Lihat halaman sebelah

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 :



[Lihat halaman sebelah

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 :

$$\frac{1}{2}p + 3q = 5$$
$$p - 4q = -20$$

[4 *marks*]

Answer:

3 Solve the following quadratic equation:
Selesaikan persamaan kuadratik 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.*

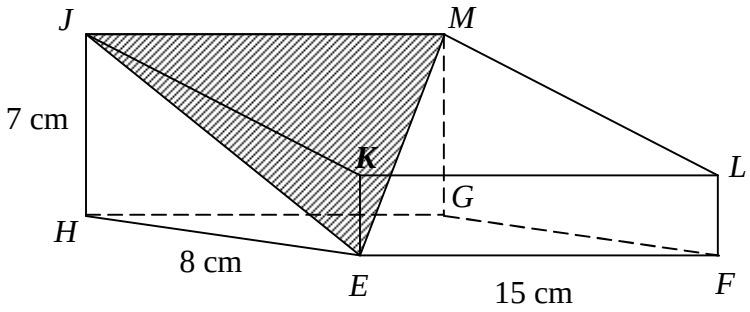


Diagram 4
Rajah 4

(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) ……

……

[Lihat halaman sebelah

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* $x + 3y = 12$.

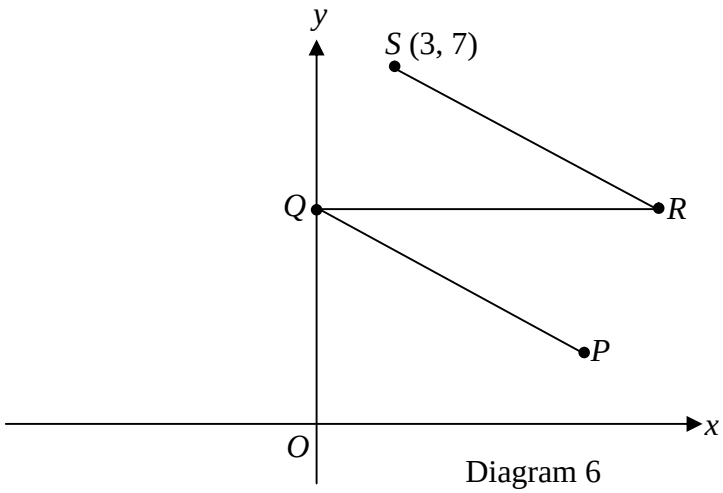


Diagram 6
Rajah 6

(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)

[Lihat halaman sebelah

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 berjejari* 6 cm *dikeluarkan daripada kon itu.*

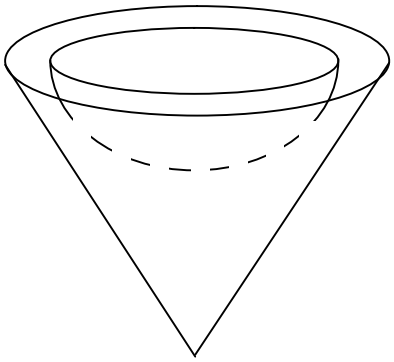


Diagram 7
Rajah 7

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

Diberi bahawa isipadu pepejal yang tinggal ialah $150\frac{6}{7}$ *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.*

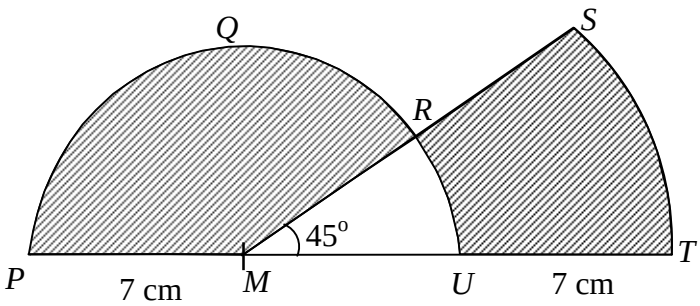


Diagram 9
Rajah 9

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 *Lelaki*	Female *Wanita*
Technical School *Sekolah Teknik*	Hassan Yoges	Meena Zaharah
Boarding School *Sekolah Berasrama*	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)

