

**SULIT**  
**1449/2**  
**Matematik**  
**Kertas 2**  
**September 2012**  
 $2\frac{1}{2}$  jam

**1449/2**

NAMA :

TINGKATAN :



**SMK TAMAN BUKIT INDAH**  
**JOHOR BAHRU**

**PEPERIKSAAN PERCUBAAN SPM**  
**TAHUN 2012**

**MATEMATIK**

**Kertas 2**

**Dua jam tiga puluh minit**

**JANGAN BUKA KERTAS SOALAN INI**  
**SEHINGGA DIBERITAHU**

1. Jawapan hendaklah ditulis dengan jelas dalam ruang yang disediakan dalam kertas soalan.
2. Tunjukkan langkah-langkah penting. Ini boleh membantu anda untuk mendapatkan markah.
3. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
4. Satu senarai rumus disediakan di halaman 2 & 3
5. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

Disediakan oleh

.....  
Pn Hjh Nora Abdul Jalil

Disahkan oleh

.....  
Cik Loi Lai Fong  
Ketua Panitia Matematik

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

Kertas soalan ini mengandungi 19 halaman bercetak dan 1 halaman tidak bercetak

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[Lihat sebelah  
**SULIT**

### MATHEMATICAL FORMULAE

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

#### RELATIONS

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

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

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

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

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

$$6 \quad P(A^c) = 1 - P(A)$$

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

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

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

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

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

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

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

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

**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 =  $\pi r^2$
- 4 Curved surface area of cylinder =  $2\pi rh$
- 5 Surface area of sphere =  $4\pi r^2$
- 6 Volume of right prism =  $\text{cross sectional area} \times \text{length}$
- 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 =  $k^2 \times \text{area of object}$

**Section A**  
[52 marks/ Markah]

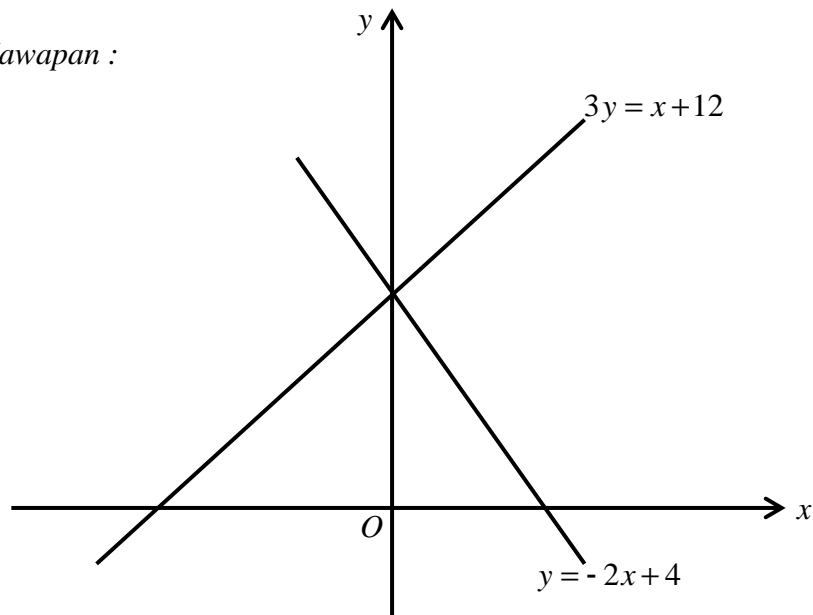
Answer **all** questions in this section.  
Jawab **semua** soalan di bahagian ini.

- 1 On the graph in the answer space, shade the region which satisfies the three inequalities  $3y \leq x+12$ ,  $y \geq -2x+4$  and  $x < 2$ .

Di ruang jawapan, lorekkan rantau yang memuaskan ketiga-tiga ketaksamaan  $3y \leq x+12$ ,  $y \geq -2x+4$  and  $x < 2$ .

[3 marks/ markah]

Answer/ Jawapan :



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

Hitung nilai  $v$  dan  $w$  yang memuaskan persamaan linear serentak:

$$2v - 3w = 13$$

$$4v + w = 5$$

[4 marks/ markah]

Answer/ Jawapan :

3 Solve the quadratic equation  $\frac{3x(x - 3)}{2} + x = 2(1 + x)$

Selesaikan persamaan kuadrat  $\frac{3x(x - 3)}{2} + x = 2(1 + x)$

[4 marks/ markah]

Answer/ Jawapan :

4 Diagram 4 shows a cuboid with *TUVW* as the horizontal base . *L*, *M* and *N* are the midpoints of *PS*, *QR* and *UV* respectively.  
Rajah 4 menunjukkan sebuah kuboid dengan tapak mengufuk *TUVW*. *L*, *M* dan *N* adalah titik tengah bagi *PS*, *QR* dan *UV* masing-masing.

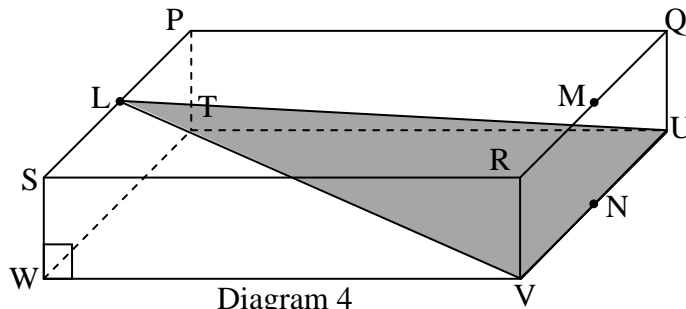


Diagram 4  
Rajah 4

Given *WT* = 8 cm, *WV* = 12 cm and *QU* = 4 cm.

- (a) Identify the angle between the plane *LVU* and the plane *QRVU*.
- (b) Calculate the angle between the plane *LVU* and the plane *QRVU*.

Diberi *WT* = 8 cm, *WV* = 12 cm dan *QU* = 4 cm.

- (a) Kenal pasti sudut di antara satah *LVU* dengan satah *QRVU*.
- (b) Hitungkan sudut di antara satah *LVU* dengan satah *QRVU*.

[3 marks/ markah]

Answer/ Jawapan :

- (a)
- (b)

- 5** (a) State whether the following statement is true or false.  
*Tentukan sama ada pernyataan berikut benar atau palsu.*  
“ $3^3 = 9$  or  $\sqrt[3]{8} = 2$ ”
- (b) Write down two implications based on the sentence below.  
*Tuliskan dua impikasi berdasarkan ayat di bawah.*

$$2x = 10 \text{ if and only if } x = 5$$

$$2x = 10 \text{ jika dan hanya jika } x = 5$$

- (c) Given the number sequence 3, 8, 15, 24, ..... and  
*Diberi urutan nombor 3, 8, 15, 24, .....dan*

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

$$8 = 2^2 + 2(2)$$

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

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

.....

