

SULIT



JABATAN PELAJARAN NEGERI
WILAYAH PERSEKUTUAN

PEPERIKSAAN PERCUBAAN SPM
MATEMATIK
TINGKATAN LIMA
Kertas 1

1449/1

September
2012

$1\frac{1}{4}$ jam

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. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Kertas soalan ini mengandungi 23 halaman bercetak

MATHEMATICAL FORMULAE
RUMUS MATEMATIK

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

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

RELATIONS
PERKAITAN

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

10 $P(A) = \frac{n(A)}{n(S)}$

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

11 $P(A') = 1 - P(A)$

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

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

12 $m = \frac{y_2 - y_1}{x_2 - x_1}$

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

13 $m = -\frac{y\text{-intercept}}{x\text{-intercept}}$

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

$m = -\frac{\text{pintasan } y}{\text{pintasan } x}$

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

14 Pythagoras Theorem
Teorem Pithagoras
 $c^2 = a^2 + b^2$

Purata laju = $\frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$

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

Min = $\frac{\text{Hasil tambah nilai data}}{\text{Bilangan data}}$

9 Mean = $\frac{\text{sum of (classmark} \times \text{frequency)}}{\text{sum of frequencies}}$

Min = $\frac{\text{Hasil tambah (nilai titik tengah kelas} \times \text{kekerapan)}}{\text{hasil tambah kekerapan}}$

SHAPES AND SPACE
BENTUK DAN RUANG

- | | |
|--|--|
| <p>1 Area of trapezium = $\frac{1}{2} \times$ sum of parallel sides \times height
 <i>Luas trapezium = $\frac{1}{2} \times$ hasil tambah dua sisi selari \times tinggi</i></p> | <p>11 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
 <i>Hasil tambah sudut pedalaman poligon = $(n - 2) \times 180^\circ$</i></p> |
| <p>2 Circumference of circle = $\pi d = 2\pi r$
 <i>Lilitan bulatan = $\pi d = 2\pi r$</i></p> | <p>12 $\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$</p> |
| <p>3 Area of circle = πr^2
 <i>Luas bulatan = πr^2</i></p> | <p>$\frac{\text{panjang lengkok lilitan bulatan}}{360^\circ} = \frac{\text{sudut pusat}}{360^\circ}$</p> |
| <p>4 Curved surface area of cylinder = $2\pi rh$
 <i>Luas permukaan melengkung silinder = $2\pi r h$</i></p> | <p>13 $\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$</p> |
| <p>5 Surface area of sphere = $4\pi r^2$
 <i>Luas permukaan sfera = $4\pi r^2$</i></p> | <p>$\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$</p> |
| <p>6 Volume of right prism = cross sectional area \times length
 <i>Isipadu prisma tegak = luas keratan rentas \times panjang</i></p> | <p>14 Scale factor, $k = \frac{PA'}{PA}$
 <i>Faktor skala, $k = \frac{PA'}{PA}$</i></p> |
| <p>7 Volume of cylinder = $\pi r^2 h$
 <i>Isipadu silinder = $\pi r^2 h$</i></p> | <p>15 Area of image = $k^2 \times$ area of object
 <i>Luas imej = $k^2 \times$ luas objek</i></p> |
| <p>8 Volume of cone = $\frac{1}{3} \pi r^2 h$
 <i>Isipadu kon = $\frac{1}{3} \pi r^2 h$</i></p> | |
| <p>9 Volume of sphere = $\frac{4}{3} \pi r^3$
 <i>Isipadu sfera = $\frac{4}{3} \pi r^3$</i></p> | |
| <p>10 Volume of right pyramid = $\frac{1}{3} \times$ base area \times height
 <i>Isipadu piramid tegak = $\frac{1}{3} \times$ luas tapak \times tinggi</i></p> | |

- 1 Round off 0.08305 correct to three significant figures.

Bundarkan 0.08305 betul kepada tiga angka bererti.

- A 0.083
- B 0.084
- C 0.0830
- D 0.0831

- 2 Express 8.56×10^{-3} as a single number.

Ungkapkan 8.56×10^{-3} sebagai satu nombor tunggal.

- A 0.00085
- B 0.00856
- C 0.0856
- D 0.856

- 3 $4.1 \times 10^{-8} - 5.2 \times 10^{-10} =$

- A 4.048×10^{-5}
- B 4.048×10^{-6}
- C 4.048×10^{-7}
- D 4.048×10^{-8}

- 4 The area of a rectangular garden is 6.4 km^2 . Given that the length of the garden is 4000 m. The width, in m, is

Luas sebuah taman berbentuk segi empat tepat ialah 6.4 km^2 . Diberi panjang taman ialah 4000 m.

Lebar taman dalam, m ialah

- A 1.6×10^{-3}
- B 1.6×10^1
- C 1.6×10^3
- D 1.6×10^4

- 5 $101011_2 + 1111_2 =$

- A 110000_2
- B 111000_2
- C 111010_2
- D 110011_2

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- 6 Given that $2m3_8 = 139$. Find the value of m .

Diberi $2m3_8 = 139$. Cari nilai m .

- A 1
- B 2
- C 3
- D 4

- 7 Diagram 7 shows a regular pentagon $ABCDE$. DEF is a straight line and $EA = EF$.

Rajah 7 menunjukkan sebuah pentagon sekata $ABCDE$. DEF ialah garis lurus dan $EA = EF$.

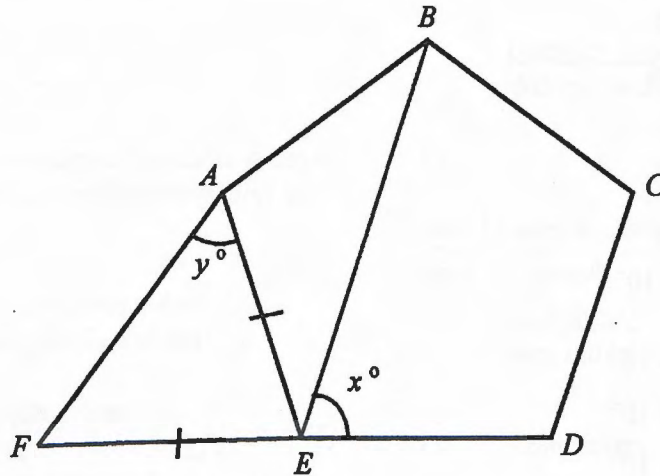


Diagram 7/ Rajah 7

The value of $x + y$ is

Nilai $x + y$ ialah

- A 108
- B 126
- C 144
- D 162

- 8 In Diagram 8, $ABCD$ is a quadrilateral and AB is parallel to CE .

Dalam Rajah 8, $ABCD$ ialah sebuah sisiempat dan AB adalah selari dengan CE .

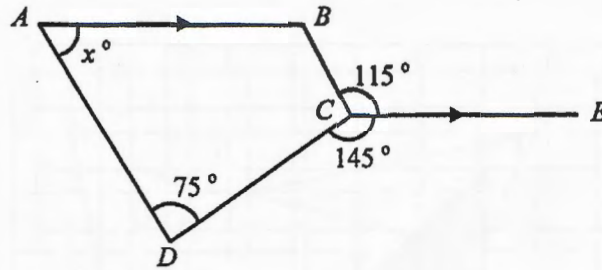


Diagram 8 / Rajah 8

The value of x is

Nilai x ialah

- A 65
B 70
C 80
D 120
- 9 In Diagram 9, SPU is a tangent to the circle PQR at P . RST is a straight line.
Dalam Rajah 9, SPU ialah tangen kepada bulatan PQR pada P . RST ialah garis lurus.

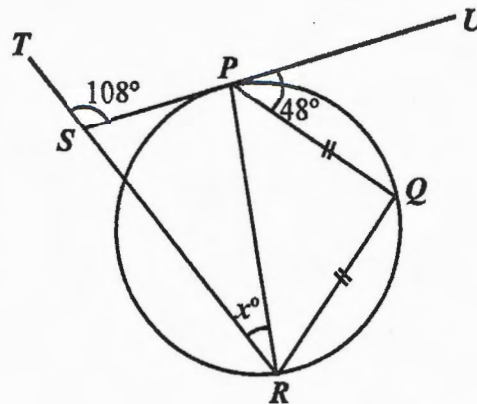


Diagram 9 / Rajah 9

Find the value of x .

Cari nilai x .

- A 19
B 24
C 72
D 84

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10 In Diagram 10, trapezium HJK is the image of the shaded diagram under an enlargement.

Dalam Rajah 10, trapezium HJK ialah imej bagi rajah yang dilorekkan di bawah pembesaran.

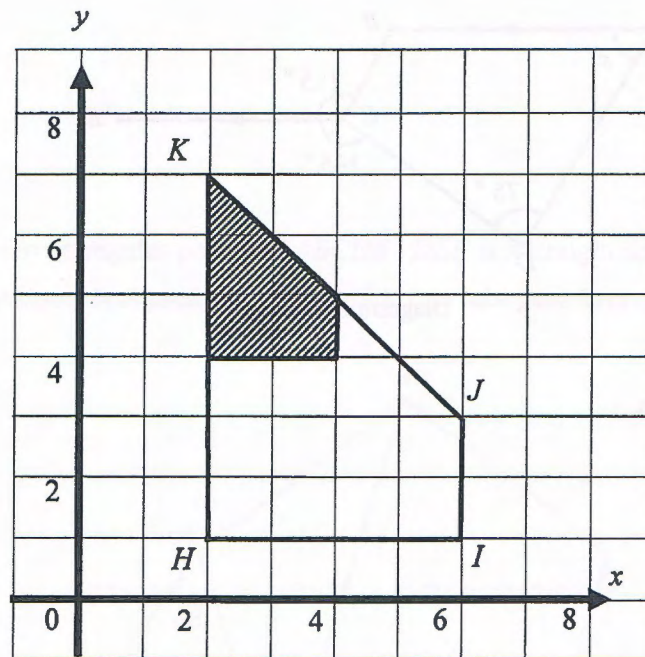


Diagram 10 / Rajah 10

Coordinate for the centre of enlargement is

Koordinat bagi pusat pembesaran ialah

- A (6,1)
- B (6,3)
- C (2,1)
- D (2,7)

11 Diagram 11 shows two triangles P and Q are drawn on a square grid.

Rajah 11 menunjukkan dua segitiga, P dan Q , dilukis pada grid segiempat sama.

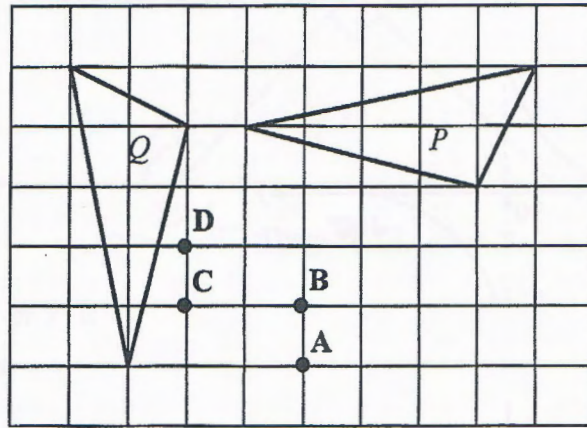


Diagram 11 / *Rajah 11*

Q is the image of P under a 90° anticlockwise rotation.

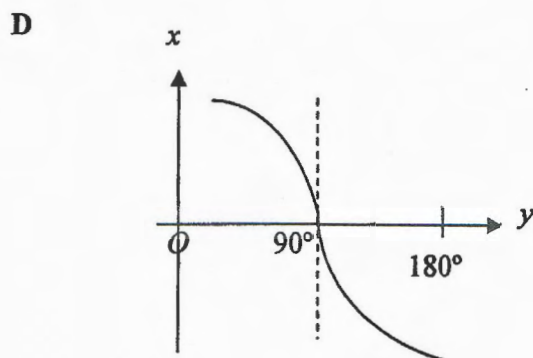
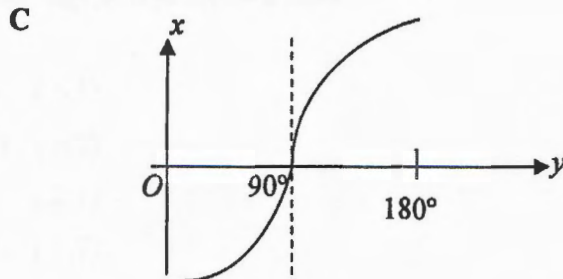
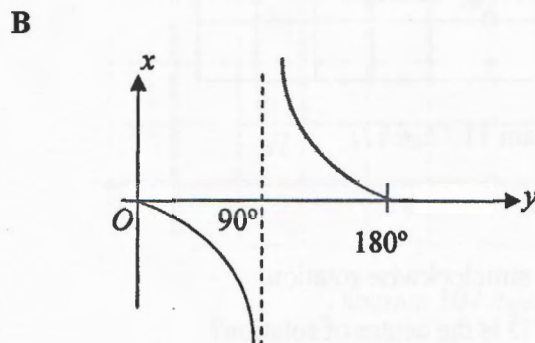
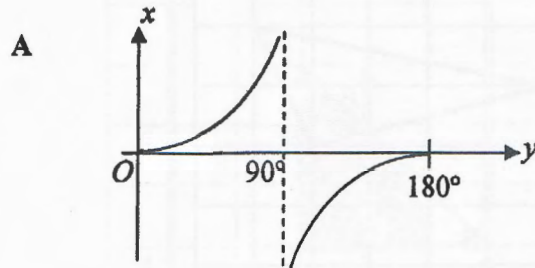
Which of the point A , B , C and D is the centre of rotation?