[Lihat halaman sebelah

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.*

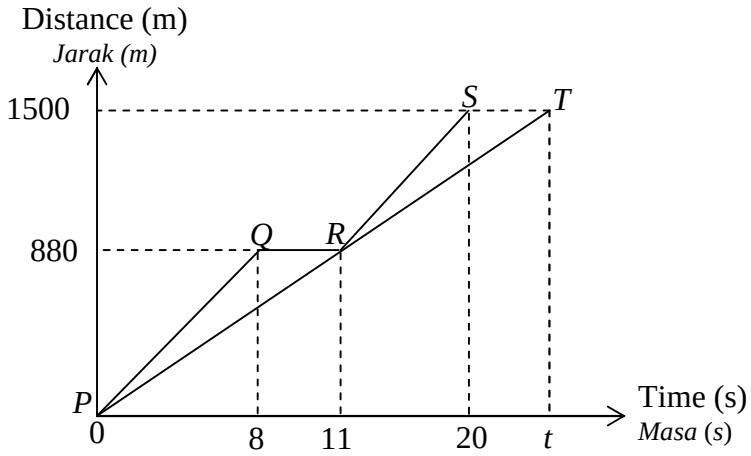


Diagram 11
Rajah 11

(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 ceraian 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 $-4 \le x \le 4$. [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* $-4 \le x \le 4$.

(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 $-4 \le x \le 4$.
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* $-4 \le x \le 4$.
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 Cartesan.*

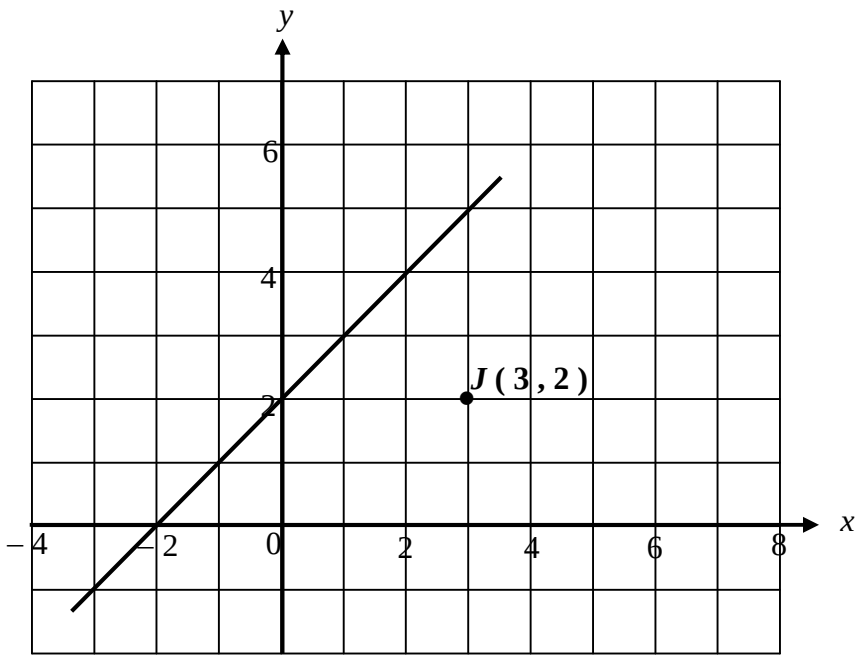


Diagram 13.1

(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)

