SULIT
1449/1
Mathematics
Kertas 1
2011
$1\frac{1}{4}$ jam

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI SEMBILAN

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2011

MATHEMATICS

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa.*

2. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*

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

Kertas soalan ini mengandungi 32 halaman bercetak.

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

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

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

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

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

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

Min $= \frac{\textit{hasil tambah nilai data}}{\textit{bilangan data}}$

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

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

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

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

12. $P(A') = 1 - P(A)$

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

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

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

SHAPE AND SPACE
BENTUK DAN RUANG

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

   Luas trapezium = $\frac{1}{2}\times$ *hasil tambah dua sisi selari* $\times$ *tinggi*

2. Circumference of circle $= \pi d = 2\pi r$
   Lilitan bulatan $= \pi d = 2\pi j$

3. Area of circle $= \pi r^2$
   Luas bulatan $= \pi j^2$

4. Curved surface area of cylinder $= 2\pi rh$
   Luas permukaan melengkung silinder $= 2\pi jt$

5. Surface area of sphere $= 4\pi r^2$
   Luas permukaan sfera $= 4\pi j^2$

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 $= \pi j^2 t$

8. Volume of cone $= \frac{1}{3}\pi r^2 h$

   Isipadu kon $= \frac{1}{3}\pi j^2 t$

9. Volume of sphere $= \frac{4}{3}\pi r^3$

   Isipadu sfera $= \frac{4}{3}\pi j^3$

10. Volume of right pyramid $= \frac{1}{3}\times$ base area $\times$ height

    Isipadu piramid tegak $= \frac{1}{3}\times$ *luas tapak* $\times$ *tinggi*

11. Sum of interior angles of a polygon
    Hasil tambah sudut pedalaman poligon
    $= (n - 2) \times 180°$

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

$\dfrac{\textit{panjang lengkok}}{\textit{lilitan bulatan}} = \dfrac{\textit{sudut pusat}}{360^0}$

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

$\dfrac{\textit{luas sektor}}{\textit{luas bulatan}} = \dfrac{\textit{sudut pusat}}{360^0}$

14. Scale factor, $k = \dfrac{PA'}{PA}$

Faktor skala, $k = \dfrac{PA'}{PA}$

15. Area of image $= k^2 \times$ area of object

Luas imej $= k^2 \times$ *luas objek*

Answer **all** questions
*Jawab **semua** soalan*

1 Round off 0.04703 correct to three significant figures.
Bundarkan 0.04703 *betul kepada tiga angka bererti.*

A 0.05
B 0.050
C 0.047
D 0.0470

2 Express 5.231×10^{2} as a single number.
Ungkapkan 5.231×10^{2} *sebagai satu nombor tunggal.*

A 0.05231
B 0.5231
C 52.31
D 523.1

3 $2.74\times10^{-5}-3.21\times10^{-6}=$

A 2.419×10^{-5}
B 2.419×10^{-6}
C 3.036×10^{-5}
D 3.036×10^{-6}

4 $11011_2 - 111_2 =$

A 10000_2
B 10100_2
C 11100_2
D 100010_2

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5 Express 441_5 as a number in base eight.

Ungkapkan 441_5 *sebagai nombor dalam asas lapan.*

A 170_8

B 171_8

C 176_8

D 671_8

6 In Diagram 1, *PQRS* is a rhombus. *PST* and *SRU* are straight lines.

Dalam Rajah 1, PQRS ialah sebuah rombus. PST dan SRU adalah garis lurus.

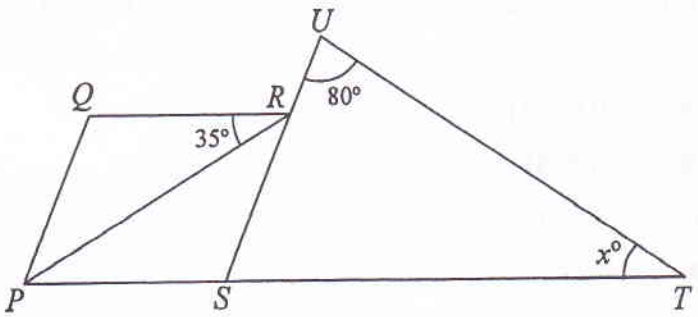


Diagram 1
Rajah 1

Find the value of *x*.