Q ialah imej bagi P di bawah satu putaran 90° lawan arah jam.

Antara titik A , B , C dan D , yang manakah pusat putaran itu ?

12 Which of the following represents the graph of $y = \tan x^\circ$ for $0^\circ \leq x \leq 180^\circ$?

Antara berikut, yang manakah mewakili graf $y = \tan x^\circ$ bagi $0^\circ \leq x \leq 180^\circ$?



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- 13 In Diagram 13, PRS is a straight line and PQR is an isosceles triangle.

Dalam Rajah 13, PRS ialah garis lurus dan PQR ialah segitiga sama kaki.

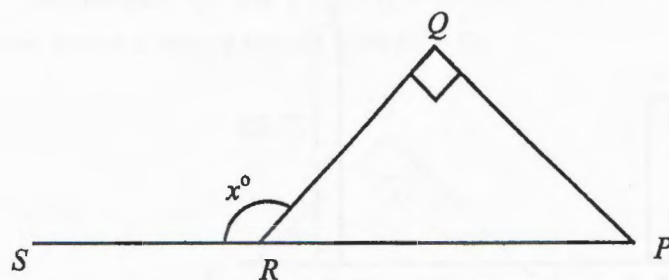


Diagram 13 / Rajah 13

The value of $\tan x^\circ$ is

Nilai $\tan x^\circ$ ialah

- A -1
 - B $-\frac{1}{2}$
 - C $-\frac{1}{2}$
 - D 1
- 14 Diagram 14 shows a right prism. Right-angled triangle WVU is a uniform cross-section of the prism.

Rajah 14 menunjukkan sebuah prisma tegak. Segitiga bersudut tegak WVU ialah keratan rentas seragam prisma itu.

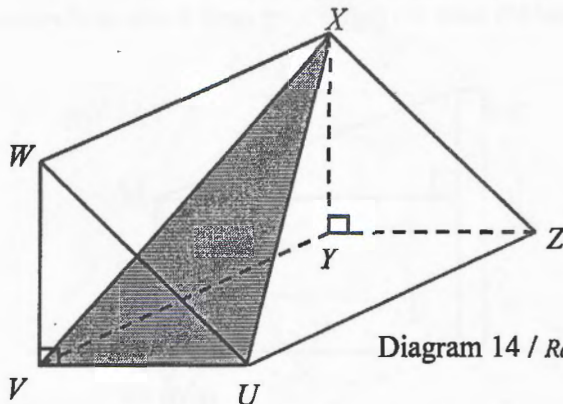


Diagram 14 / Rajah 14

Name the angle between the plane XVU and the plane $UVYZ$.

Namakan sudut di antara satah XVU dengan satah $UVYZ$.

- A $\angle XYV$
- B $\angle XVY$
- C $\angle VXY$
- D $\angle XUY$

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- 15 Diagram 15 shows two vertical poles WX and YZ , on a horizontal ground.

Rajah 15 menunjukkan dua tiang tegak WX dan YZ di atas satah mengufuk.

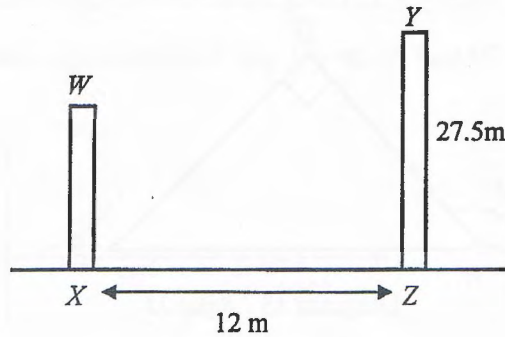


Diagram 15 / Rajah 15

The angle of elevation of point W from point Z is 58° .
Calculate the angle of depression of vertex W from Y .

Sudut dongakan titik W dari titik Z ialah 58° .

Hitung sudut tunduk puncak W dari Y .

- A $34^\circ 40'$
B $41^\circ 43'$
C $66^\circ 26'$
D $55^\circ 20'$
- 16 In Diagram 16, JKL and MN are two vertical poles on a horizontal ground.
Dalam Rajah 16, JKL and MN ialah dua batang tiang tegak di atas satah mengufuk.

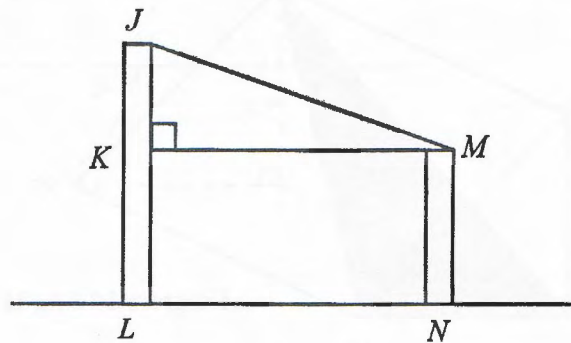


Diagram 16 / Rajah 16

Find the angle of elevation of point J from point M .

Cari sudut dongakan titik J dari M .

A $\angle MJK$

B $\angle JNL$

C $\angle KMJ$

D $\angle JML$

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- 17 Diagram 17 shows three points, E , F and G , on a horizontal plane.

It is given that G lies due north of E and $EG = GF$.

Rajah 17 menunjukkan tiga titik, E , F dan G di atas suatu satah mengufuk.

Diberikan bearing G terletak ke utara E dan $EG = GF$.

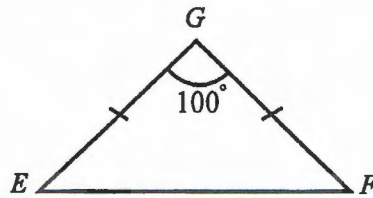


Diagram 17/Rajah 17

Find the bearing of E from F .

Carikan bearing E dari F .

- A 080°
 B 140°
 C 220°
 D 260°
- 18 Diagram 18 shows the positions of five cities, A , B , C , D and P on the surface of the earth.

Rajah 18 menunjukkan kedudukan lima bandar, A , B , C , D dan P di permukaan bumi.

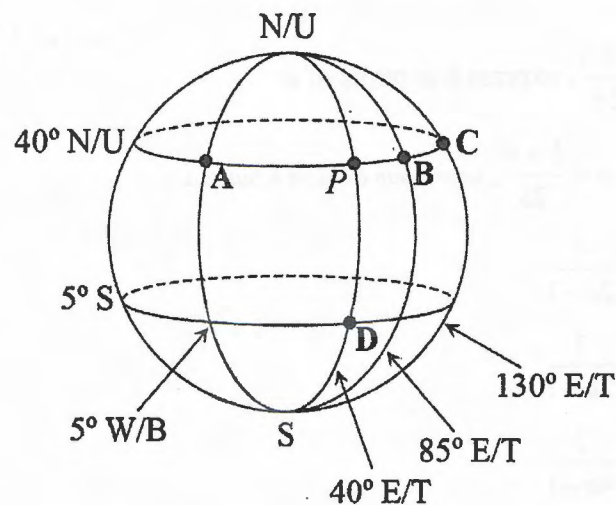


Diagram 18 / Rajah 18

Which of the cities A , B , C or D is located due west of P with a difference in longitudes of 45° ?

Yang manakah antara bandar-bandar A , B , C dan D berada di barat P dengan beza longitud 45° ?

19 $(2x - y)^2 - x(x - y) =$

- A $3x^2 - 3xy + y^2$
- B $3x^2 - 5xy + y^2$
- C $3x^2 + xy - y^2$
- D $3x^2 - 5xy - y^2$

20 Express $\frac{2t-3}{2} - \frac{t+3}{6}$ as a single fraction in its simplest form.

Ungkapkan $\frac{2t-3}{2} - \frac{t+3}{6}$ sebagai satu pecahan tunggal dalam bentuk termudah.

- A $\frac{3t-10}{6}$
- B $\frac{5t-2}{6}$
- C $\frac{2t-3}{6}$
- D $\frac{5t-12}{6}$

21 Given $a = \frac{b+4}{2b}$, express b in terms of a .

Diberi bahawa $a = \frac{b+4}{2b}$, ungkapkan b dalam sebutan a .

- A $b = \frac{4}{2a-1}$
- B $b = \frac{3}{2a-1}$
- C $b = \frac{2}{4a-1}$
- D $b = \frac{3}{2a-1}$

- 22 Given that $3 - 3h = 4 - 2(3 - h)$, find the value of h .

Diberi $3 - 3h = 4 - 2(3 - h)$, cari nilai h .

- A 1
- B 2
- C 6
- D 8

23 $\sqrt[3]{7^2} =$

- A $\left(\frac{1}{7}\right)^{\frac{2}{3}}$
- B $\left(\frac{1}{7}\right)^{\frac{3}{2}}$
- C $7^{\frac{2}{3}}$
- D $7^{\frac{3}{2}}$

- 24 Given that $2^{3x} = 32(2^{-x})$. Find the value of x .



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

- A $\frac{3}{4}$
- B 1
- C $\frac{5}{3}$
- D $\frac{5}{4}$

- 25 Given $3 - \frac{x}{2} < 5$, the smallest value of x is

Diberi $3 - \frac{x}{2} < 5$, nilai yang paling kecil bagi x ialah

- A -1
 B -2
 C -3
 D -4
- 26 Pictograph in Table 26 shows the sales of the cars in a company for 3 months.
 Piktograf dalam Jadual 26 menunjukkan jualan kereta bagi sebuah syarikat untuk 3 bulan tertentu.

Januari	
Februari	
Mac	



Represents 10 cars
 mewakili 10 buah kereta

Table 26 / Jadual 26

The total sales in February are not shown. The sales of the cars in February are 60% less than the sales in January.

Jumlah jualan pada bulan Februari tidak ditunjukkan. Jualan kereta pada bulan Februari adalah 60% kurang berbanding jualan pada bulan Januari.

If the information of the above pictograph is represented by a pie chart, calculate the angle of sector that represents the total sales of cars in February.

Jika maklumat dalam piktograf di atas diwakili oleh sebuah carta pai, kira sudut sektor yang mewakili jumlah kereta yang dijual pada bulan Februari.

- A 72°
 B 50°
 C 36°
 D 25°

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27 Table 27 shows the score of a group of students in a test.

Jadual 27 menunjukkan skor sekumpulan pelajar dalam suatu ujian.

Score	Frequency	Cumulative frequency
1 – 10	0	0
11 – 20	1	1
21 – 30	2	3
31 – 40	4	m
41 – 50	n	20
51 – 60	10	30

Table 27 / *Jadual 27*

Find the values of m and n .

Cari nilai m dan n .

A $m = 4, n = 16$

B $m = 5, n = 15$

C $m = 6, n = 14$

D $m = 7, n = 13$

28 Table 28 shows the distribution of scores of a group of pupils in a competition.

Jadual 28 menunjukkan taburan skor bagi sekumpulan murid dalam satu pertandingan.

Score <i>Skor</i>	10	20	30	40	50	60
Frequency <i>Frekuensi</i>	4	6	3	2	8	7

Table 28/ *Jadual 28*

The median score is

Skor median ialah

A 40

B 45

C 50

D 55

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29 In Diagram 29, the Venn diagram shows set $\xi = M \cup N \cup P$.

Dalam Rajah 29, gambar rajah Venn menunjukkan set $\xi = M \cup N \cup P$.

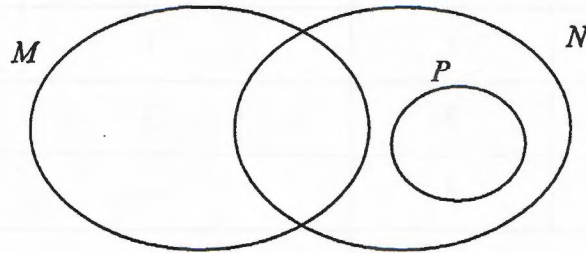


Diagram 29 / Rajah 29

Which of the following is true about the relationship between the sets?