Make a general conclusion by using the induction method for the numerical sequence above.

*Buat satu kesimpulan umum secara aruhan bagi urutan nombor di atas.*

[5 marks/ markah]

*Answer/ Jawapan :*

(a)

(b)

(c)

- 6** In Diagram 6,  $PQ$  and  $RS$  are parallel to the  $x$ -axis and  $PS$  is parallel to  $RT$ .  
*Dalam rajah 6,  $PQ$  dan  $RS$  adalah selari dengan paksi- $x$  dan  $PS$  adalah selari dengan  $RT$ .*

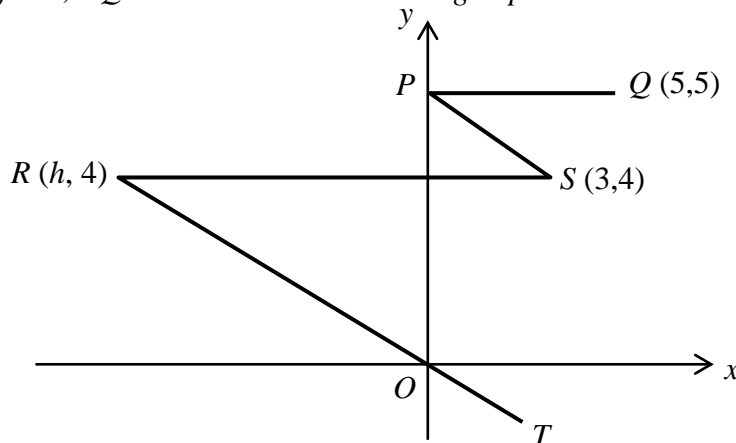


Diagram 6  
Rajah 6

Find

Cari

- (a) the coordinates of  $P$ ,  
*koordinat bagi  $P$ ,*
- (b) the value of  $h$ , hence, find the equation of line  $RT$ .  
*nilai  $h$  dan seterusnya persamaan garis lurus  $RT$ .*

[5 marks/ markah]

Answer/ Jawapan :

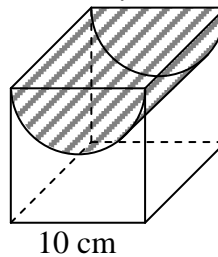
(a)

(b)

- 7 Diagram 7 shows a solid cube. A part of the cube in the shape of a half-cylinder is removed from its upper surface.

*Rajah 7 menunjukkan sebuah kiub. Sebahagian dari kiub itu yang berbentuk separuh silinder dikeluarkan daripada permukaan atasnya.*

Diagram 7  
Rajah 7



Calculate the total volume, in  $\text{cm}^3$ , of the remaining solid. [Use  $\pi = 3.142$ ]

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

[4 marks/ markah]

Answer/ Jawapan :

Untuk  
Kegunaan  
Pemeriksa

- 8 (a) Given that the inverse matrix for  $H = \begin{pmatrix} 5 & -8 \\ 1 & -2 \end{pmatrix}$  is  $\begin{pmatrix} m & -4 \\ 1 & n \end{pmatrix}$

Matriks songsang bagi  $H = \begin{pmatrix} 5 & -8 \\ 1 & -2 \end{pmatrix}$  adalah  $\begin{pmatrix} m & -4 \\ 1 & n \end{pmatrix}$ .

Find the value of  $m$  and of  $n$ .

Cari nilai  $m$  dan nilai  $n$ .

- (b) Using matrices, calculate the value of  $x$  and of  $y$  that satisfy the following simultaneous linear equations:  
Menggunakan kaedah matrik, hitung nilai  $x$  dan nilai  $y$  yang memuaskan persamaan linear serentak berikut:

$$5x - 8y = 9$$

$$x - 2y = 3$$

[7 marks]

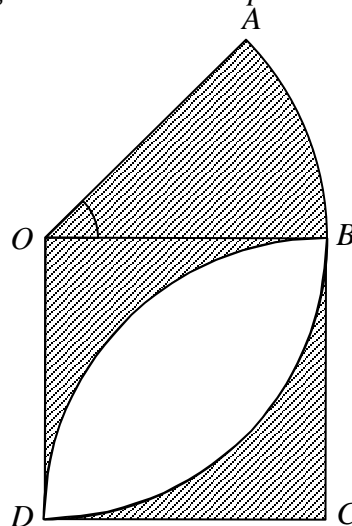
Answer/ Jawapan :

(a)

(b)

- 9 In Diagram 9,  $ABD$  is an arc of a sector with the centre  $O$  and  $BCD$  is a quadrant.  
Dalam rajah 9,  $ABD$  ialah lengkok satu sektor berpusat  $O$  dan  $BCD$  ialah sukuan bulatan.

DIAGRAM 9  
Rajah 9





Given that  $OD = OB = 14$  cm and  $\sphericalangle AOB = 45^\circ$ . Using  $\rho = \frac{22}{7}$ , calculate

Diberi bahawa  $OD = OB = 14$  cm dan  $\sphericalangle AOB = 45^\circ$ . Dengan menggunakan  $\rho = \frac{22}{7}$ . Hitung,

- (a) the perimeter, in cm, of the whole diagram,  
*perimeter, dalam cm, seluruh rajah,*
- (b) the area, in  $\text{cm}^2$ , of the shaded region.  
*luas, dalam  $\text{cm}^2$ , kawasan yang berlorek.*

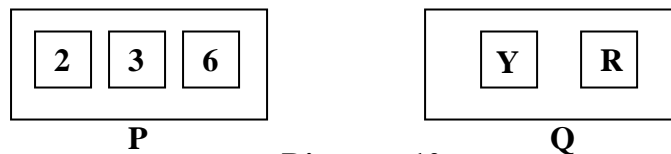
[6 marks/ markah]

Answer/ Jawapan :

(a)

(b)

- 10** Diagram 10 shows three numbered cards in box P and two cards labeled with letters in box Q.  
*Rajah 10 menunjukkan tiga kad nombor di dalam kotak P dan dua kad huruf di dalam kotak Q*



**Diagram 10**  
**Rajah 10**

A card is picked at random from box P and then a card is picked at random from box Q.  
*Satu kad dipilih secara rawak daripada kotak P dan kemudian satu kad pula dipilih secara rawak daripada kotak Q.*

By listing the sample of all the possible outcomes of the event, find the probability that  
*Dengan menyenaraikan sampel bagi semua kesudahan yang mungkin, cari kebarangkalian*