[Lihat halaman sebelah

(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 Cartesan.*

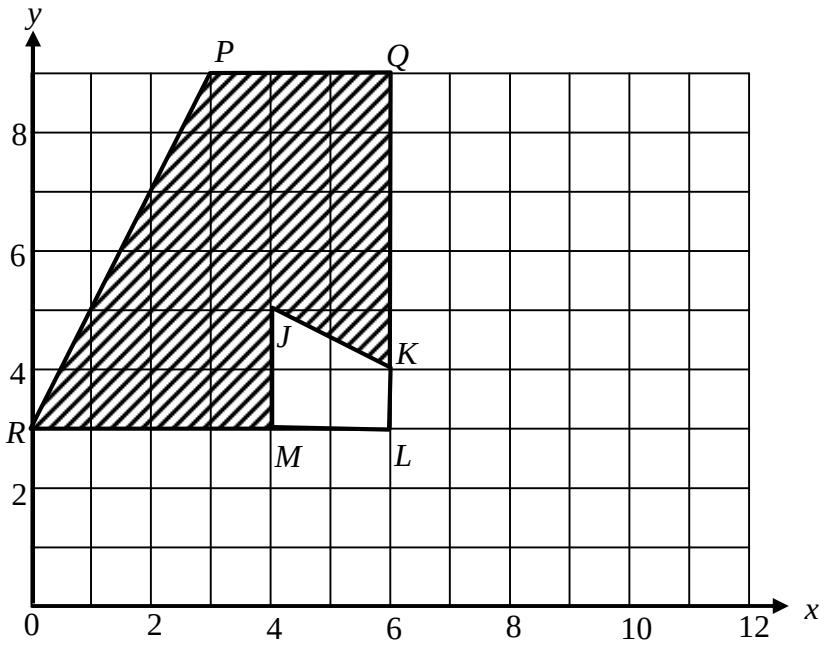


Diagram 13.2
Rajah 13.2

(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		
	.	