Cari nilai x.

A 30

B 45

C 70

D 80

7 In Diagram 2, *JKLMN* is a regular pentagon. *JKR* and *JLS* are straight lines.

Dalam Rajah 2, JKLMN ialah sebuah pentagon sekata. JKR dan JLS adalah garis lurus.

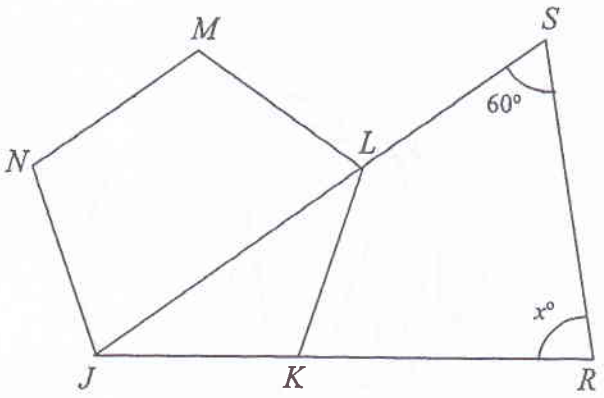


Diagram 2
Rajah 2

Find the value of x.

Cari nilai x.

A 48

B 72

C 84

D 96

8 In Diagram 3, *JKL* is a tangent to the circle with centre *O*, at *K*.

Dalam Rajah 3, JKL ialah tangen kepada bulatan berpusat O, di K.

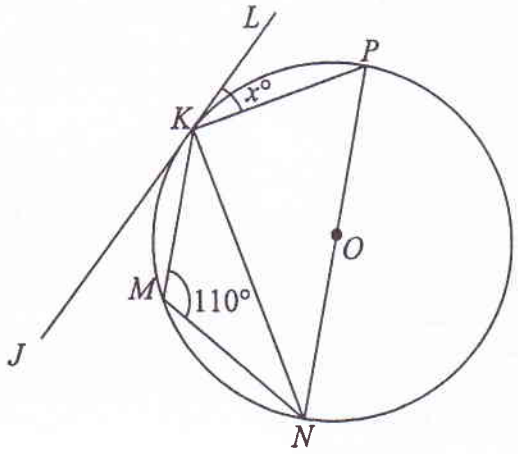


Diagram 3

Rajah 3

Find the value of *x*.

Cari nilai x.

A 20

B 35

C 55

D 70

9 In Diagram 4, triangle Q is the image of triangle P under a rotation of 90° clockwise.

Dalam Rajah 4, segi tiga Q adalah imej bagi segi tiga P di bawah suatu putaran 90° ikut arah jam.

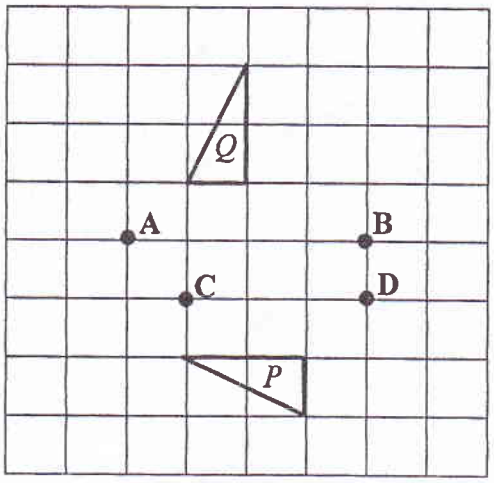


Diagram 4

Rajah 4

Which of the points **A**, **B**, **C** or **D** is the centre of the rotation ?

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

10 Diagram 5 shows five quadrilaterals drawn on square grids.

Rajah 5 menunjukkan lima sisi empat dilukis pada grid segi empat sama.

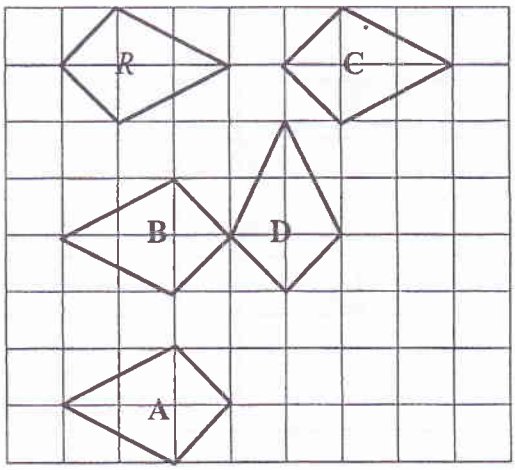


Diagram 5
Rajah 5

Which of the quadrilaterals **A**, **B**, **C** or **D**, is an image of *R* under a reflection in a certain line ?