Antara berikut, yang manakah benar tentang hubungan antara set?

- A $N \subset P$
 - B $M \cap P = \phi$
 - C $N \cup P = P$
 - D $(M \cap N) \subset P$
- 30 Diagram 30 shows a Venn diagram with the universal set, $\xi = P \cup Q$.
- Rajah 30 menunjukkan sebuah gambar rajah Venn dengan set semesta $\xi = P \cup Q$.

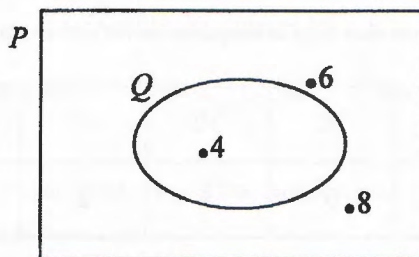


Diagram 32 / Rajah 32

List all the subsets of set Q.

Senaraikan semua subset bagi set Q.

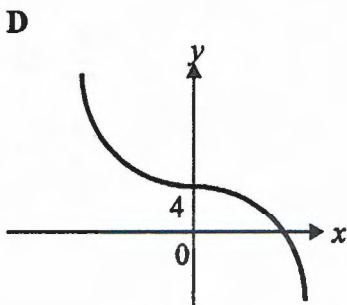
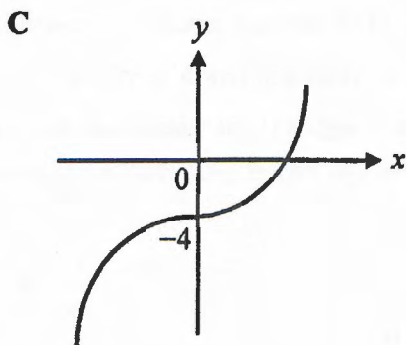
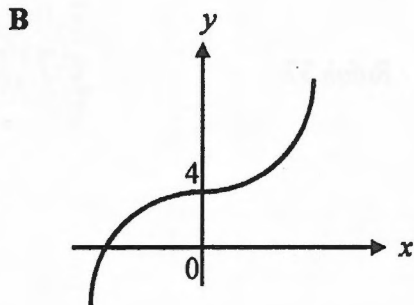
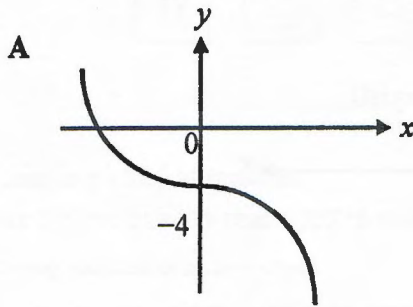
- A $\{4\}$
- B $\{ \}, \{4\}$
- C $\{4\}, \{6\}, \{8\}, \{4,6\}, \{4,8\}$

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D { }, {4}, {6}, {8}, {4,6}, {4,8}

31 Which of the following graphs represents $y = x^3 + 4$?

Antara graf yang berikut, yang manakah mewakili $y = x^3 + 4$?



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- 32 Diagram 32 shows a straight line AB with gradient $-\frac{1}{2}$ in a Cartesian plane.

Rajah 32 menunjukkan garis lurus AB dengan kecerunan $-\frac{1}{2}$ pada suatu satah Cartesian.

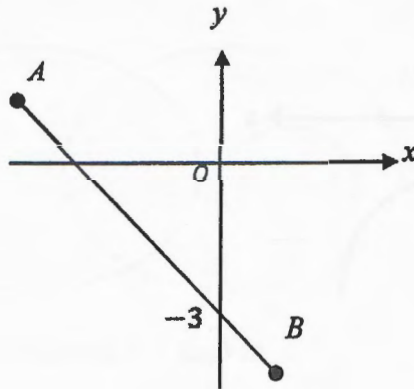


Diagram 32 / Rajah 32

Find the x -intercept of the straight line AB .

Cari pintasan- x bagi garis lurus AB .

- A -6
 B $-\frac{3}{2}$
 C $\frac{3}{2}$
 D 6
- 33 The gradient of the straight line $\frac{3}{5}y - 3x = 24$ is

Kecerunan bagi garis lurus $\frac{3}{5}y - 3x = 24$ ialah

- A -5
 B -3
 C $\frac{9}{5}$
 D 5

- 34 Diagram 34 shows some number cards.

Rajah 34 menunjukkan beberapa keping kad nombor.

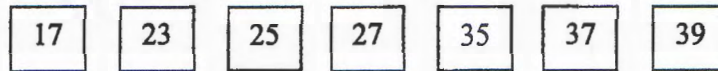


Diagram 34 / Rajah 34

A card is picked at random.

State the probability that a prime number is picked.

Sekeping kad dipilih secara rawak.

Nyatakan kebarangkalian bahawa kad yang dipilih ialah kad nombor perdana.

A $\frac{2}{7}$

B $\frac{3}{7}$

C $\frac{4}{7}$

D $\frac{5}{7}$

- 35 40 coupons with serial number 11 to 50 are put in the box. One coupon is drawn at random.

The probability of drawing a coupon with a number which is **not** a multiple of 5 is

40 kupon dengan nombor siri 11 hingga 50 diletak dalam sebuah kotak. Satu kupon dicabut secara rawak.

Kebarangkalian kupon yang dicabut dengan nombor siri bukan gandaan 5 ialah

A $\frac{7}{40}$

B $\frac{1}{5}$

C $\frac{9}{40}$

D $\frac{4}{5}$

- 36 Which of the following variations shows that x varies directly as the square root of y ?

Antara ubahan berikut, yang manakah menunjukkan bahawa x berubah secara langsung dengan punca kuasa dua y ?

- A $x \propto y^{\frac{1}{2}}$
 B $x \propto y^2$
 C $x \propto \frac{1}{y^{\frac{1}{2}}}$
 D $x \propto \frac{1}{y^2}$

- 37 Given that $z \propto \frac{\sqrt{x}}{27y^2}$ and $z = 72$ when $x = 576$ and $y = 3$, express z in terms of x and y .

Diberi bahawa $z \propto \frac{\sqrt{x}}{27y^2}$ dan $z = 72$ apabila $x = 576$ dan $y = 3$, ungkapkan z dalam sebutan x dan y .

- A $\frac{\sqrt{x}}{27y^2}$
 B $\frac{27\sqrt{x}}{y^2}$
 C $\frac{\sqrt{27x}}{y^2}$
 D $\frac{\sqrt{x}}{(27y)^2}$

- 38 The table below shows some values of variables m , n and p .

Jadual berikut menunjukkan beberapa nilai pembolehubah m , n dan p .

m	18	q
n	12	36
p	6	12

If m varies directly as n and inversely as p , calculate the value of q .

Jika m berubah secara langsung dengan n dan berubah secara songsang dengan p , hitung nilai q .

- A 27
 B 36
 C 48
 D 108

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$$39 \quad \begin{pmatrix} 2 & -1 \\ 6 & 3 \end{pmatrix} + \begin{pmatrix} -3 & 4 \\ 0 & -1 \end{pmatrix} - \begin{pmatrix} -2 & 5 \\ -4 & 7 \end{pmatrix} =$$

A $\begin{pmatrix} -3 & 8 \\ -10 & -9 \end{pmatrix}$

B $\begin{pmatrix} -3 & -2 \\ 10 & -9 \end{pmatrix}$

C $\begin{pmatrix} 1 & -2 \\ 10 & -5 \end{pmatrix}$

D $\begin{pmatrix} 1 & 8 \\ -2 & -5 \end{pmatrix}$

$$40 \quad \text{Given that } \begin{pmatrix} 2 & -3 \\ x & 0 \end{pmatrix} + \begin{pmatrix} 5 & 4 \\ -2 & 1 \end{pmatrix} = \begin{pmatrix} 7 & y \\ 4 & 1 \end{pmatrix},$$

Find the values of x and of y .

Diberi bahawa $\begin{pmatrix} 2 & -3 \\ x & 0 \end{pmatrix} + \begin{pmatrix} 5 & 4 \\ -2 & 1 \end{pmatrix} = \begin{pmatrix} 7 & y \\ 4 & 1 \end{pmatrix},$

Cari nilai x dan y .

A $x = 2, y = 1$

B $x = 2, y = -1$

C $x = 4, y = 2$

D $x = 6, y = 1$

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

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INFORMATION FOR CANDIDATES

1. This question paper consists of 40 questions
Kertas ini mengandungi 40 soalan.
2. Answer all questions.
Jawab semua soalan.
3. Answer each questions by blackening the correct space on the objective answer sheet.
Jawab setiap soalan dengan menghitamkan ruangan yang betul pada kertas jawapan objektif.
4. Blacken only one space for each question.
Hitamkan satu ruangan sahaja bagi setiap soalan.
5. If you wish to change your answer, erase the blackened mark that you have done. Then blackened the space for the new answer.
Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.
6. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. A list of formulae is provided on pages 2 to 3.
Satu senarai rumus disediakan di halaman 2 hingga 3.
8. A booklet of four-figure mathematical tables is provided.
Sebuah buku sifir matematik empat angka disediakan.
9. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik.



**JABATAN PELAJARAN NEGERI
WILAYAH PERSEKUTUAN**

**PEPERIKSAAN PERCUBAAN SPM
TINGKATAN 5
2012**

MATEMATIK

Kertas 1
1449/1

SKEMA PEMARKAHAN

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

JPNWP
PEPERIKSAAN PERCUBAAN SPM TAHUN 2012
MATHEMATICS PAPER 1
SUMMARY OF TEST SPECIFICATION

Question	TOPICS	Knowledge	Understanding	Application	Analysis	Synthesis	Evaluation	Level	Marks
1	Standard Form	x							1
2	Standard Form	x							1
3	Standard Form		x						1
4	Standard Form			x					1
5	Number Bases	x							1
6	Number Bases		x						1
7	Polygons		x						1
8	Polygons			x					1
9	Circle III			x					1
10	Transformation	x							1
11	Transformation	x							1
12	Trigonometry	x							1
13	Trigonometry			x					1
14	Lines and Plane in 3D								1
15	Angles of Elevation & Depression			x					1
16	Angles of Elevation & Depression	x							1
17	Bearing	x							1
18	Earth as a sphere	x							1
19	Algebraic Expressions		x						1
20	Algebraic Expressions			x					1
21	Algebraic Formulae		x						1
22	Linear Equation I		x						1
23	Indices	x							1
24	Indices		x						1
25	Linear Inequalities		x						1
26	Statistics		x						1
27	Statistics	x							1
28	Statistics			x					1
29	Sets	x							1
30	Sets	x							1
31	Graphs of function	x							1
32	Straight line		x						1
33	Straight line		x						1
34	Probability		x						1
35	Probability			x					1
36	Variation	x							1
37	Variation			x					1
38	Variation			x					1
39	Matrices			x					1
40	Matrices			x					1
	Kekerapan	15	19	6				Total	40

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NAMA:..... TING:.....

1449/2
 Matematik
 Kertas 2
 Sept
 2012
 2½ jam



JABATAN PELAJARAN NEGERI WILAYAH PERSEKUTUAN
 PEPERIKSAAN PERCUBAAN SPM 2012

MATEMATIK
 Kertas 2
 Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis nama dan tingkatan anda pada ruang yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Malaysia.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam Bahasa Inggeris atau Bahasa Malaysia.*
5. *Calon dikehendaki membaca arahan di halaman 2.*

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

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 Kertas soalan ini mengandungi 29 halaman bercetak
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**INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON**

- 1 This question paper consists of two sections : Section A and Section B.
Kertas soalan ini mengandungi dua bahagian : Bahagian A dan Bahagian B.
- 2 Answer all questions in Section A and four questions from Section B.
Jawab semua soalan dalam Bahagian A dan empat soalan daripada Bahagian B.
- 3 Write your answers clearly in the spaces provided in the question paper.
Jawapan anda hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.
- 4 Show your working. It may help you to get marks.
Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.
- 5 If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
Sekiranya anda hendak menukar jawapan, batalkan dengan kemas jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.
- 6 The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
- 7 The marks allocated for each question and sub-part of a question are shown in brackets.
Markah yang diperuntukkan bagi setiap soalan dan ceraihan soalan ditunjukkan dalam kurungan.
- 8 A list of formulae is provided on pages 3 to 5.
Satu senarai rumus disediakan di halaman 3 hingga 5.
- 9 You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.
- 10 Hand in this question paper to the invigilator at the end of the examination.
Serahkan kertas soalan ini kepada pengawas peperiksaan pada akhir peperiksaan.