- (a) a card with an even number and the card labeled Y are picked,  
*satu kad nombor genap dan kad berlabel Y dipilih,*
- (b) a card with a number multiple of 3 or the card labeled R are picked.  
*satu kad nombor gandaan 3 atau kad berlabel R dipilih.*

[5 marks]

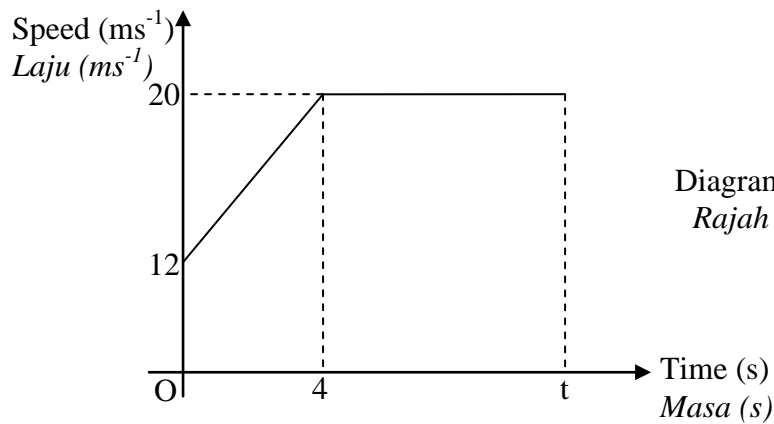
Answer/ Jawapan :

(a)

(b)

11. Diagram 11 shows the speed-time graph for the movement of a particle for a period of  $t$  seconds.

Rajah 11 menunjukkan graf laju- masa bagi pergerakan satu zarah dalam tempoh  $t$  saat.



- (a) State the uniform speed, in  $\text{ms}^{-1}$ , of the particle.  
*Nyatakan laju seragam, dalam  $\text{ms}^{-1}$ , zarah itu.*
- (b) Calculate the rate of change of speed, in  $\text{ms}^{-2}$ , of the particle in the first 4 seconds.  
*Hitung kadar perubahan laju, dalam  $\text{ms}^{-2}$ , zarah itu dalam 4 saat pertama.*
- (c) The total distance travelled in  $t$  seconds is 184 metres. Calculate the value of  $t$ .  
*Jumlah jarak yang dilalui dalam  $t$  saat ialah 184 meter. Hitung nilai  $t$ .*

[6 marks]

Answer/ Jawapan :

(a)

(b)

(c)

**Section B**

[48 marks]

Answer 4 questions in this section.

- 12 (a) Complete Table 12 in the answer space for the equation  $y = x^3 - 10x + 16$  by writing down the values of  $y$  when  $x = -3, 1$  and  $2$ .

*Lengkapkan Jadual 12 di ruang jawapan bagi persamaan  $y = x^3 - 10x + 16$  dengan menulis nilai-nilai  $y$  apabila  $x = -3, 1$  dan  $2$ .*

[3 marks/ markah]

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

By using a scale of 2 cm to represent 1 unit on the  $x$ -axis and a scale of 2 cm to represent 5 units on the  $y$ -axis, draw the graph of  $y = x^3 - 10x + 16$  for  $-3 \leq x \leq 4$ .

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

*Dengan menggunakan skala 2 cm kepada 1 unit pada aksi- $x$  dan 2 cm kepada 5 unit pada paksi- $y$ , lukis graf  $y = x^3 - 10x + 16$  untuk  $-3 \leq x \leq 4$ .*

[4 marks/ markah]

- (c) From your graph in 12(b), find the value of  $y$  when  $x = -0.6$ .

*Dari graf di 12(b), cari nilai  $y$  bila  $x = -0.6$ .*

[1 mark/ markah]

- (d) Draw a suitable straight line on the graph in 12(b) to find the values of  $x$  which satisfy the equation  $x^3 - 15x + 11 = 0$  for  $-3 \leq x \leq 4$ . State these values of  $x$ .

*Lukis satu garis lurus yang sesuai pada graf di 12(b) untuk mencari nilai-nilai  $x$  yang memuaskan persamaan  $x^3 - 15x + 11 = 0$  untuk  $-3 \leq x \leq 4$ .*

[4 marks/ markah]

Answer/ Jawapan :

(a)