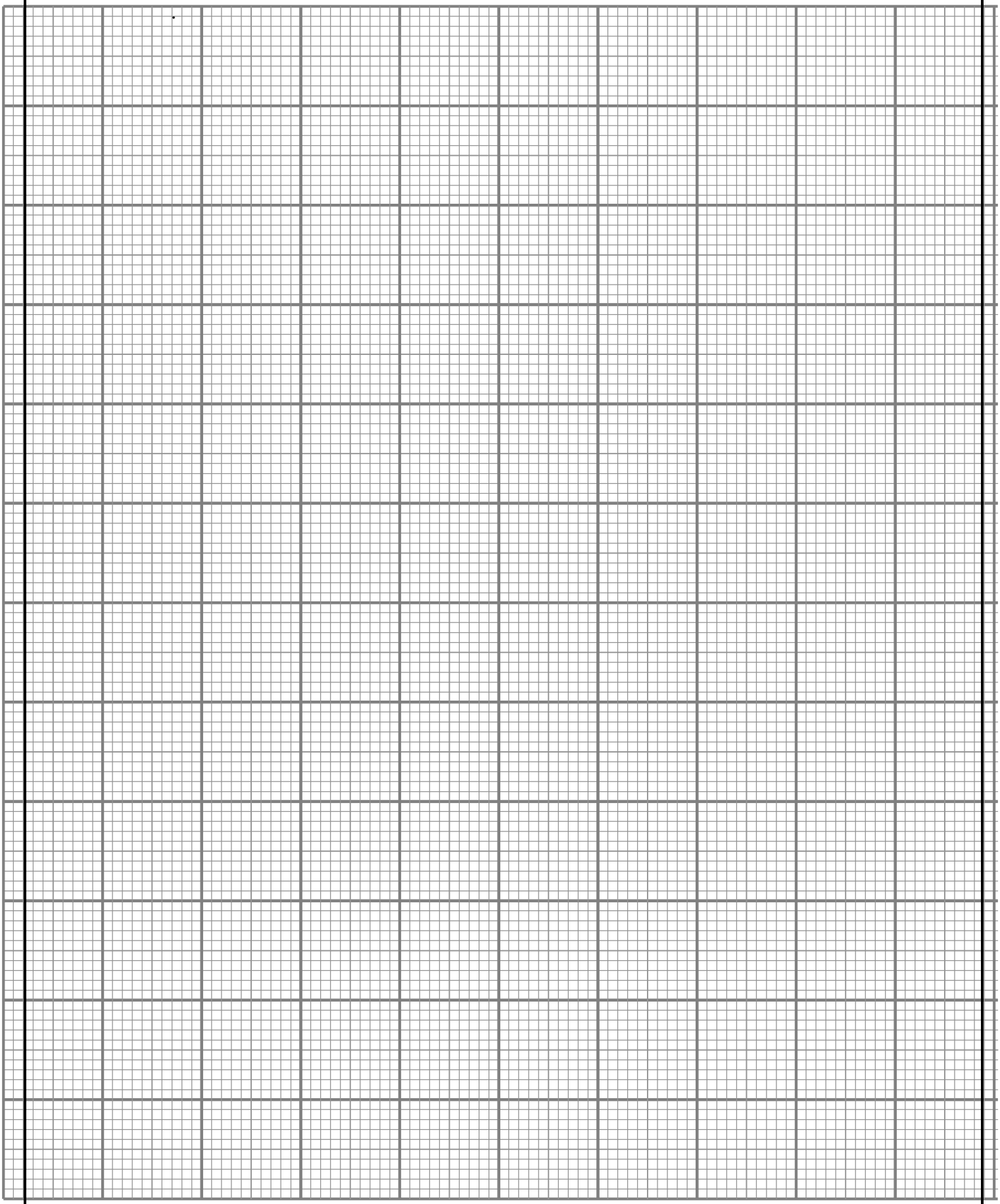
Table 14
Jadual 14

(b)

(d) .....

[Lihat halaman sebelah

Graph for Question 14



[Lihat halaman sebelah

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.

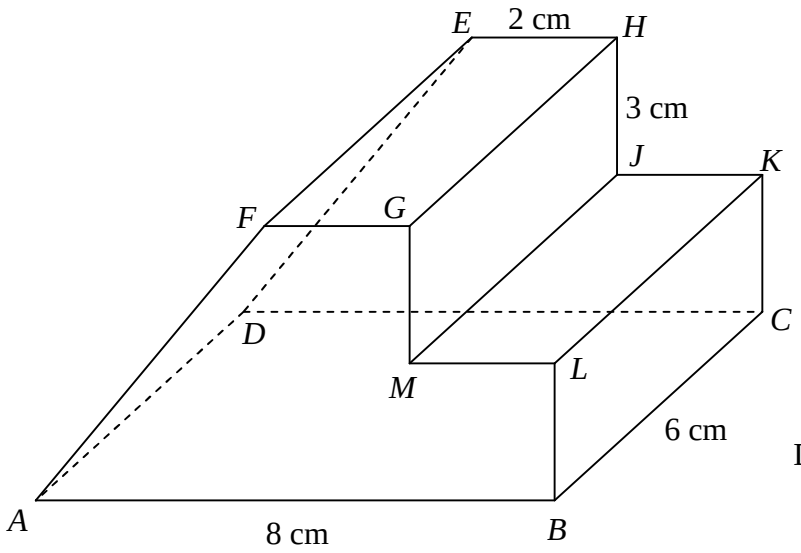


Diagram 15(i)
Rajah 15(*i*)

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.