MATHEMATICAL FORMULAE
RUMUS MATEMATIK

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

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

RELATIONS
PERKAITAN

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

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SHAPES AND SPACE
BENTUK DAN RUANG

- 1 Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
Luas trapezium = $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$
- 2 Circumference of circle = $\pi d = 2\pi r$
Lilitan bulatan = $\pi d = 2\pi r$
- 3 Area of circle = πr^2
Luas bulatan = πr^2
- 4 Curved surface area of cylinder = $2\pi r h$
Luas permukaan melengkung silinder = $2\pi r h$
- 5 Surface area of sphere = $4\pi r^2$
Luas permukaan sfera = $4\pi r^2$
- 6 Volume of right prism = cross sectional area \times length
Isipadu prisma tegak = luas keratan rentas \times panjang
- 7 Volume of cylinder = $\pi r^2 h$
Isipadu silinder = $\pi r^2 h$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
Isipadu kon = $\frac{1}{3} \pi r^2 h$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
Isipadu sfera = $\frac{4}{3} \pi r^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
Isipadu piramid tegak = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
- 11 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
Hasil tambah sudut pedalaman poligon = $(n - 2) \times 180^\circ$

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

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

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

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

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

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

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

$$\text{Luas imej} = k^2 \times \text{luas objek}$$

Section A
Bahagian A

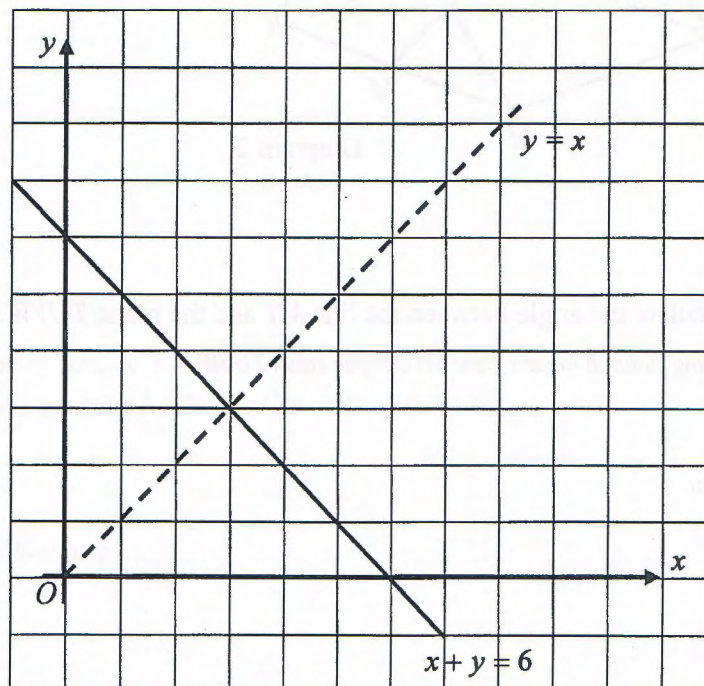
[52 marks]

[52 markah]

- 1 On the graph in the answer space, shade the region which satisfies the three inequalities $x + y \geq 6$, $y > x$ and $y < 6$.
Pada graf di ruang jawapan, lorek rantau yang memuaskan ketiga-tiga ketaksamaan $x + y \geq 6$, $y > x$ dan $y < 6$.

[3 marks/markah]

Answer/Jawapan:



- 2 Diagram 2 shows a right prism with a horizontal rectangular base $PQRS$. $VUQR$ is a trapezium. M is the midpoint of QR . U is above M vertically.
- Rajah 2 menunjukkan sebuah prisma tegak dengan tapak segiempat tepat $PQRS$ mengufuk. $VUQR$ ialah sebuah trapezium. M ialah titik tengah QR . Titik U berada tegak di atas titik M .

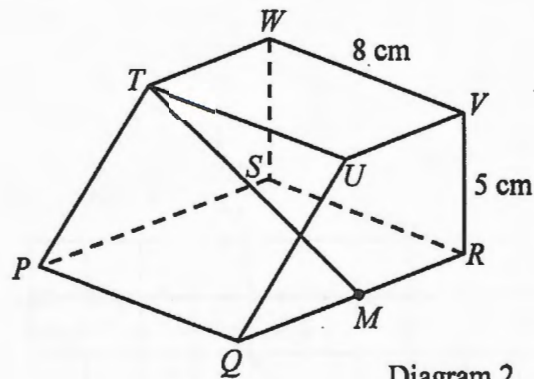


Diagram 2
Rajah 2

Identify and calculate the angle between the line MT and the plane $TUVW$.
Kenalpasti dan hitung sudut di antara garis MT dengan satah $TUVW$.

[3 marks/markah]

Answer/Jawapan:

- 3 Calculate the values of u and of v that satisfy the simultaneous linear equations:
Hitungkan nilai u dan nilai v yang memuaskan persamaan linear serentak berikut :

$$5u - 2v = 16$$

$$u + 4v = -10$$

[4 marks/markah]

Answer /Jawapan:

- 4 Solve the quadratic equation $x(2x - 5) = 12$.
Selesaikan persamaan kuadratik $x(2x - 5) = 12$.

[4 marks/markah]

Answer /Jawapan:

- 5 Diagram 5 shows a solid cuboid. A quadrant cylinder is taken out of the solid.
Rajah 5 menunjukkan sebuah pepejal berbentuk kuboid. Sebuah sukuan silinder dikeluarkan daripada pepejal itu.

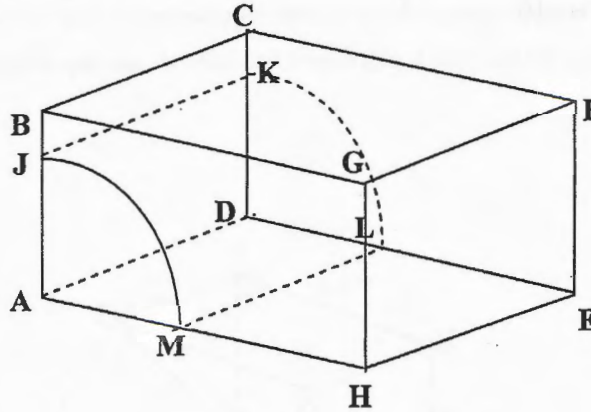


Diagram 5
Rajah 5

It is given that $AH = 6$ cm, $AD = 4$ cm, $AB = 5$ cm and $HM = 3$ cm,

Calculate the volume, in cm^3 , of the remaining solid. $\left(\text{Use } \pi = \frac{22}{7} \right)$

Diberi bahawa $AH = 6$ cm, $AD = 4$ cm, $AB = 5$ cm dan $HM = 3$ cm.

Kirakan isi padu, dalam cm^3 , pepejal yang tinggal itu. $\left(\text{Gunakan } \pi = \frac{22}{7} \right)$

[4 marks/markah]

Answer/Jawapan:

- 6 (a) Complete each of the following statements using the quantifier "all" or "some" to make it a false statement.

Lengkapkan setiap pernyataan berikut dengan menggunakan pengkuantiti "semua" atau "sebilangan" untuk membentuk satu pernyataan palsu.

- (i) isosceles triangles have equal sides.
..... segi tiga sama kaki mempunyai sisi yang sama panjang.
- (ii) multiple of five are odd numbers.
..... nombor gandaan lima adalah nombor ganjil.

- (b) Write two implications based on the following statement:

Tuliskan dua implikasi berdasarkan pernyataan berikut:

$x + 2 = 5$ if and only if $x = 3$ $x + 2 = 5$ jika dan hanya jika $x = 3$

- (c) It is given that the volume of a right prism is area of cross-section multiplied by the length of the prism.

Make one conclusion by deduction of volume of a cube with the length of 6 cm.

Diberi bahawa isipadu sebuah prisma ialah luas keratan rentas darab panjang prisma tersebut. Buat satu kesimpulan secara deduksi tentang isipadu sebuah kiub dengan sisi 6 cm.

[5 marks/markah]

Answer/Jawapan:

- (a) (i)
(ii)

(b) Implication 1/Implikasi 1:.....

Implication 2/Implikasi 2:.....

(c)
.....

- 7 In Diagram 7, PQ and RS are straight lines. Point P lies on the y -axis and point Q lies on the x -axis. Straight line PQ is parallel to straight line RS.
 Dalam Rajah 7, PQ dan RS ialah garis lurus. Titik P terletak pada paksi- y dan titik Q terletak pada paksi- x . Garis lurus PQ adalah selari dengan garis lurus RS.

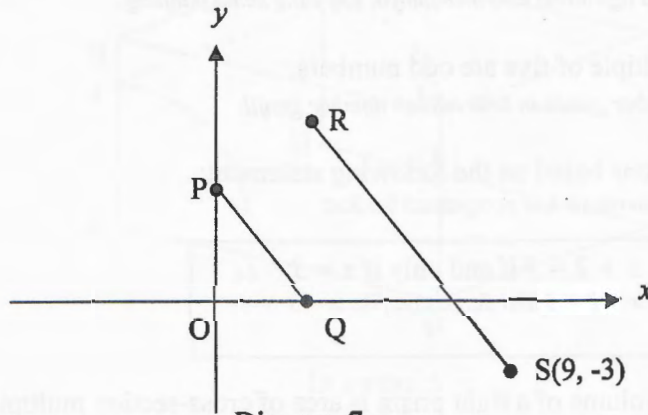


Diagram 7
Rajah 7

The equation of PQ is $3x + y = 9$.
 Persamaan PQ adalah $3x + y = 9$.

- (a) Find the equation of the straight line RS.
 Carikan persamaan garis lurus RS.
- (b) The x -intercept of the straight line RS.
 Pintasan- x bagi garis lurus RS.

[5 marks/markah]

Answer/Jawapan:

(a)

(b)

8 Table 8 shows the number of and the type of school in three zones, Sentul, Keramat and Pudu.
Jadual 8 menunjukkan bilangan dan jenis sekolah yang terdapat di tiga zon, Sentul, Keramat dan Pudu.

Type of school <i>Jenis Sekolah</i>	Number of school <i>Bilangan Sekolah</i>		
	<i>Zone/Zon Sentul</i>	<i>Zone/Zon Keramat</i>	<i>Zone/Zon Pudu</i>
<i>Daily School Sekolah Harian</i>	4	3	5
<i>Residential school Sekolah Berasrama Penuh</i>	1	2	3

Table 8 /Jadual 8

A new teacher is to be posted to any of the schools in the zone, either in Sentul, Keramat or Pudu.

The probability that he will be posted in Sentul is $\frac{1}{3}$ and in Keramat is $\frac{1}{4}$.

Seorang guru baru hendak ditempatkan di mana-mana sekolah, sama ada di zon Sentul, Keramat atau Pudu.

Kebarangkalian beliau ditempatkan di Sentul ialah $\frac{1}{3}$ dan di Keramat ialah $\frac{1}{4}$.

Find the probability that the teacher will be posted

Carikan kebarangkalian bahawa guru itu akan ditempatkan

- (a) to a daily school in Sentul zone,
di sebuah sekolah harian zon Sentul,
- (b) to a Residential school.
di sebuah sekolah berasrama penuh.

[5 marks /5 markah]

Answer/Jawapan:

(a)

(b)

- 9 Diagram 9 shows quadrant ORT and semicircle MPN , both with centre O .
Rajah 9 menunjukkan sukuan ORT dan semibulatan MPN , kedua-duanya berpusat O .

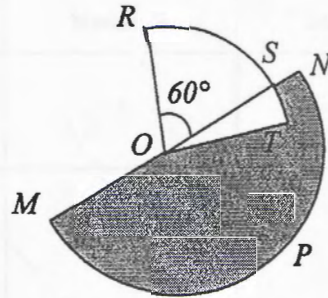


Diagram 9
Rajah 9

Given $OR = 10$ cm and $OM = 15$ cm.

Diberi $OR = 10$ cm dan $OM = 15$ cm.

[Use /Guna $\pi = 3.142$]

Find

Cari

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

[6 marks/markah]

Answer/Jawapan:

(a)

(b)

- 10 Diagram 10 shows the speed-time graph of a particle for a period of t seconds.
Rajah 10 menunjukkan graf laju-masa bagi suatu zarah dalam tempoh t saat.