$x$	-3	-2	-1	0	1	2	3	4
$y$		28	25	16			13	40

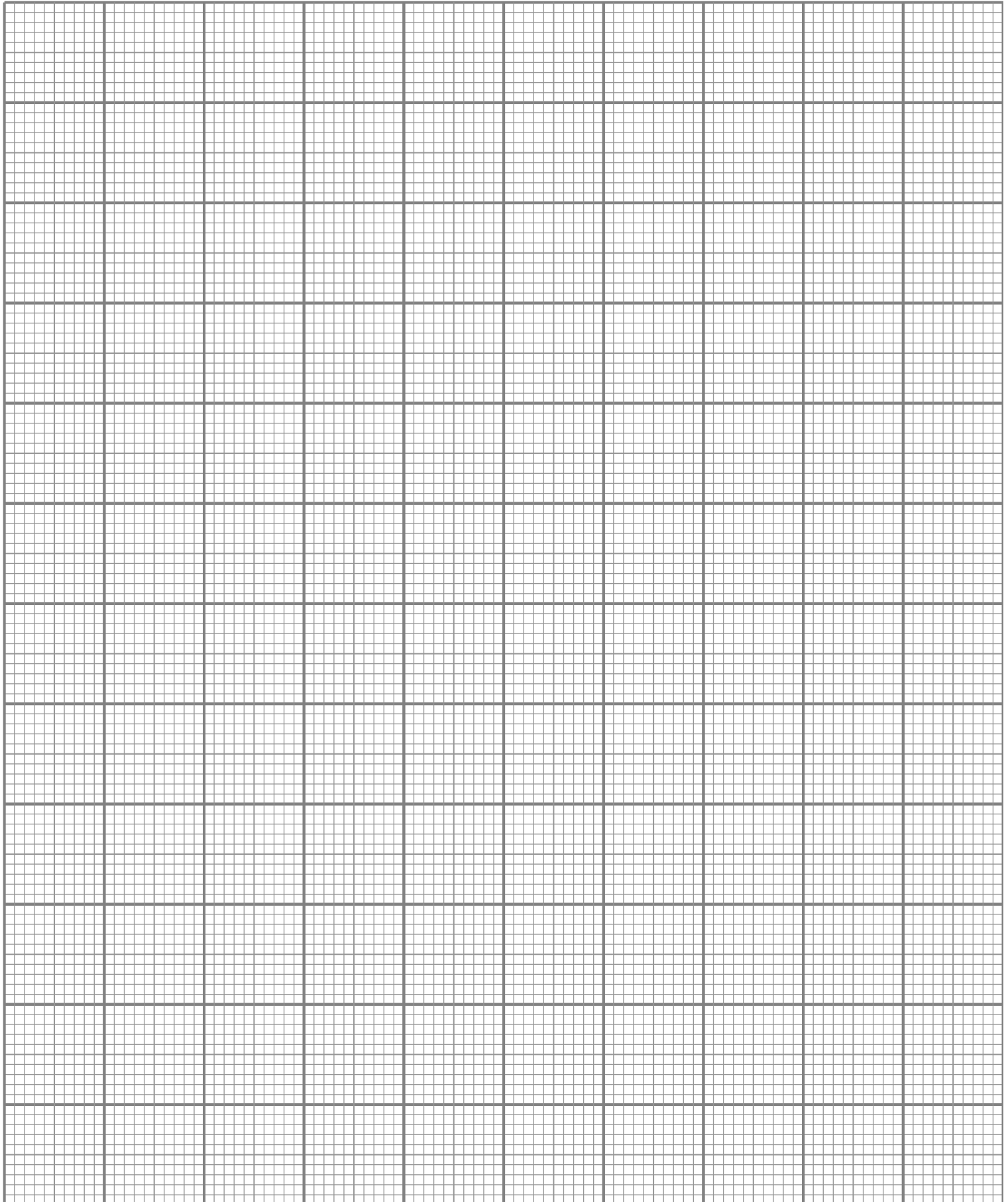
Table 12  
Jadual 12

- (b) Refer graph on page 12.  
*Rujuk graf di halaman 12.*

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

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

Graph for Question 12/ Graf untuk soalan 12



13 (a) Transformation **R** is an anticlockwise rotation of  $90^\circ$  about the center (3, 2) and transformation **T** is a translation  $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ .

Penjelmaan **R** ialah putaran  $90^\circ$  lawan arah jam pada pusat (3, 2) dan penjelmaan **T** ialah translasi  $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ .

State the coordinates of the image of the point (-1, 1) under the following transformations:

Nyatakan koordinat imej bagi titik (-1, 1) di bawah setiap penjelmaan berikut:

- (i) Rotation **R**,  
Putaran **R**,
- (ii) Combined transformation **RT**.  
Gabungan penjelmaan **RT**.

[3 marks/markah]

(b) Diagram 12 shows three quadrilateral *EFGH*, *ABCD* and *OFJK* on a Cartesian plane. Rajah 12 menunjukkan tiga sisi empat *EFGH*, *ABCD* dan *OFJK* pada satah Cartesian.

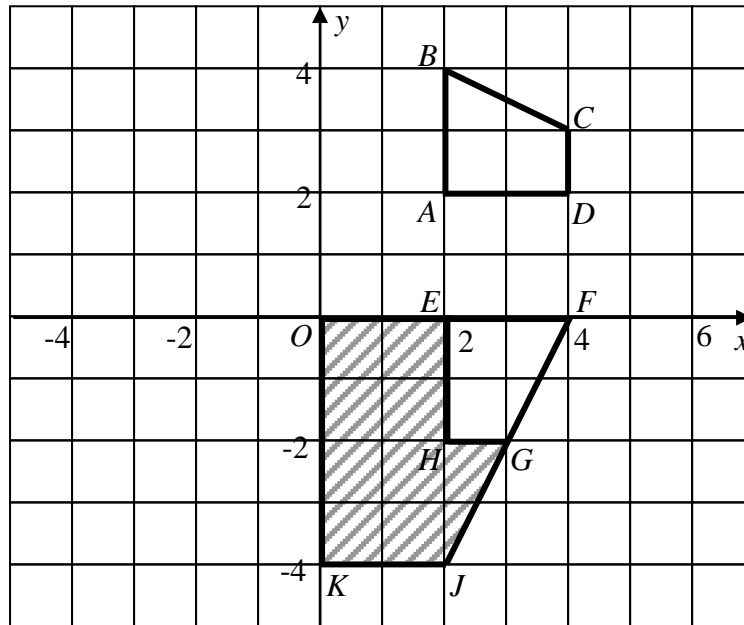


Diagram 12  
Rajah 12

- (i) *EFGH* is the image of *ABCD* under the transformation **U** and *OFJK* is the image of *EFGH* under the transformation **V**. Describe completely the transformation:  
*EFGH* ialah imej bagi *ABCD* di bawah penjelmaan **U** dan *OFJK* ialah imej bagi *EFGH* under the transformation **V**. Huraikan selengkapnya penjelmaan:
  - (a) **U**,
  - (b) **V**.

[6 marks]

- (ii) Given that the shaded area is 120 unit<sup>2</sup>, calculate the area of *ABCD*, in unit<sup>2</sup>.  
Diberi kawasan yang berlorek ialah 120 unit<sup>2</sup>, hitung luas kawasan *ABCD*, dalam unit<sup>2</sup>.

[3 marks]

Untuk  
Kegunaan  
Pemeriksa

Answer/ Jawapan :

(a) (i)

(ii)

(b) (i) (a)

(b)

(ii)

**14 (a)** The data in Diagram 14 shows the body weight, in kg, of 32 children in a kindergarten.  
*Data dalam Rajah 14 menunjukkan timbangan berat , dalam kg, bagi 32 murid dalam sebuah tadika.*

28	11	23	27	20	15	30	24
27	25	17	19	16	23	25	26
29	17	23	12	20	21	23	28
29	19	33	24	23	24	25	31

Diagram 14  
Rajah 14

- a) Based on the data in Diagram 14 and by using the class interval of 3, complete Table 14 in the answer space.  
*Berdasarkan data dalam Rajah 14 dan dengan menggunakan selang kelas 3, lengkapkan Jadual 14 di ruangan jawapan.* [3 marks/ markah]
- b) State the modal class.  
*Nyatakan kelas mod.* [1 mark/ markah]
- c) Based on Table 14 in (a), calculate the mean weight, in kg.  
*Berdasarkan Jadual 14 di (a), hitungkan min berat, dalam kg.* [3 marks/ markah]

- d) By using a scale of 2 cm to 3 kg on the horizontal axis and 2 cm to 1 child on the vertical axis, draw a histogram for the data.  
*Dengan menggunakan skala 2 cm kepada 3 kg pada paksi mengufuk dan 2 cm kepada 1 murid pada paksi mencancang, lukiskan satu histogram bagi data tersebut*  
[4 marks/ markah]
- (e) State one information obtained based on the histogram in 14(d).  
*Nyatakan satu maklumat berdasarkan histogram di 14(d)*  
[1 mark/ markah]

Answer/ Jawapan :

(a)