Antara sisi empat **A**, **B**, **C** *atau* **D**, *yang manakah imej bagi R di bawah suatu pantulan pada garis tertentu?*

11 In Diagram 6, *JKL* is a straight line.

Dalam Rajah 6 , JKL ialah garis lurus.

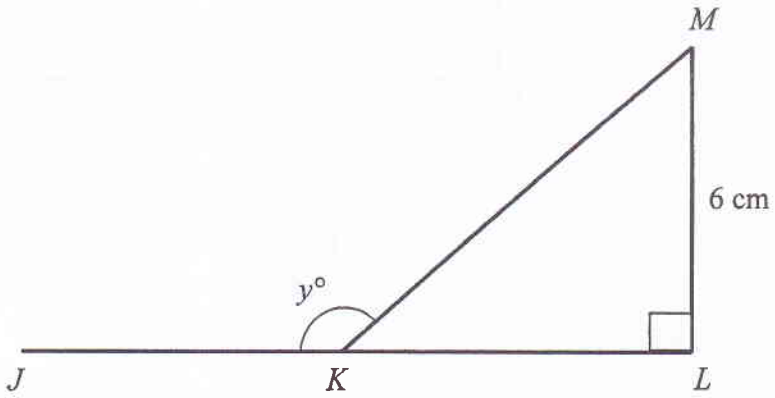


Diagram 6

Rajah 6

Given that $\cos \angle LMK = \frac{3}{5}$, find the value of $\cos y°$.

Diberi bahawa $kos \angle LMK = \frac{3}{5}$, *cari nilai kos* $y°$.

A $\frac{3}{5}$

B $\frac{4}{5}$

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

D $-\frac{4}{5}$

12 Diagram 7 shows the graph of $y = \cos x°$.
Rajah 7 menunjukkan graf $y = kos\, x°$.

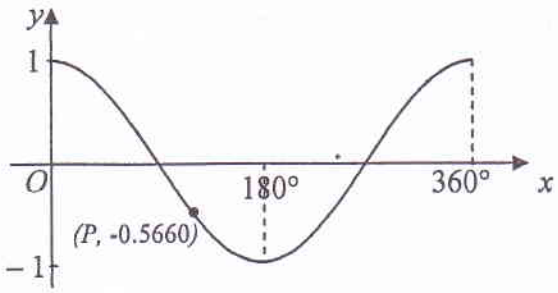


Diagram 7
Rajah 7

Find the value of P.
Cari nilai P.

A 34.47°

B 55.53°

C 124.47°

D 145.53°

13 Diagram 8 shows a unit circle. O is the origin of a Cartesian plane.

Rajah 8 menunjukkan sebuah bulatan unit. O ialah asalan pada suatu satah Cartesan.

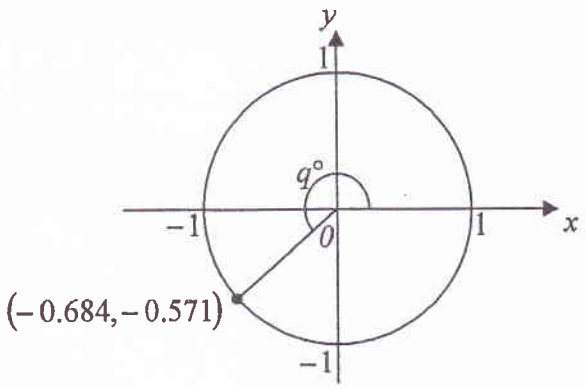


Diagram 8
Rajah 8

Find the value of q.
Cari nilai q.

A 230.15

B 223.15

C 219.85

D 214.35

14 Diagram 9 shows a right angled triangular prism with a rectangular base *JKLM*.

Rajah 9 menunjukkan sebuah prisma segitiga tegak dengan tapak segi empat tepat JKLM.