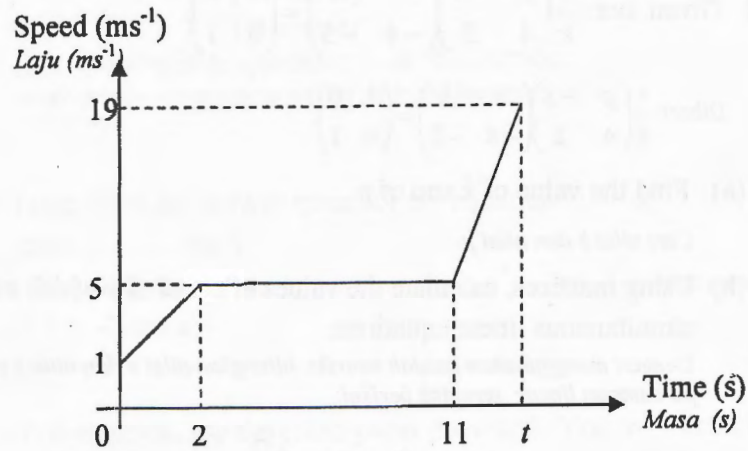


Diagram 10
Rajah 10
length of time

- (a) State the length, in s, that the particle moves with uniform speed.
Nyatakan tempoh masa, dalam s, zarah itu bergerak dengan laju seragam.
- (b) Calculate the rate of change of speed, in ms^{-2} , in the first 2 seconds.
Hitungkan kadar perubahan laju, dalam ms^{-2} , dalam tempoh 2 saat yang pertama.
- (c) Calculate the value of t , if the total distance travelled for the period of t seconds is 87 meter.
Hitungkan nilai t , jika jumlah jarak yang dilalui dalam tempoh t saat itu ialah 87 meter.

[6 marks/ markah]

Answer / Jawapan:

(a)

(b)

(c)

11 Given that $\frac{1}{k} \begin{pmatrix} p & -3 \\ 4 & 2 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ -4 & -5 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$.

Diberi $\frac{1}{k} \begin{pmatrix} p & -3 \\ 4 & 2 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ -4 & -5 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$.

- (a) Find the value of k and of p .

Cari nilai k dan nilai p .

- (b) Using matrices, calculate the values of x and of y which satisfy the following simultaneous linear equations:

Dengan menggunakan kaedah matriks, hitungkan nilai x dan nilai y yang memuaskan persamaan linear serentak berikut:

$$\begin{aligned} 2x + 3y &= 2 \\ -4x - 5y &= -8 \end{aligned}$$

[7 marks /markah]

Answer/Jawapan:

(a)

(b)

Section B
Bahagian B
[48 marks]
[48 markah]

Answer any four questions from this section.
Jawab mana – mana empat soalan daripada bahagian ini.

- 12 (a) Complete Table 12 in the answer space for the equation $y = -x^3 + 2x + 7$ by writing the values of y when $x = -2$ and $x = 1$.

Lengkapkan Jadual 12 di ruang jawapan bagi persamaan $y = -x^3 + 2x + 7$ dengan menulis nilai-nilai y apabila $x = -2$ dan $x = 1$.

[2 marks/markah]

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

Untuk ceraihan soalan in, gunakan kertas graf yang disediakan. Anda boleh menggunakan pembaris fleksibel.

By using a scale of 2cm to 1 unit on the x -axis and 2cm to 5 units on the y -axis, draw the graph of $y = -x^3 + 2x + 7$ for $-2.5 \leq x \leq 3$.

Dengan menggunakan skala 2cm kepada 1 unit pada paksi- x dan 2cm kepada 5 unit pada paksi- y , lukis graf bagi $y = -x^3 + 2x + 7$ bagi $-2.5 \leq x \leq 3$.

[4 marks/markah]

- (c) From your graph, find

Daripada graf anda, cari

- (i) the value of y when $x = -1.8$

nilai y apabila $x = -1.8$

- (ii) the value of x when $y = -11.5$

nilai x apabila $y = -11.5$

[2 marks/markah]

- (d) Draw a suitable straight line on your graph to find all the positive values of x

which satisfy the equation $x^3 - 7x + 3 = 0$ for $-2.5 \leq x \leq 3$.

State these values of x .

Lukis satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai positif x yang

memuaskan persamaan $x^3 - 7x + 3 = 0$ bagi $-2.5 \leq x \leq 3$.

Nyatakan nilai-nilai x tersebut.

[4 marks/markah]

Answer/Jawapan:

(a) $y = -x^3 + 2x + 7$

x	-2.5	-2	-1	0	1	2	2.5	3
y	17.63		6	7		3	-3.63	-14

Table 12
Jadual 12

(b) Refer graph.
Rujuk graf.

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

(ii) $x = \dots\dots\dots$

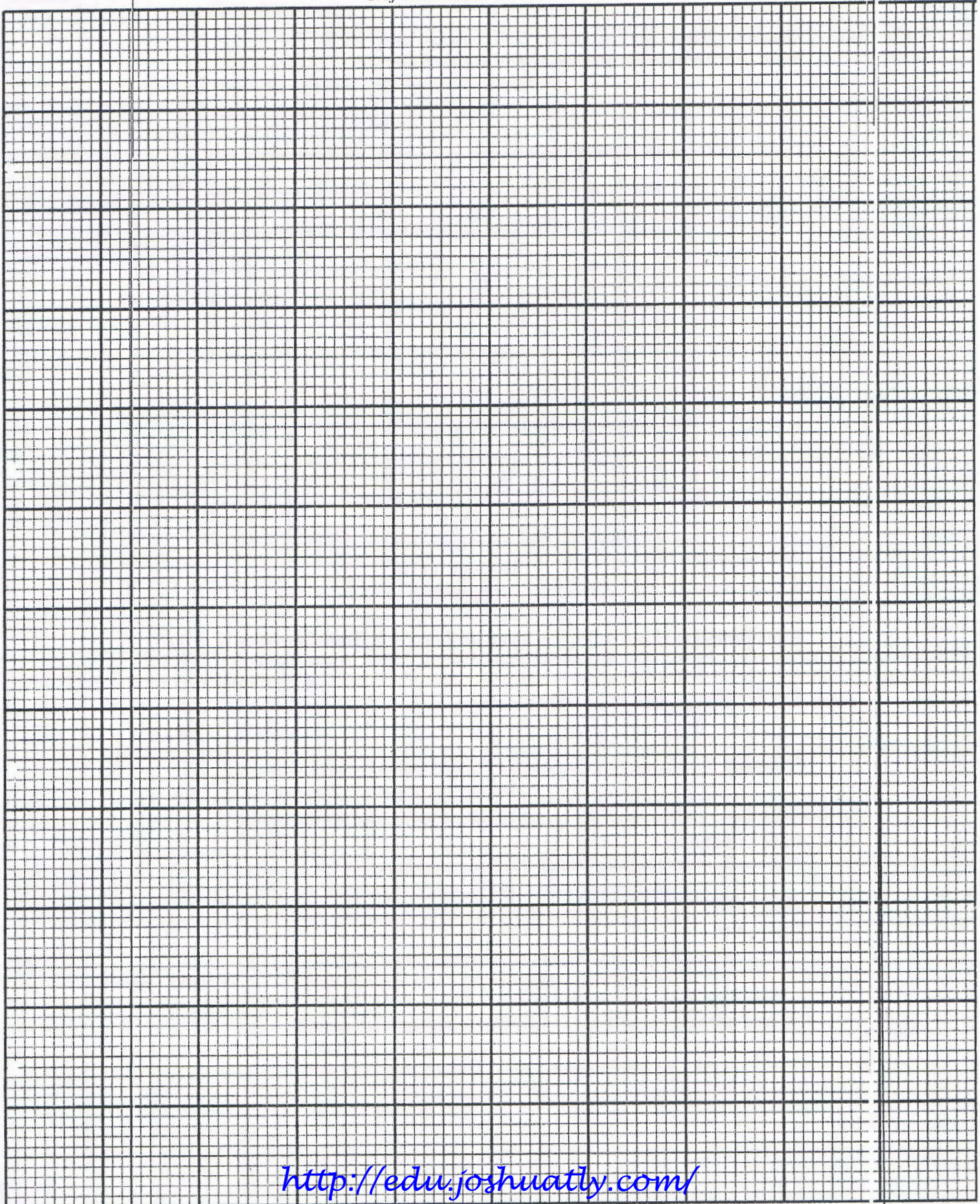
(d) The equation of the straight line:

Persamaan garis lurus

.....

$x = \dots\dots\dots, \dots\dots\dots$

Graph for Question 12
Graf untuk Soalan 12



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- 13 (a) Diagram 13(i) shows coordinates (3,4) on a Cartesian plane.
Rajah 13 (i) menunjukkan koordinat (3,4) di atas satah Cartesian.

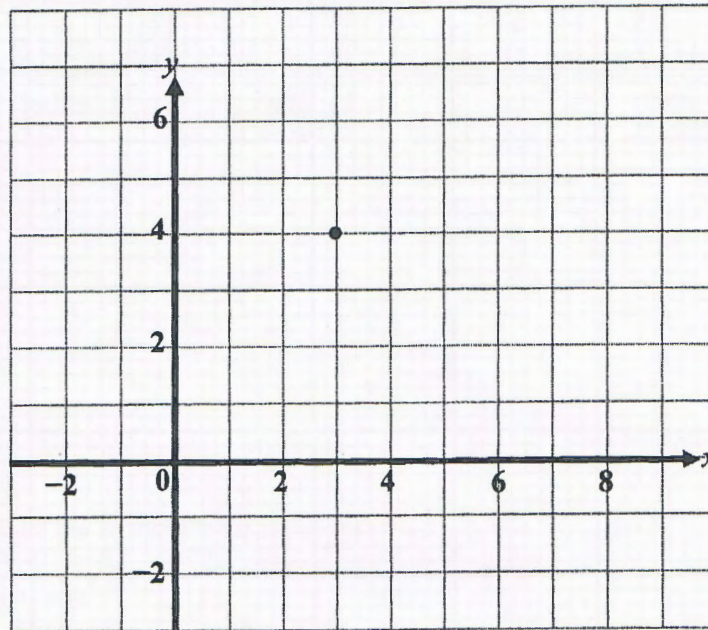


Diagram 13 (i)
Rajah 13(i)

Transformation U is a reflection about the line $x = 2$. Transformation V is the

translation $\begin{pmatrix} 3 \\ -3 \end{pmatrix}$.

Penjelmaan U adalah pantulan pada garis $x = 2$. Penjelmaan V adalah translasi $\begin{pmatrix} 3 \\ -3 \end{pmatrix}$.

State the coordinates of the image of point (3,4) under the following transformations:

Nyatakan koordinat imej bagi titik (3,4) di bawah penjelmaan berikut:

- (i) UV
(ii) VU

[4 marks / markah]

(b) Diagram 13(ii) shows four quadrilateral ABCD, ADEF, GHJK and LPNM drawn on Cartesian plane.

Rajah 13(ii) menunjukkan empat sisi empat ABCD, ADEF, GHJK dan LPNM dilukis atas satah Cartesian

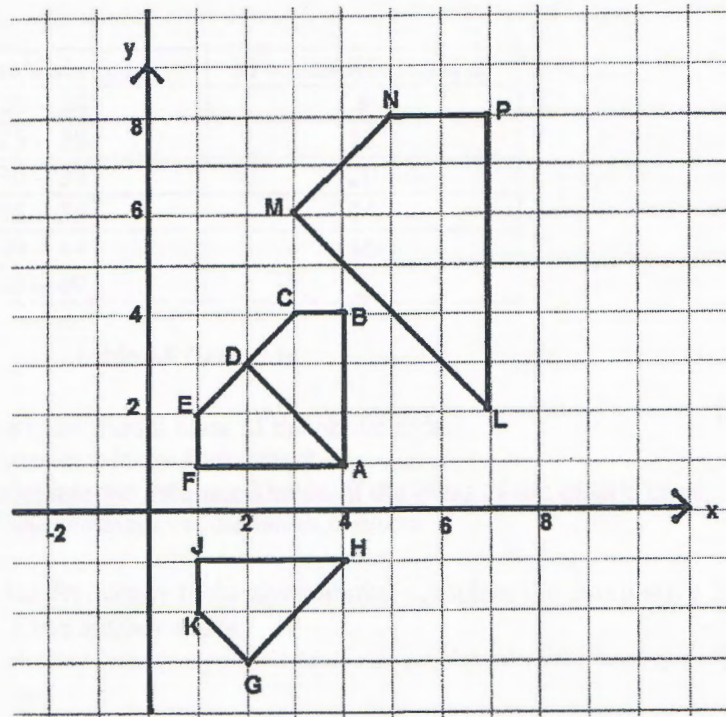


Diagram 13(ii)/ Rajah 13(ii)

ABCD is the image of ADEF under transformation X and GHJK is the image of ABCD under transformation Y.