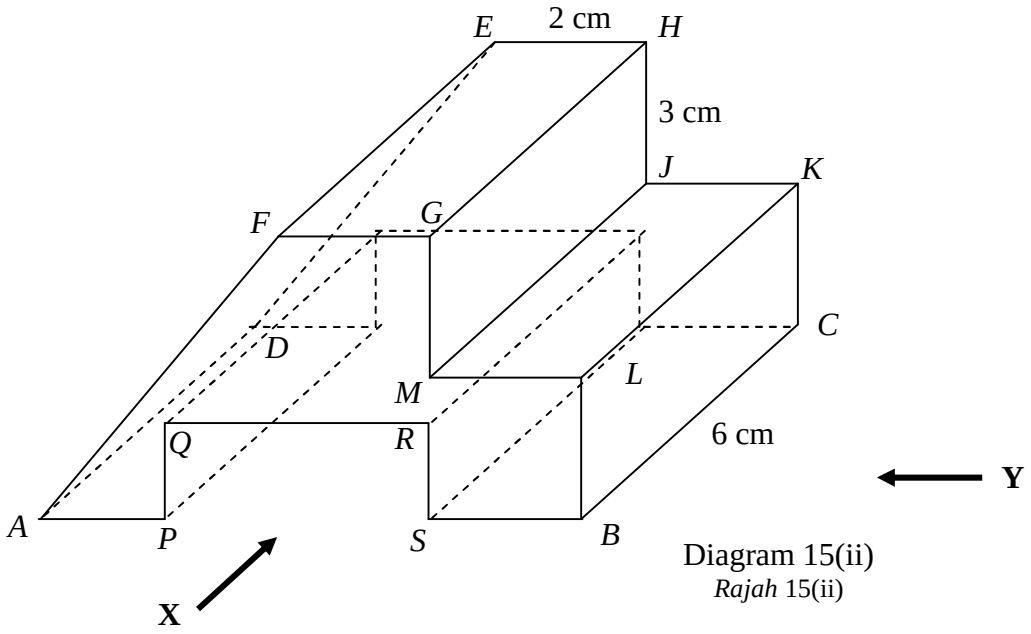


Diagram 15(ii)
Rajah 15(ii)

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 $D(30^oN, 50^o W)$, $F(30^oN, 25^o W)$, G and H are four points on the surface of the earth. DG is a diameter of the earth.
$D(30^oU, 50^o B)$, $F(30^oU, 25^o B)$, 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%) :

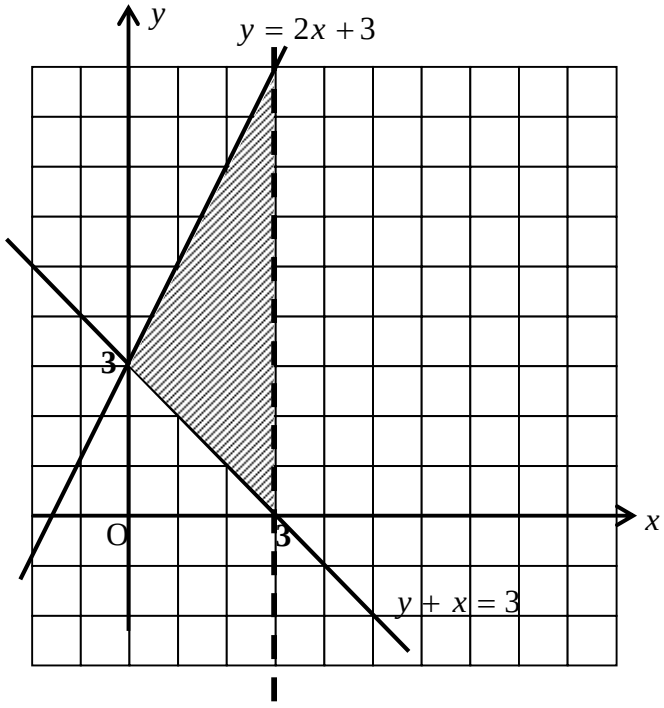
KERTAS 1(40%) + KERTAS 2 (100%)

Keseluruhan Markah = $(\frac{\text{ker tas1} + \text{ker tas 2}}{140}) \times 100$

Peraturan ini adalah untuk panduan guru sahaja.