Class Interval	Midpoint	Frequency
10-12		

TABLE 14

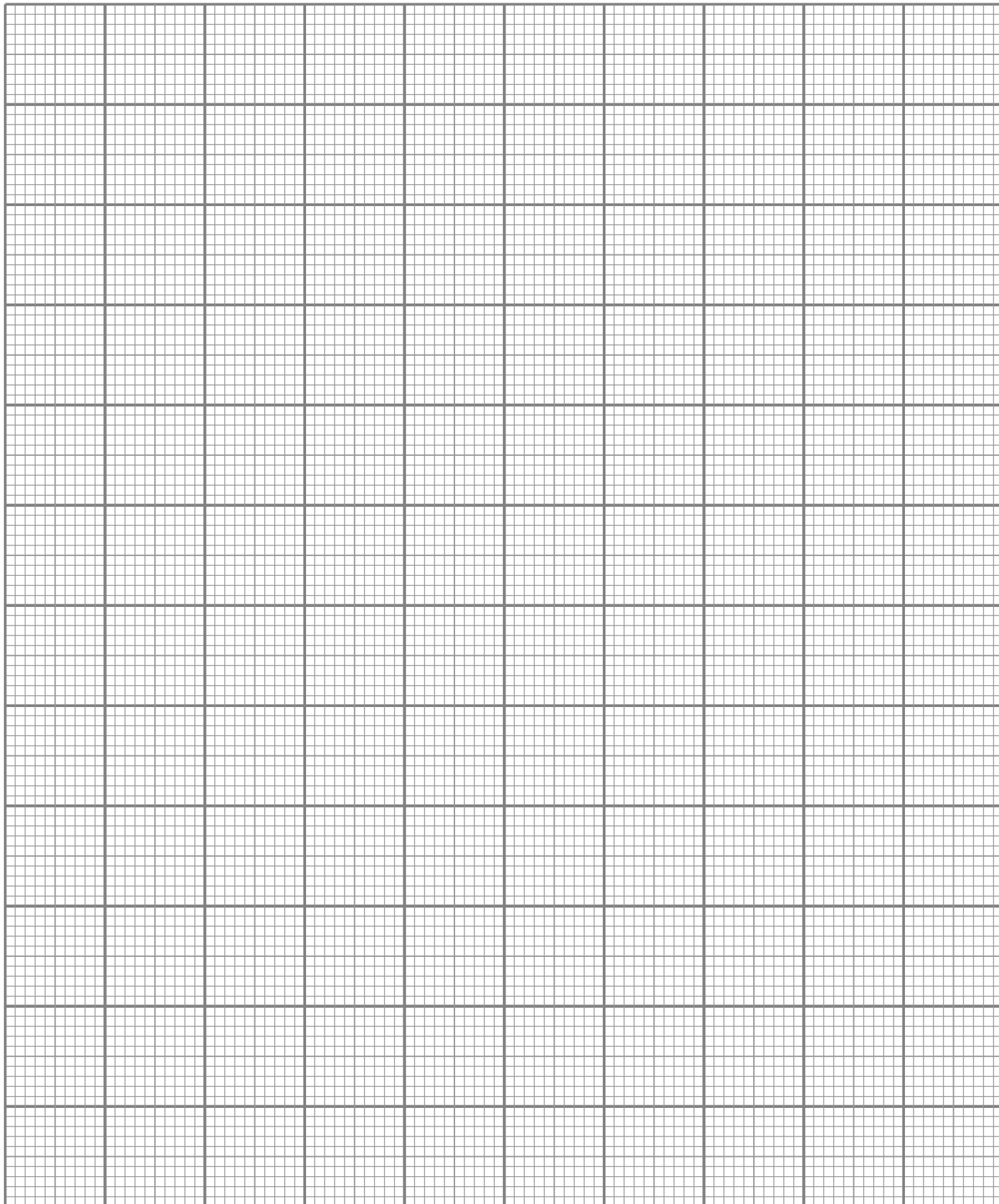
(b)

(c)

- (d) Refer graph on page 16.  
*Rujuk graf di halaman 16.*

(e)

**Graph for Question 14/ Graf untuk soalan 14**





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

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

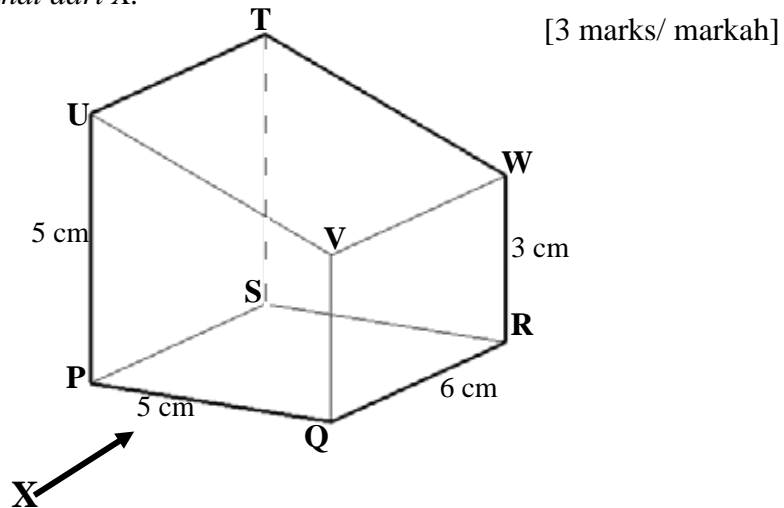
- a) Diagram 15.1 shows a solid right prism with a rectangular base PQRS on a horizontal plane. PQVU is the uniform cross-section of the prism. Rectangle UVWT is an inclined plane. PU, QV, RW and ST are vertical edges.

Rajah 15.1 menunjukkan sebuah pepejal prisma tegak dengan tapak segi empat tepat PQRS di atas satah mengufuk. PQVU ialah keratan rentas seragam prisma itu. Segi empat tepat UVWT ialah satah condong. Tepi PU, QV, RW dan ST adalah tegak.

Draw to full scale, the elevation of the solid on a vertical plan parallel to PQ as viewed from X.

Lukis dengan skala penuh, dongakan pepejal itu pada satah mencancang yang selari dengan PQ sebagaimana yang dilihat dari X.