ABCD ialah imej bagi ADEF di bawah penjelmaan X dan GHJK ialah imej bagi ABCD di bawah penjelmaan Y.

(i) Describe in full the transformation:

Huraikan selengkapnya penjelmaan :

(a) X,

(b) Y.

[5 marks / markah]

(ii) LMNP is the image of ABCD under an enlargement.

LMNP ialah imej bagi ABCD di bawah satu pembesaran.

(a) State the coordinates of the centre of the enlargement.

Nyatakan koordinat bagi pusat pembesaran tersebut.

(b) Given that the area LMNP is 84.6 unit^2 , calculate the area of ABCD.

Diberi luas LMNP ialah 84.6 unit^2 , hitungkan luas bagi ABCD.

[3 marks / markah]

Answer / Jawapan:

(a) (i)

ii)

(b) (i) (a)

(b)

(b) (ii) (a)

(b)

- 14 Table 14 shows the distribution of masses of 70 plastic cups from a factory.
Jadual 14 menunjukkan taburan jisim 70 cawan plastik daripada suatu kilang.

Mass/Jisim (g)	Frequency/ Kekerapan
20 – 24	8
25 – 29	15
30 – 34	20
35 – 39	14
40 – 44	10
45 – 49	3

Table 14 / *Jadual 14*

- (a) (i) State the modal class of the above data.
Nyatakan kelas mod bagi data di atas.
- (ii) Calculate the estimated mean of the mass of the plastic cups.
Hitung min anggaran jisim cawan plastik itu. [4 marks/ *markah*]
- (b) Based on the frequency table given above, complete the cumulative frequency table provided in the answer space.
Berdasarkan jadual kekerapan yang diberi di atas, lengkapkan jadual kekerapan longgokan yang diberi di ruang jawapan. [3 marks/ *markah*]
- (c) Using a scale of 2 cm to 5 g on the x -axis and 2 cm to 10 plastic cups on the y -axis, draw an ogive to represent the above data.
Dengan menggunakan skala 2 cm kepada 5 g pada paksi- x dan 2 cm kepada 10 cawan plastik pada paksi- y , lukis satu ogif untuk mewakili data di atas. [4 marks/ *markah*]
- (d) From your ogive,
Daripada ogif anda,
- (i) if 25% of the plastic cups have a mass of less than y g, find the value of y .
jika 25% daripada cawan plastik mempunyai jisim kurang daripada y g, cari nilai bagi y . [1 mark/ *markah*]

Answer/*Jawapan:*

- (a) (i)
(ii)

(b)

Upper boundary/ <i>Sempadan atas</i>	Cumulative frequency/ <i>Kekerapan longgokan</i>
19.5	0

(c) Refer graph / *Rujuk graf*

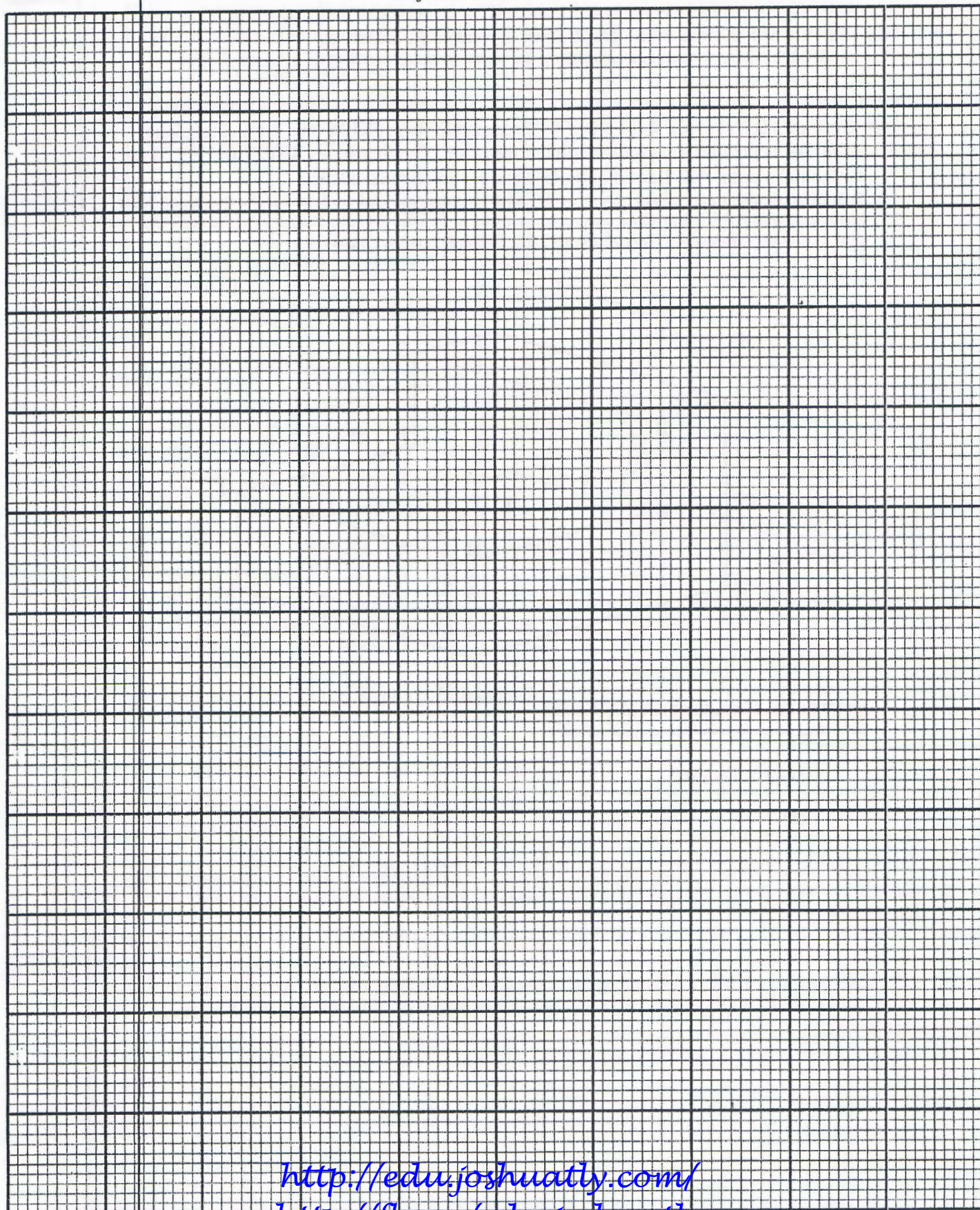
(d) (i)

For
Examiner's
Use

SULIT

1449/2

Graph for Question 14
Graf untuk Soalan 14



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- 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 prism with rectangular base JKLM on a horizontal plane. ADEHJK is the uniform cross-section of the prism. The rectangles ABCD and EFGH are horizontal planes. AK, BL, CF, DE, GM and HJ are vertical edges.,
Rajah 15(i) menunjukkan sebuah pepejal berbentuk prisma dengan tapak berbentuk segi empat tepat JKLM pada satah ufuk. ADEHJK ialah keratan rentas seragam prisma itu. Segi empat tepat ABCD dan EFGH ialah pada satah mengufuk. Tepi AK, BL, CF, DE, GM and HJ adalah tegak.

[3 marks/ markah]

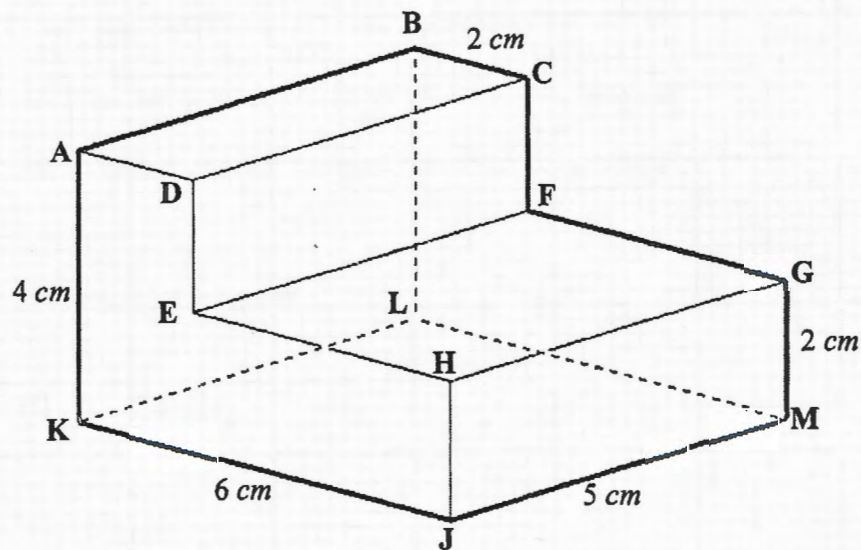


Diagram 15(i) / Rajah 15(i)

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

Answer/Jawapan:

(a)

- (b) A solid prism is joined to the prism in Diagram 15(i) at the vertical plane BCFGML to form a combined solid as shown in Diagram 15(ii). The trapezium MNRS is the uniform cross-section of the prism. TBL, SGM, RN and QP are vertical edges.

Sebuah pepejal berbentuk prisma dicantumkan kepada prisma dalam Rajah 15(i) pada satah mencancang BCFGML untuk membentuk gabungan pepejal seperti yang ditunjukkan dalam Rajah 15(ii). Trapezium MNRS ialah keratan rentas seragam prisma itu. Tepi TBL, SGM, RN dan QP adalah tegak.

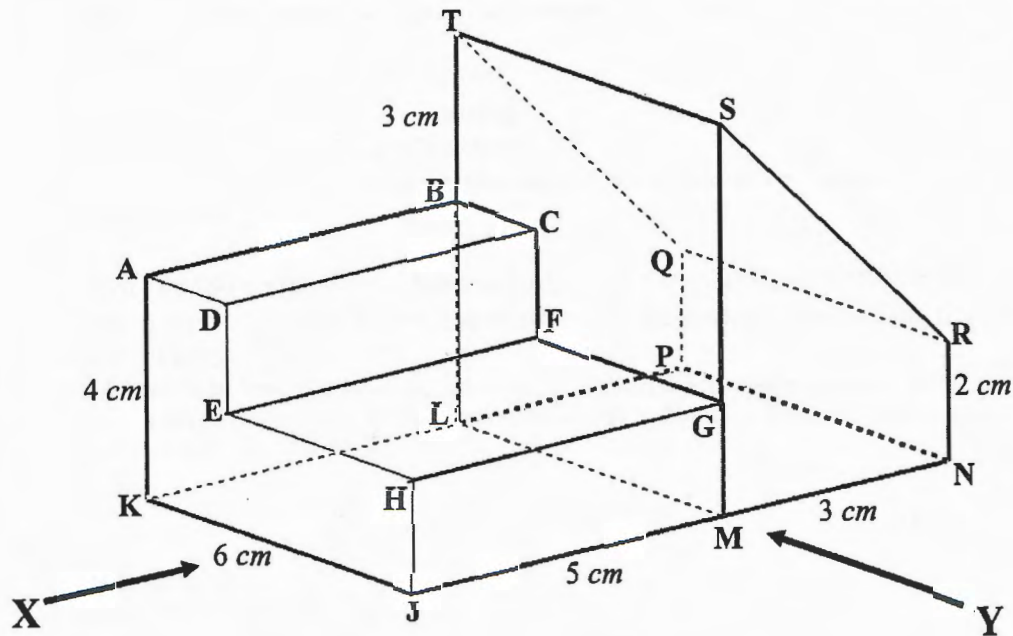


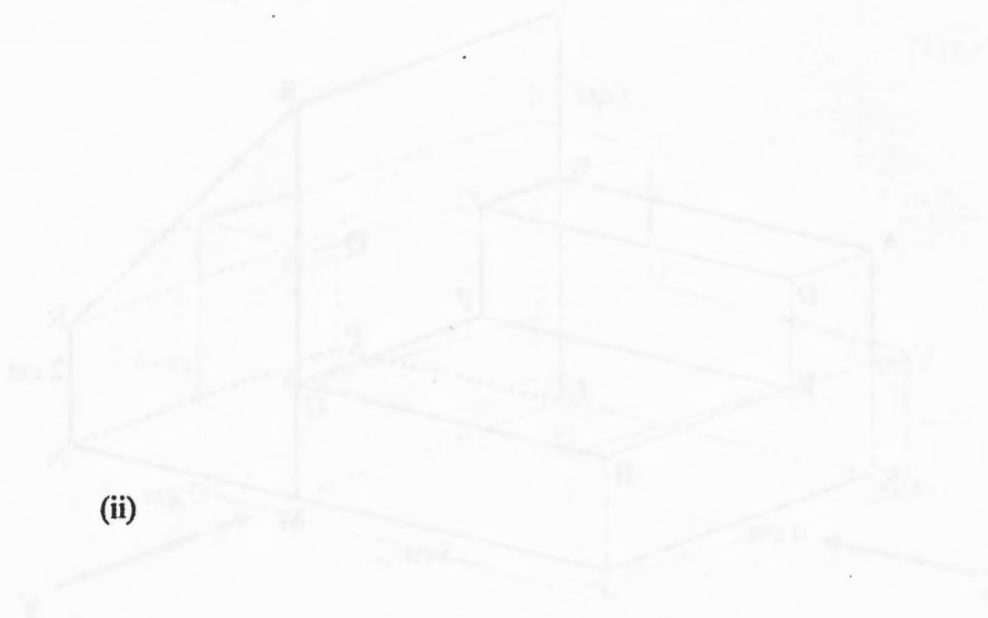
Diagram 15(ii) / Rajah 15(ii)