Terima Kasih

MARKAH MAKSIMUM BAGI KERTAS INI : 100 MARKAH

No	Peraturan Pemarkahan	Markah	
1	 Dashed line for $x = 3$ Region correctly shaded	1 2	**3**
2	$p = -20 + 4q$ or $p + 6 = 10$ $5q = 15$ or $10q = 30$ $q = 3$ $p = -8$	1 1 1 1	**4**
3	$4n^2 + 7n - 2 = 0$ $(4n - 1)(n + 2) = 0$	1 1	

[Lihat halaman sebelah

No	Peraturan Pemarkahan	Markah	
	$n=\frac{1}{4}, \quad n=-2$	1,1	**4**
4	$\angle HJE$ or $\angle EJH$ $\tan \angle HJE = \frac{8}{7}$ $\angle HJE = 48.81^{o}$ or $48^{o}\ 48'$	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) $m = -\frac{1}{3}$ $7 = -\frac{1}{3}(3) + c$ $y = -\frac{1}{3}x + 8$ $y_{int} = 8$	1 1 1 1 1	**5**
7	$V_{cone} = \frac{1}{3}\times\frac{22}{7} \times 8\times 8\times h$ $V_{hemisphere} = \frac{1}{2}\times\frac{4}{3}\times\frac{22}{7}\times 6^3$ $\frac{1}{3}\times\frac{22}{7} \times 8\times 8\times h - \frac{1}{2}\times\frac{4}{3}\times\frac{22}{7}\times 6^3 = 150\frac{6}{7}$ $h = 9$	1 1 1 1	**4**

[Lihat halaman sebelah

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

[Lihat halaman sebelah

No	Peraturan Pemarkahan	Markah	
	(c) $\frac{1500}{20} = 3\left(\frac{1500}{t}\right)$ $t = 60$	1	**6**
12	(a) x : –4, 1.5 y : 4.5, –12	1, 1	
	(b) *Refer to graph* Uniform scale and axes in correct directions Plot all points correctly Smooth curve *Note* : 1 or 2 points wrongly plotted, award 1 mark, and 0 mark for graph.	1 2 1	
	(c) (i) $-8 \le y \le -7$ (ii) $-1.65 \le x \le -1.55$	1 1	
	(d) Line $y = -4x + 8$ Draw line $y = -4x + 8$ $-1.35 \le x \le -1.25$, $3.25 \le x \le 3.35$	1 1 1, 1	**12**
13	(a) (i) (5, –1) (ii) (2 , 2) *Note* : (0, 5) seen or marked , (2, 2) seen or marked award 1 mark	1 2	
	(b) (i) (a) **U** : Rotation, 90° anticlockwise, about centre (5, 4) *Note* : (1) Rotation only award 1 mark (2) Rotation 90° anticlockwise, award 2 marks (3) Rotation , centre (8, 3), award 2 marks	3	
	(b) **V** : Enlargement with scale factor = 3 , centre *L* *Note* : (1) Enlargement with scale factor = 3 only @ Enlargement at centre (5, 4) , award 2 marks (2). Enlargement only award 1 mark	3	
	OR (i) (a) **U** : Rotation, 90° anticlockwise, about centre *M* . *Note* : (1) Rotation only award 1 mark (2) Rotation 90° anticlockwise, award 2 marks		

<table>
<tr><th>No</th><th>Peraturan Pemarkahan</th><th colspan="2">Markah</th></tr>
<tr><td></td><td>(3) Rotation , centre (8, 3), award 2 marks

(b) V : Enlargement, scale factor = 3 , centre (3, 3)

Note : (1) Enlargement with scale factor = 3 only @ Enlargement at centre (3, 3), award 2 marks
(2). Enlargement only award 1 mark

OR
(i) (a) U : Rotation, 90^o anticlockwise, about centre J .