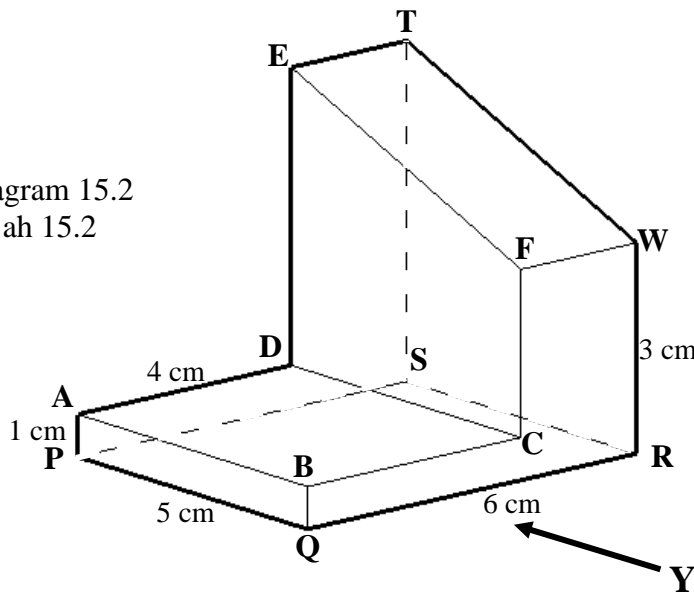
Diagram 15.1  
Rajah 15.1



- (b) A solid right prism with uniform cross-section CDEF is removed from the solid in Diagram 15.1. The remaining solid is shown in Diagram 15.2. Rectangle ABCD is a horizontal plane and CDEF is a vertical plane.

Sebuah pepejal berbentuk prisma tegak dengan keratan rentas seragam CDEF dikeluarkan daripada pepejal di Rajah 15.1. Pepejal yang tinggal adalah seperti dalam Rajah 15.2. Segi empat tepat ABCD ialah satah mengufuk dan CDEF ialah satah mencancang.

Diagram 15.2  
Rajah 15.2



**SULIT**

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Draw full scale,

*Lukiskan dengan skala penuh,*

(i) the plan of the remaining solid,  
*pelan pepejal yang tinggal itu,*

(ii) the elevation of the remaining solid on a vertical plane parallel to QR as viewed from Y.  
*dongakan pepejal yang tinggal itu pada satah yang mencancang yang selari dengan QR  
sebagaimana dilihat dari Y.*

[9 marks]

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

16. P(25°S, 40°E), Q(q°N, 40°E), R(25°S, 10°W) and V are four points on the surface of the earth. PV is a diameter of the earth.

*P(25°S, 40°E), Q(q°N, 40°E), R(25°S, 10°W) dan V adalah empat titik di permukaan bumi. PV ialah diameter bumi.*

(a) State the location of point V.

*Nyatakan kedudukan titik V.*

(3 marks/markah)

(b) Q is 2100 nautical miles from P measured along the same meridian. Find the value of q.

*Q adalah 2100 batu nautika dari P diukur sepanjang meridian yang sama. Cari nilai q.*

(3 marks/markah)

(c) Calculate the distance, in nautical mile, from P due west to R measured along the common parallel of latitude.

*Hitung jarak, dalam batu nautika, dari P arah ke barat ke R diukur sepanjang selarian latitud sepunya.*

(3 marks/markah)

(d) An aeroplane took off from Q and flew due south to P. Then, it flew due west to R. The average speed of the aeroplane for the whole flight was 500 knots. Calculate the total time, in hours, taken for the whole flight.

*Sebuah kapal terbang berlepas dari Q dan terbang arah ke selatan ke P. Kemudian kapal terbang itu terbang arah ke barat ke R. Purata laju kapal terbang bagi keseluruhan penerbangan itu ialah 500 knot. Hitung jumlah masa, dalam jam, yang diambil bagi seluruh penerbangan itu.*

(3 marks/markah)

Answer/ Jawapan :

(a)

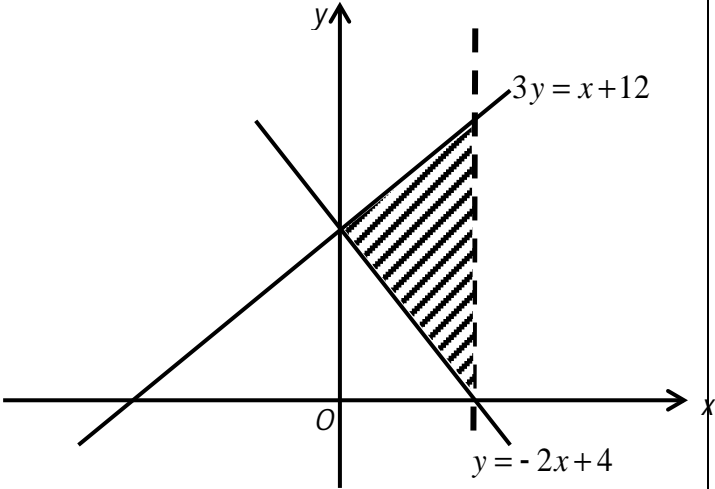
(b)

(c)

(d)

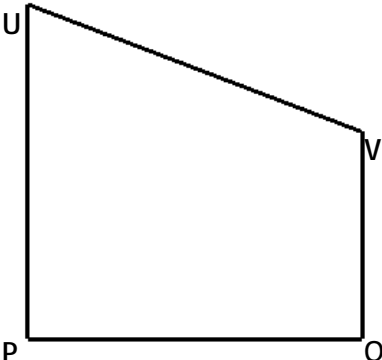
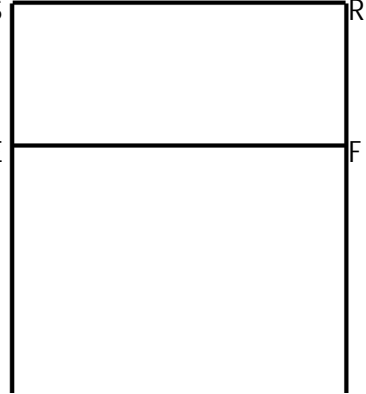


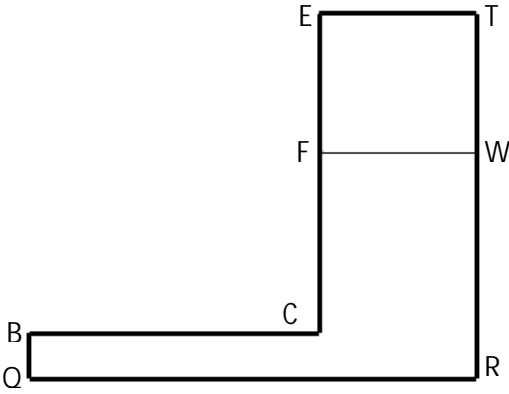
**SMK TAMAN BUKIT INDAH**  
**MARKING SCHEME**  
**PEPERIKSAAN PERCUBAAN SPM 2012**  
**MATHEMATICS**