Draw to full scale,
Lukis dengan skala penuh,

- (i) the elevation of the combined solid on a vertical plane parallel to KJ as viewed from X.
dongakan gabungan pepejal itu pada satah mencancang yang selari dengan KJ sebagaimana yang dilihat dari X.
[5 marks/markah]
- (ii) the elevation of the combined solid on a vertical plane parallel to JMN as viewed from Y.
dongakan gabungan pepejal itu pada satah mencancang yang selari dengan JMN sebagaimana yang dilihat dari Y.
[4 marks/markah]

Answer/Jawapan:

(b) (i)



16 $P(35^{\circ}N, 68^{\circ}E)$, Q , R and T are four points on the surface of the earth. PT is the diameter of the earth and PQ is the diameter of the parallel of latitude $35^{\circ}N$.
 $P(35^{\circ}U, 68^{\circ}T)$, Q , R dan T adalah empat titik di atas permukaan bumi. PT adalah diameter bagi bumi dan PQ adalah diameter selarian latitud $35^{\circ}U$.

- (a) State the location of T .
Nyatakan kedudukan bagi T . [2 marks / markah]
- (b) Calculate the distance, in nautical mile, from P due west to Q measured along the common parallel of latitude.
Hitung jarak, dalam batu nautika, dari P dari arah barat ke Q diukur sepanjang selarian latitud sepunya. [3 marks / markah]
- (c) Calculate the shortest distance, in nautical mile, from T to the South Pole measured along the surface of the earth.
Hitung jarak terpendek, dalam batu nautika, dari T ke Kutub Selatan yang diukur sepanjang permukaan bumi. [2 marks / markah]
- (d) Point R is 3480 nautical mile due south of Q . An aeroplane took off from P and flew due west to Q , then it flew due south to R . The average speed of the flight was 820 knots.
Titik R ialah 3480 batu nautika arah selatan dari Q . Sebuah kapal terbang berlepas dari P ke arah barat ke Q , kemudian terbang arah ke selatan ke R . Purata laju seluruh penerbangan kapal terbang itu 820 knot.

Calculate

Hitung

- (i) the latitude of R
latitud bagi R
- (ii) the total time, in hours, taken for the whole flight.
jumlah masa, dalam jam, yang diambil bagi seluruh penerbangan itu.

[5 marks / markah]

Answer / Jawapan :

(a)

(b)

(c)

(d) (i)

(ii)

END OF QUESTION PAPER
KERTAS SOALAN TAMAT



**JABATAN PELAJARAN NEGERI
WILAYAH PERSEKUTUAN**

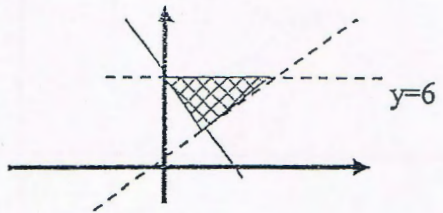
**PEPERIKSAAN PERCUBAAN SPM
TINGKATAN 5
2012**

MATEMATIK

Kertas 2
1449/2

SKEMA PEMARKAHAN

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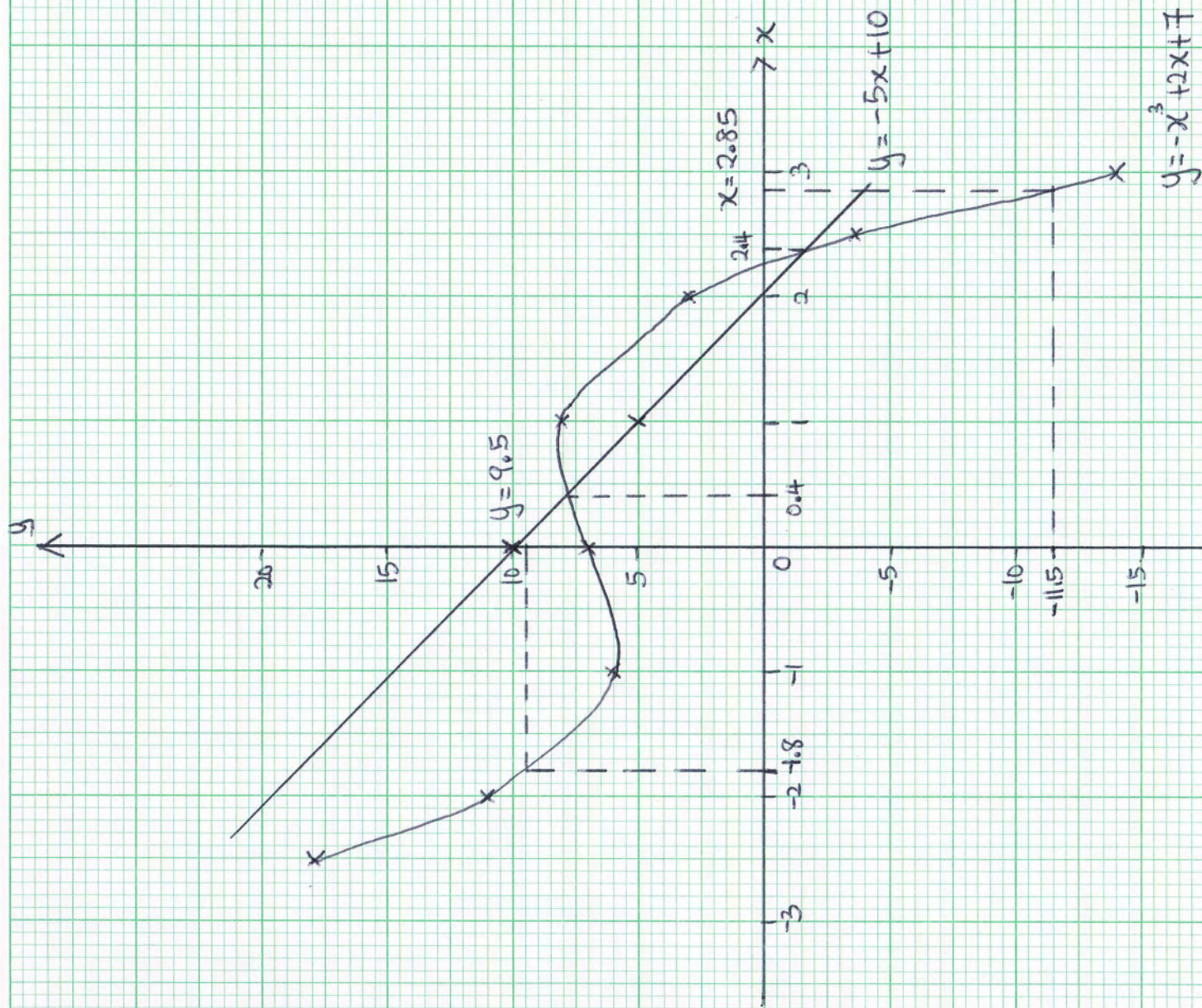
No.	SCHEME (SECTION A : 52 marks)	Marks	
1	 <p style="text-align: right;">Line $y=6$ drawn. Shaded region</p> <p><u>Notes:</u> 1. Region satisfies two inequalities give 1 mark. 2. If $y=6$ is a solid line give 1 mark for the correct shaded region.</p>	1	
2	$\angle MTU$ or $\angle UTM$ $\tan \angle ADE = \frac{5}{8}$ 32°	1	
3	$10u - 4v = 32$ or $5u + 20v = -50$ or equivalent $11u = 22$ or $-22v = 66$ <u>OR</u> $\begin{pmatrix} u \\ v \end{pmatrix} = \frac{1}{5(4) - (-2)(1)} \begin{pmatrix} 4 & 2 \\ -1 & 5 \end{pmatrix} \begin{pmatrix} 16 \\ -10 \end{pmatrix}$ or equivalent (2 marks) $u = 2$ $v = -3$ <u>Note :</u> Accept $\begin{pmatrix} u \\ v \end{pmatrix} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ as final answer, award 1 mark	1 1	
4	$2x^2 - 5x - 12 = 0$ $(2x+3)(x-4) = 0$ $x = -\frac{3}{2}, 4$ <u>Note :</u> 1. Accept without '= 0'. Accept three terms on the same side, in any order for the general form.	1 1 1,1	
5	$6 \times 4 \times 5$ $\frac{1}{4} \times \frac{22}{7} \times 3^2 \times 4$	1 1	

	$6 \times 4 \times 5 - \frac{1}{4} \times \frac{22}{7} \times 3^2 \times 4$ $\frac{642}{7} \text{ or } 91\frac{5}{7} \text{ or } 91.71$	1	
		1	4
6(a)(i)	Somé	1	
(ii)	All	1	
(b)	If $x + 2 = 5$ then $x = 3$	1	
	If $x = 3$ then $x + 2 = 5$	1	
(c)	$6 \times 6 \times 6$	1	
	216	1	6
7(a)	$m = -3$ $-3 = -3(9) + c$ $y = -3x + 24$	1	
		1	
(b)	$0 = -3x + 24$ $x\text{-intercept} = 8$	1	
		1	5
8	<div style="display: flex; align-items: center;"> <div style="border: 1px solid red; border-radius: 50%; padding: 5px; margin-right: 20px;"> $1 - \frac{1}{3} - \frac{1}{4}$ $\frac{5}{12}$ </div> <div style="flex-grow: 1;"> </div> <div style="margin-left: 20px;"> <p>(a) $(\frac{1}{3})(\frac{4}{5})$ $= \frac{4}{15}$</p> <p>(b) $(\frac{1}{3})(\frac{1}{5}) +$ $(\frac{1}{4})(\frac{2}{5}) +$ $(\frac{5}{12})(\frac{3}{8})$ $= \frac{31}{96}$</p> </div> </div>	1	
		1	
		1	
		1	5
9	$\frac{1}{2} \times 3.142 \times (15)^2 \text{ or } \frac{30}{360} \times 3.142 \times (10)^2$	1	
(a)	$\frac{1}{2} \times 3.142 \times (15)^2 - \frac{30}{360} \times 3.142 \times (10)^2$ <p>327.29</p>	1	
		1	
(b)	$\frac{180}{360} \times 2 \times 3.142 \times 15 \text{ or } \frac{60}{360} \times 2 \times 3.142 \times 10$	1	
	$\frac{180}{360} \times 2 \times 3.142 \times 15 + \frac{60}{360} \times 2 \times 3.142 \times 10 + 15 + 5 + 10$ <p>87.6</p>	1	
		1	6
10(a)	9	1	

(b)	$\frac{5-1}{2-0}$	1	6
(c)	$\frac{1}{2} \times (1+5) \times 2 + (9 \times 5) + \frac{1}{2}(5+19)(t-11) = 87$ $t = 14$	2 1	
11	$k = 2$ $p = -5$ $\begin{pmatrix} 2 & 3 \\ -4 & -5 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ -8 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{2(-5) - (3)(-4)} \begin{pmatrix} -5 & -3 \\ 4 & 2 \end{pmatrix} \begin{pmatrix} 2 \\ -8 \end{pmatrix}$ $x = 7, y = -4$ <u>Note :</u> Accept $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 7 \\ -4 \end{pmatrix}$ as final answer, award 1 mark	1,1 1 1 1,1	6
Total marks of section A			52