Note : (1) Rotation only award 1 mark
(2) Rotation 90^o anticlockwise clockwise, award 2 marks
(3) Rotation , centre J, award 2 marks

(b) V : Enlargement with scale factor = 3 , centre (6, 6)
Note : (1) Enlargement with scale factor = 3 only @ Enlargement at centre (6, 6) award 2 marks
(2). Enlargement only award 1 mark

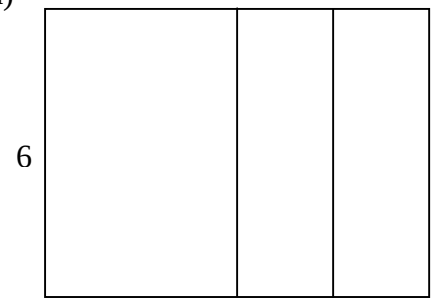
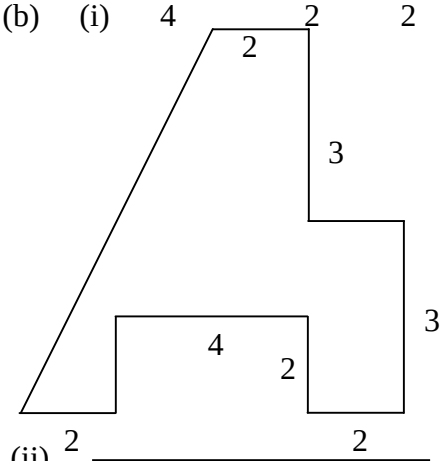
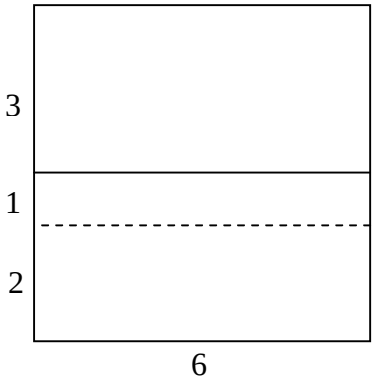
OR
(i) (a) U : Rotation, 90^o anticlockwise, about centre L.

Note : (1) Rotation only award 1 mark
(2) Rotation 90^o anticlockwise, award 2 marks
(3) Rotation , centre L, award 2 marks

(b) V : Enlargement with scale factor = 3 , centre (6, 0)
Note : (1) Enlargement with scale factor = 3 only @ Enlargement at centre (6, 0) award 2 marks
(2). Enlargement only award 1 mark

(ii) $3^2(60)$
$3^2(60) - 60$
480</td><td>1
1
1</td><td>12</td></tr>
<tr><td>14</td><td>(a)
<table>
<tr><th>Age (years)</th><th>Frequency</th><th>Midpoint</th></tr>
<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>
</table></td><td>1, 2, 1</td><td></td></tr>
</table>