QUESTION	SOLUTION AND MARK SCHEME	SUB MARK	MARK
<b>1</b>	<div style="text-align: center;">  </div> <p>Straight dotted line <math>x=2</math> correctly drawn.            The region correctly shaded.            Note: Award P1 to correct region with straight full line <math>x=2</math> or to shaded region bounded by 2 inequalities.</p>	K1 P2	<u>3</u>
<b>2</b>	$4v - 6w = 26$ or equivalent $-7w = 21$ or equivalent  OR $v = \frac{13 + 3w}{2}$ or $w = 5 - 4v$ (K1) $7w = -21$ or $14v = 28$ (K1)  OR $\begin{pmatrix} v \\ w \end{pmatrix} = \frac{1}{2(1) - (-3)(4)} \begin{pmatrix} 1 & 3 \\ -4 & 2 \end{pmatrix} \begin{pmatrix} 13 \\ 5 \end{pmatrix}$ (K2) Note: Attempt to write matrix equation, award K1  $v = 2$ $w = -3$	K1 K1    N1 N1	     <b>4</b>
<b>3</b>	$3x^2 - 11x - 4 = 0$ or equivalent $(3x + 1)(x - 4) = 0$ or equivalent $x = -\frac{1}{3}$ or $x = 4$	K1 K1 N1N1	<b>4</b>
<b>4</b>	a) Identify $\Delta LNM$ b) $\tan q = \frac{12}{4}$ or equivalent $q = 71.57^\circ$	P1 K1 N1	<b>3</b>

QUESTION	SOLUTION AND MARK SCHEME	SUB MARK	MARK
5	(a) True (b) If $2x = 10$ then $x = 5$ If $x = 5$ then $2x = 10$ (c) $n^2 + 2n, n = 1, 2, 3, 4...$ Note: $n^2 + 2n$ only award K1	P1 P1 P1 K2	5
6	(a) (0, 5) (b) $m_{RT} = m_{ps} = -\frac{1}{3}$ $\frac{4-0}{h-0} = -\frac{1}{3}$ $h = -12$ $y = -\frac{1}{3}x$	B1 K1  K1  N1 N1	5
7	$\frac{1}{2} \times 3.142 \times 5^2 \times 10$ $10 \times 10 \times 10$ $10 \times 10 \times 10 - \frac{1}{2} \times 3.142 \times 5^2 \times 10$ 607.25	K1  K1 K1  N1	4
8	a) $m = 1$ $n = -\frac{5}{2}$ b) $\begin{pmatrix} 5 & -8 \\ 1 & -2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 9 \\ 3 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{5(-2) - (-8)(1)} \begin{pmatrix} -2 & 8 \\ -1 & 5 \end{pmatrix} \begin{pmatrix} 9 \\ 3 \end{pmatrix}$ $x = -3, y = -3$ Note: $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -3 \\ -3 \end{pmatrix}$ as final answer, award N1	P1 P1  P1  K2  N1N1	7
9	(a) $\frac{45}{360} \times 2 \times \frac{22}{7} \times 14$ $\frac{45}{360} \times 2 \times \frac{22}{7} \times 14 + 14 + 14 + 14 + 14$ 67 (b) $\frac{45}{360} \times \frac{22}{7} \times 14 \times 14$ or $\frac{90}{360} \times \frac{22}{7} \times 14 \times 14$ $\frac{45}{360} \times \frac{22}{7} \times 14 \times 14 + 14 \times 14 - 2(\frac{90}{360} \times \frac{22}{7} \times 14 \times 14 -$ $\frac{1}{2} \times 14 \times 14)$ OR $\frac{45}{360} \times \frac{22}{7} \times 14 \times 14 + 2(14 \times 14 -$ $\frac{90}{360} \times \frac{22}{7} \times 14 \times 14)$ 161	K1  K1  N1  K1  K1  N1	6
10	$S = \{2Y, 2R, 3Y, 3R, 6Y, 6R\}$ (a) $\{2Y, 6Y\}$ $\frac{1}{3}$ (b) $\{3Y, 3R, 6Y, 6R, 2R\}$ $\frac{5}{6}$	B1 K1 N1  K1 N1	5
11	(a) $20\text{ms}^{-1}$ (b) $\frac{20-12}{4-0}$ or equivalent	B1 K1 N1	

QUESTION	SOLUTION AND MARK SCHEME	SUB MARK	MARK																											
	(c) $\frac{1}{2} \times 4 \times 32 + 20(t - 4) = 184$ 10	K2 N1	6																											
12	(a) 19 7 4 (b) <u>Graph</u> Axes drawn in correct directions with uniform scales for $-3 \leq x \leq 4$ and $0 \leq y \leq 40$ All 5 points and *3 points correctly plotted or curve passes through all points. Note: 6 or 7 points correctly plotted, award K1. A smooth and continuous curve without any straight line passes through all 8 correct points. (c) $21.5 \pm 0.5$ (d) Identify $y = 5x + 5$ Straight line $y = 5x + 5$ correctly drawn $0.75 \pm 0.05, 3.4 \pm 0.1$	K1 K1 K1 P1 K2 N1 P1 K1 K1 N1N1	12																											
13	(a) (i) (4, -2) (ii) (1, 0) (b) (i) (a) Rotation of $90^\circ$ clockwise at centre (1,1) Note: Rotation only, award P1. Rotation, $90^\circ$ clockwise or centre (1,1), award P2 (b) Enlargement at the centre F(4,0) with scale factor = 2 Note: Enlargement, scale factor = 2 or centre (4,0), award P2. Enlargement only, award P1. (ii) $x = \text{area ABCD}$ $x + 120 = (2^2) x$ 40	P1 P2 P3 P3 K2 N1	12																											
14	<table border="1"> <thead> <tr> <th>Class Interval</th> <th>Midpoint</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>10 - 12</td> <td>11</td> <td>2</td> </tr> <tr> <td>13 - 15</td> <td>14</td> <td>1</td> </tr> <tr> <td>16 - 18</td> <td>17</td> <td>3</td> </tr> <tr> <td>19 - 21</td> <td>20</td> <td>5</td> </tr> <tr> <td>22 - 24</td> <td>23</td> <td>8</td> </tr> <tr> <td>25 - 27</td> <td>26</td> <td>6</td> </tr> <tr> <td>28 - 30</td> <td>29</td> <td>5</td> </tr> <tr> <td>31 - 33</td> <td>32</td> <td>2</td> </tr> </tbody> </table>	Class Interval	Midpoint	Frequency	10 - 12	11	2	13 - 15	14	1	16 - 18	17	3	19 - 21	20	5	22 - 24	23	8	25 - 27	26	6	28 - 30	29	5	31 - 33	32	2	D1F1C1	
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25 - 27	26	6																												
28 - 30	29	5																												
31 - 33	32	2																												