No	SECTION B (48 marks)	Marks	
12(a)	11,8		
(b)	<u>Graph (refer to the graph)</u> Axes drawn in correct direction, uniform scales in $-2.5 \leq x \leq 3$ and $-14 \leq y < 18$ 6 points and *2 points correctly plotted or curve passes through these points for $-2.5 \leq x \leq 3$. Smooth and continuous curve without any straight line passing through all 8 points using the given scales for $-2.5 \leq x \leq 3$ and $-14 \leq y < 18$ Note: 6 or 7 points correctly plotted, award 1 mark	1,1 1 2 1	12
(c)(i)	9.5 ± 0.1	1	
(ii)	2.9 ± 0.1	1	
(d)	Straight line $y = -5x + 10$ drawn correctly Note: No straight line drawn or wrongly drawn, give 1 mark for the correct straight line equation $y = -5x + 10$. $x = 0.4 \pm 0.1, 2.4 \pm 0.1$	2 1,1	

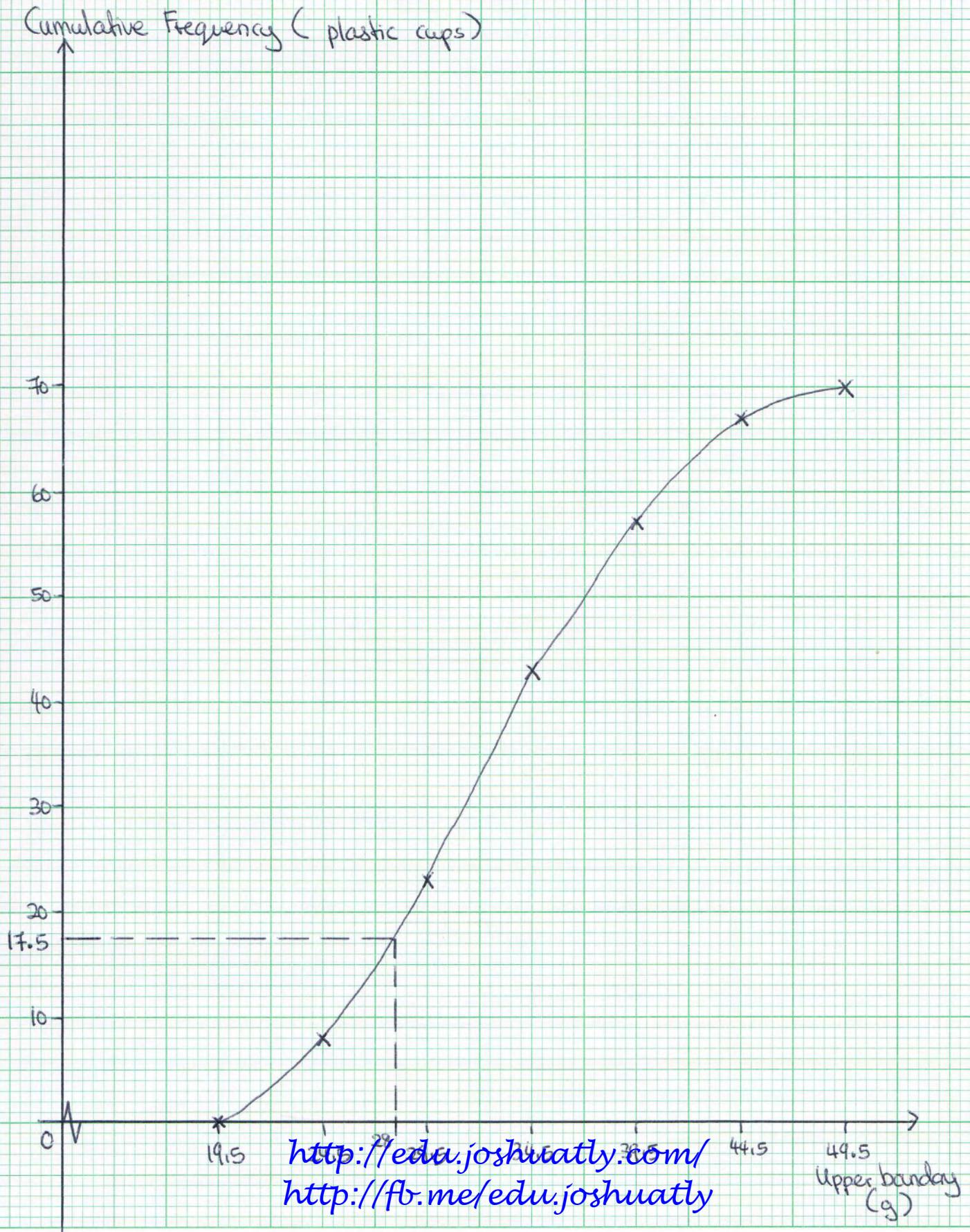
Question (12)



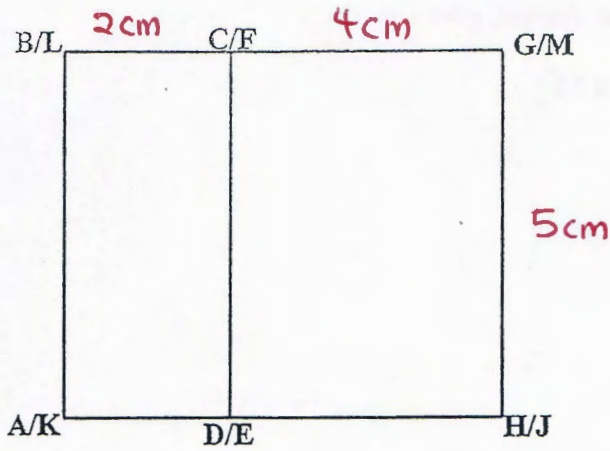
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<http://fb.me/edu.joshuatly>

13a(i)	$(-2, 1)$ Note: $(6, 1)$ award 1m	2																	
(ii)	$(4, 1)$ Note: $(1, 4)$ award 1m	2																	
(bi)(a)	X = reflection at line AD	2																	
(b)	Y = Rotation anticlockwise 90° at centre $(5, 0)$	3																	
	Note: 1. Reflection only, give 1 mark 2. Rotation anticlockwise 90° , give 2 marks 3. Rotation and centre $(5, 0)$, give 2 marks. 4. Rotation only, give 1 mark.																		
(bii)																			
(a)	$(1, 0)$	1																	
(b)	$\frac{1}{4} \times 84.6$	1																	
	21.15 unit ²	1	12																
14																			
(a)(i)	30 – 34	1																	
(ii)	$\frac{8(22)+15(27)+20(32)+14(37)+10(42)+3(47)}{8+15+20+14+10+3}$ or $\frac{2300}{70}$	2																	
	32.86 / $32\frac{6}{7}$	1																	
(b)	<table border="1"> <thead> <tr> <th>Upper boundary/ <i>Sempadan atas</i></th> <th>Cumulative frequency/ <i>Kekerapan longgokan</i></th> </tr> </thead> <tbody> <tr><td>19.5</td><td>0</td></tr> <tr><td>24.5</td><td>8</td></tr> <tr><td>29.5</td><td>23</td></tr> <tr><td>34.5</td><td>43</td></tr> <tr><td>39.5</td><td>57</td></tr> <tr><td>44.5</td><td>67</td></tr> <tr><td>49.5</td><td>70</td></tr> </tbody> </table> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> All correct in column I All correct in column II (5 or 6 cumulative frequency correct, award 1 mark) </div>	Upper boundary/ <i>Sempadan atas</i>	Cumulative frequency/ <i>Kekerapan longgokan</i>	19.5	0	24.5	8	29.5	23	34.5	43	39.5	57	44.5	67	49.5	70	1 2	
Upper boundary/ <i>Sempadan atas</i>	Cumulative frequency/ <i>Kekerapan longgokan</i>																		
19.5	0																		
24.5	8																		
29.5	23																		
34.5	43																		
39.5	57																		
44.5	67																		
49.5	70																		
(c)	Graph (refer to the graph) Axes drawn in correct direction, uniform scales in $19.5 \leq x \leq 49.5$ and $0 \leq y \leq 70$ 7* points correctly plotted Smooth and continuous curve without any straight line through all 7 points using the given scales for $19.5 \leq x \leq 49.5$. Note: 5* or 6* points correctly plotted, award 1 mark	1 2 1																	
(d)	28	1	12																

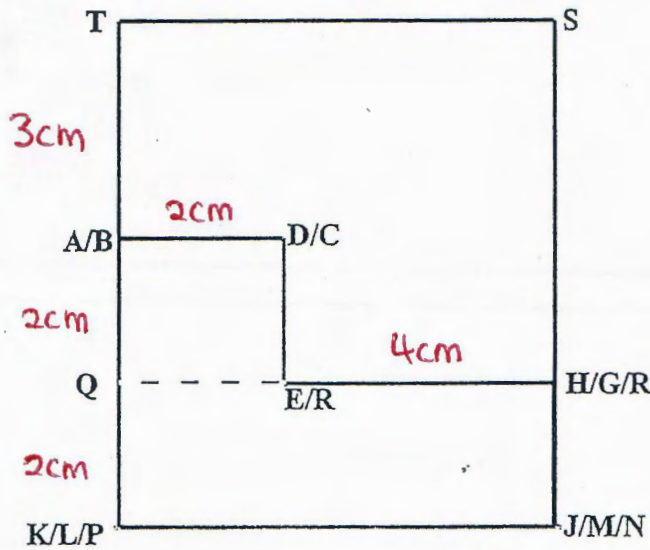
Question (14)



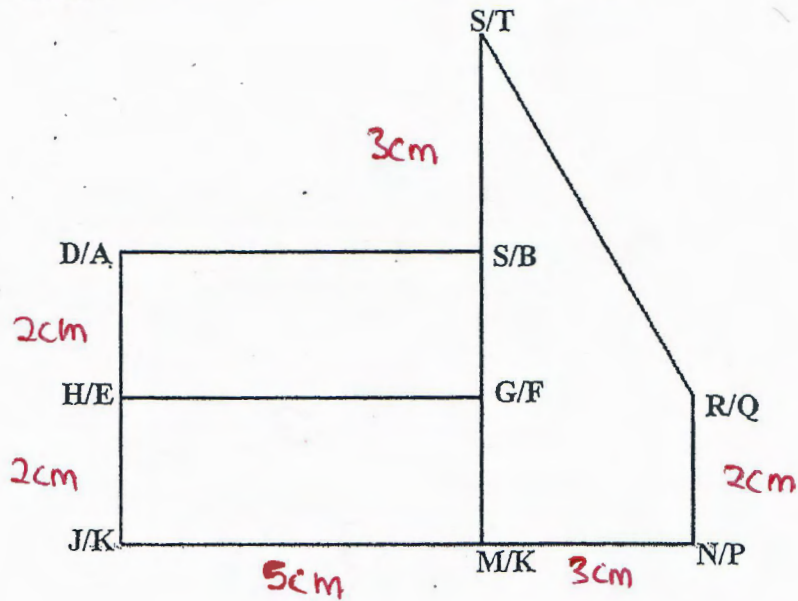
15a)



(b)(i)



(b)
(ii)



16				
(a)	$(35^\circ \text{ S}, 112^\circ \text{ W})$ Note : 35° S or 112° W correct, give 1 mark		2	
(b)	$(68^\circ + 112^\circ) \times 60^\circ \times \cos 35^\circ$ 8846.84		2 1	
(c)	$(90^\circ - 35^\circ) \times 60^\circ$ 3360		1 1	
(d) (i)	$\frac{3480}{60}$ or 58° 23° S		1 1	
(ii)	$\frac{8846.84 + 3480}{820}$ 15		2 1	12
				100

JPNWP
PEPERIKSAAN PERCUBAAN SPM TAHUN 2012
MATHEMATICS PAPER 2

SUMMARY : TEST SPECIFICATION TABLE

Question	Topics	Knowledge	Understanding	Application	Analysis	Synthesis	Evaluation	Level	Marks
1	Inequalities	X						L	3
2	Lines & Planes in 3D			X				I	3
3	Simultaneous Linear Eq			X				I	4
4	Quadratic Equation			X				I	4
5	Volume			X				I	4
6	Mathematical reasoning	X		X				L	5
7	Straight line			X				I	5
8	Probability	X						H	5
9	Area & Perimeter			X				H	6
10	Gradient & area under a graph			X				H	6
11	Matrices			X				I	7
12	Graph Functions			X				I	12
13	Transformation			X				I	12
14	Statistics			X				I	12
15	Plan and Elevations			X				I	12
16	Earth as sphere			X				I	12
	Frequency	3	0	14	0	0	0	Total	100
	Percentage	18%	0%	82%	0%	0%	0%		
		18%		82%		0%			

Level of Difficulty	Frequency
(H) High	3
(I) Intermediate	11
(L) Low	2