[Lihat halaman sebelah

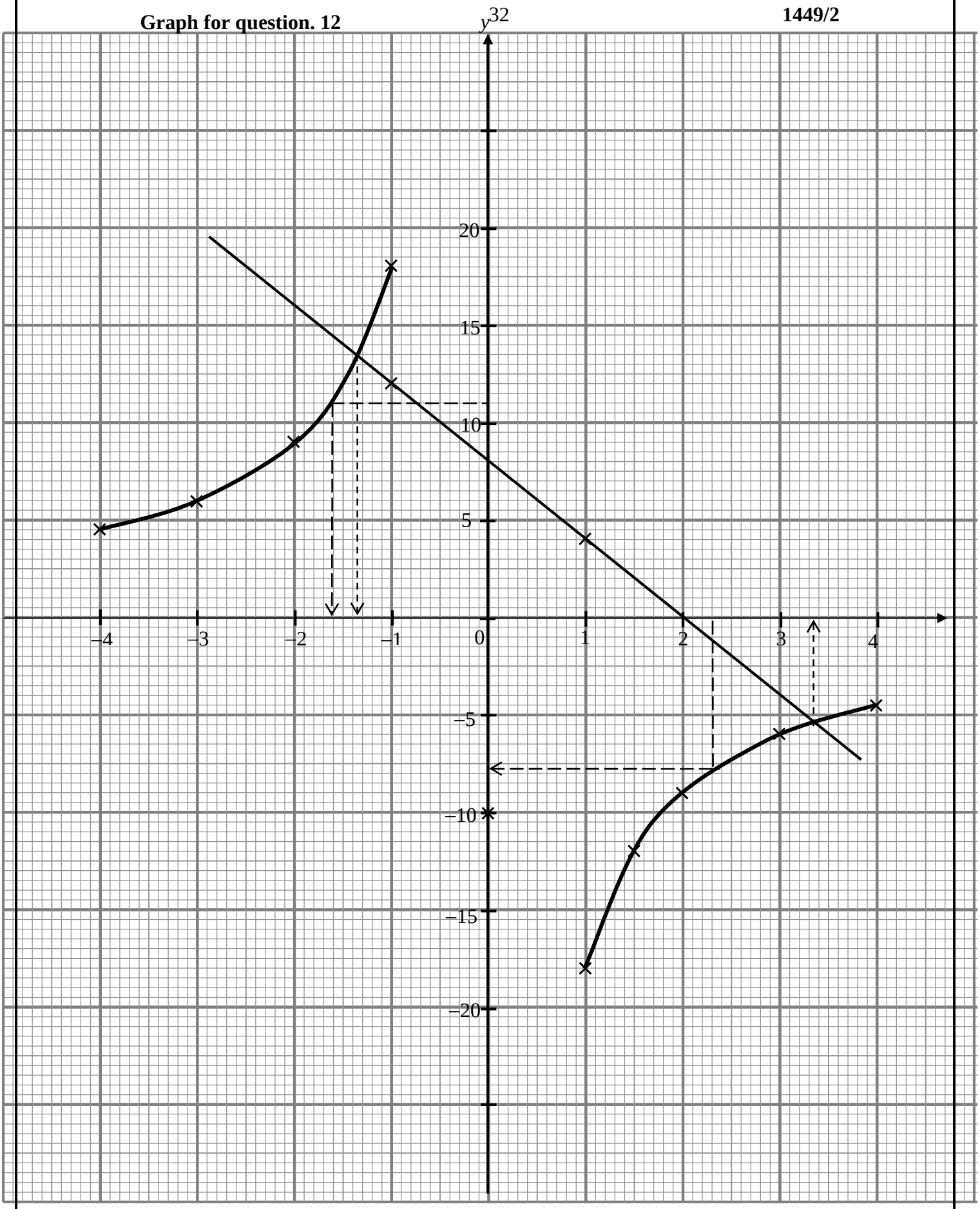
No	Peraturan Pemarkahan	Markah	
	(b) $\frac{12(4)+17(6)+22(10)+27(8)+32(7)+37(5)}{40}$	2	
	24.88	1	
	(c) *Refer to graph* Uniform scale and correct axes (from 0 to 10 for *y*- axis and from 7 to 42(4.5 – 44.5) for *x*-axis and using midpoint / upper boundaries), All six points correctly plotted (row 2 – 6) Smooth and continuous graph and passes point (7, 0) & (42,0)	1 2 1	
	(d) 12 (must based on the polygon frequency drawn)	1	**12**
15	(a)  Correct shape Correct dimensions Accuracy (± 2 mm, ± 1°)	 1 1 1	
	(b) (i)  Correct shape Correct measurements Accuracy (± 2 mm, ± 1°)	 1 1 2	
	(ii)  Correct shape Correct dashed line Correct dimensions Accuracy (± 2 mm, ± 1°) *Note* : Dashed line not drawn, 0 mark for measurements and accuracy.	 1 1 1 2	**12**
16	(a) (30° *S*, 130° *E*) *Note* : 30° *S* or 130° *E*, award 1 mark	2	
	(b) 60 × 60	1	

[Lihat halaman sebelah

No	Peraturan Pemarkahan	Markah	
	3600	1	
	(c) $\frac{5400}{60}$ or 90	1	
	$90 - 30$	1	
	60^o *S*	1, 1	
	(d) $25(60)\cos 30^o$	1	
	$\frac{5400 + (25)(60)\cos 30^o}{450}$	2	
	14.89 hrs	1	**12**
	Note : Do not accept answer in hours and mins.		

[Lihat halaman sebelah

Graph for question. 12



[Lihat halaman sebelah