QUESTION	SOLUTION AND MARK SCHEME	SUB MARK	MARK
	<p>(b) Modal class = 22 – 24</p> <p>(c) <math>\frac{11(2)+14(1)+17(3)+20(5)+23(8)+26(6)+29(5)+32(2)}{32}</math> 24.25</p> <p>(d) Histogram            Axes drawn in correct directions with uniform scales for <math>9.5 \leq x \leq 33.5</math> and <math>0 \leq y \leq 8</math>.            *9 bars drawn correctly using midpoint/upper boundaries/ class intervals.            Correct histogram using the given scales for <math>9.5 \leq x \leq 33.5</math> and <math>0 \leq y \leq 8</math>.            Note: For other scales used, award N0</p> <p>(e) The modal class is 22-24            OR            There is no children with body weight less than 9.5kg.            OR            There is no children with body weight more than 33.5kg.            OR            Any correct information from *histogram</p>	<p>P1</p> <p>K2</p> <p>N1</p> <p>P1</p> <p>K2</p> <p>N1</p> <p>K1</p>	<p>12</p>
<p>15</p>	<p>(a) </p> <p>Correct shape with all solid lines.  <math>QV &lt; PU</math>            Measurements correct to <math>\pm 0.2</math> cm (one way) and  <math>\angle UPQ</math> and <math>\angle VQP = 90^\circ \pm 1^\circ</math></p> <p>(b)(i) </p>	<p>K1</p> <p>K1</p> <p>N1</p>	

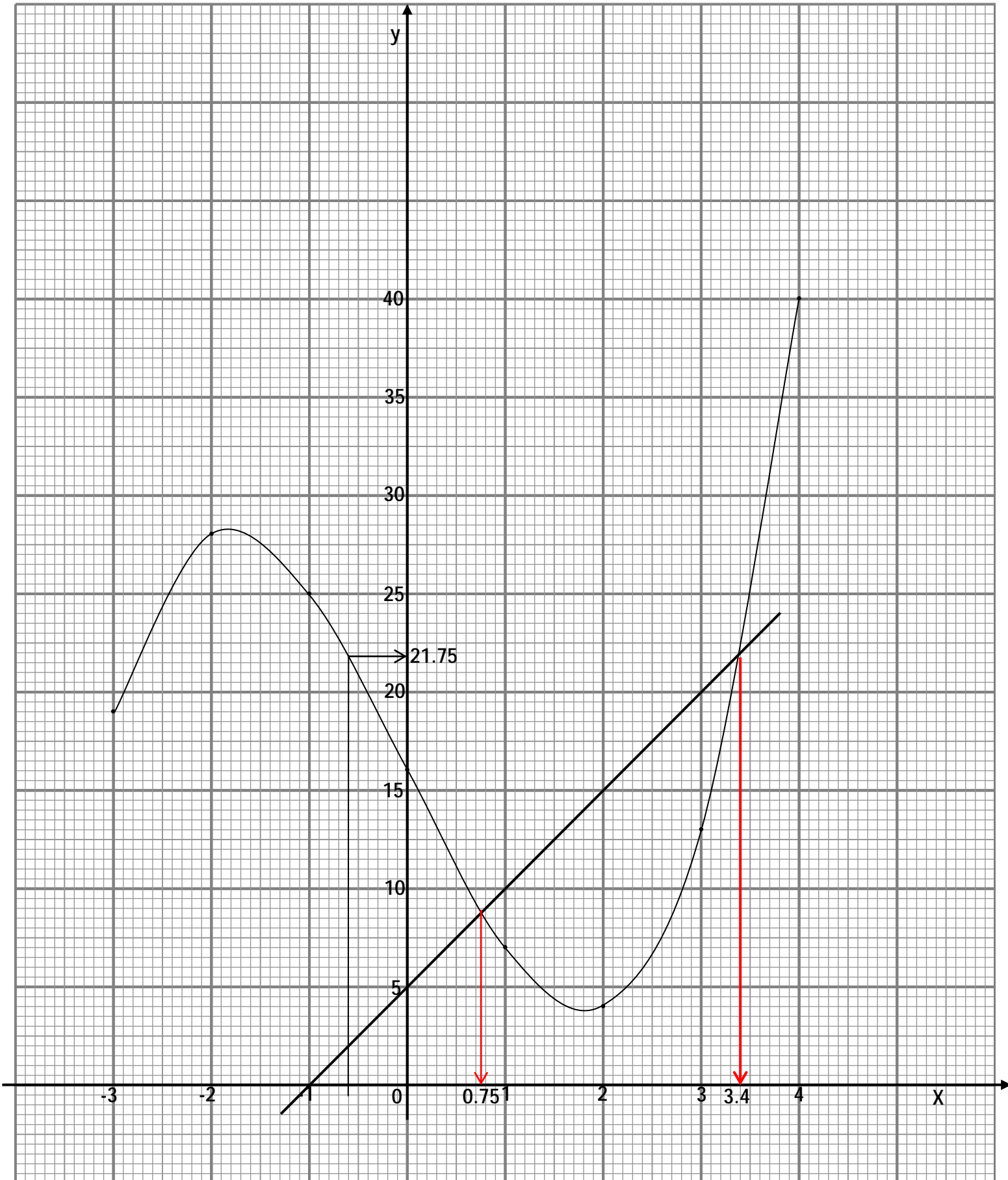
QUESTION	SOLUTION AND MARK SCHEME	SUB MARK	MARK
	Correct shape with all solid lines. $SE = RF < PE = FQ < PQ = RS$ Measurements correct to $\pm 0.2$ cm (one way) and all angles at vertices of rectangle GFJH and FEKJ = $90^\circ \pm 1^\circ$	K1 K1 N2	
	(b)(ii) <div style="text-align: center;">  </div> Correct shape. All solid lines. (Ignore FW) F is joined to W by a full line to form rectangle FWTE. W lies in between T and R. $QR > BC > WR > TW = TE = EF$ Measurements correct to $\pm 0.2$ cm (one way) and all angles at vertices = $90^\circ \pm 1^\circ$	K1  K1 K1  N2	<b>12</b>
<b>16</b>	(a) $(25^\circ\text{N}, 140^\circ\text{W})$ Note: $140^\circ$ or W, award P1 (b) $\frac{2100}{60}$ $35^\circ - 25^\circ$ $10^\circ$  (c) $50 \times 60 \times \cos 25^\circ$ Note: Use of $\cos 25^\circ$ , award K1 2718.92  (d) $2100 + 2718.92$ $\frac{2100 + 2718.92}{500}$ 9.64	P1P2  K1  K1 N1  K2 N1  K1 K1  N1	<b>12</b>

Prepared by

Pn HjH Nora Abdul Jalil



Graph for Question 12/ Graf untuk soal 12



Graph for Question 14/ Graf untuk soalan 14