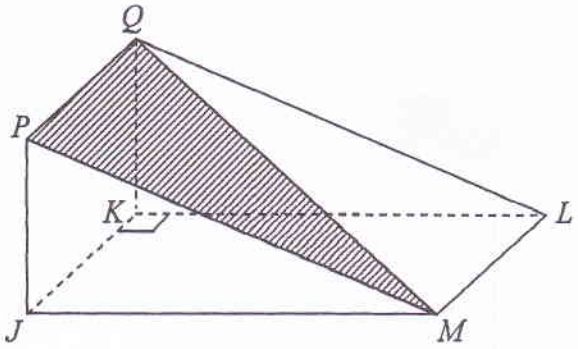


Diagram 9

Rajah 9

Name the angle between the plane *PQM* and the plane *JKQP*.

Namakan sudut di antara satah PQM dan satah JKQP.

A $\angle MQK$

B $\angle MPJ$

C $\angle PMJ$

D $\angle QML$

15 In Diagram 10, P and Q are two points on the horizontal plane and R is the top of a vertical flagpole PR.

Dalam Rajah 10, P dan Q ialah dua titik pada satah mengufuk dan R ialah puncak sebatang tiang bendera tegak PR.

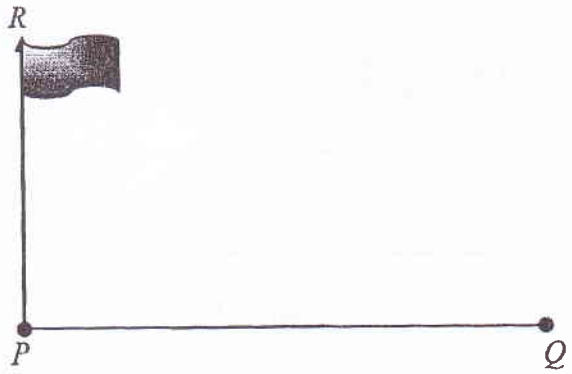


Diagram 10

Rajah 10

The angle of elevation of R from Q is 42°. The distance between P and Q is 16 m. Calculate the height, in m, of the flagpole PR.

Sudut dongakan R dari Q ialah 42°. Jarak di antara P dan Q ialah 16 m. Hitungkan tinggi, dalam m, tiang bendera PR itu.

A 10.71

B 11.89

C 14.41

D 17.77

16 Diagram 11 shows two vertical tower *KL* and *JM* on a horizontal plane.

Rajah 11 menunjukkan dua buah menara KL dan JM di atas satah mengufuk.

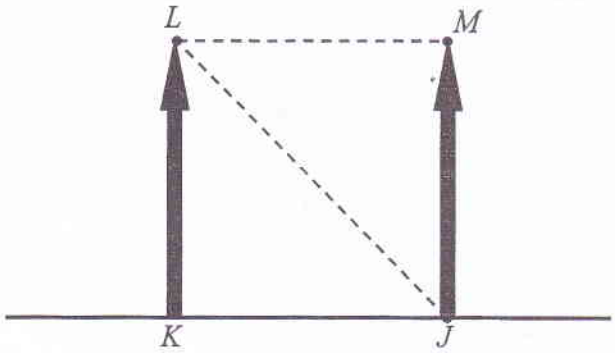


Diagram 11

Rajah 11

The angle of depression of point *J* from point *L* is

Sudut tunduk titik J dari titik L ialah

A $\angle MLJ$

B $\angle LJK$

C $\angle JKL$

D $\angle JLK$

17 Diagram 12 shows two points of P and Q on a horizontal plane.

Rajah 12 menunjukkan dua titik P dan Q pada satah mengufuk.

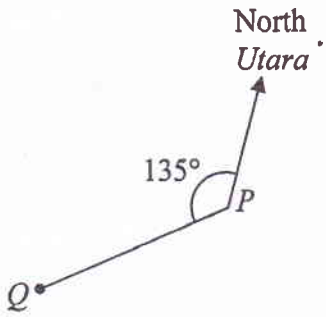


Diagram 12
Rajah 12

Find the bearing of P from Q.

Cari bearing P dari Q.

A 315°

B 225°

C 135°

D 045°

18 In Diagram 13, N is the North Pole and S is the South Pole. $PM=MS$.

Dalam Rajah 13, U ialah Kutub Utara dan S ialah Kutub Selatan. PM=MS.

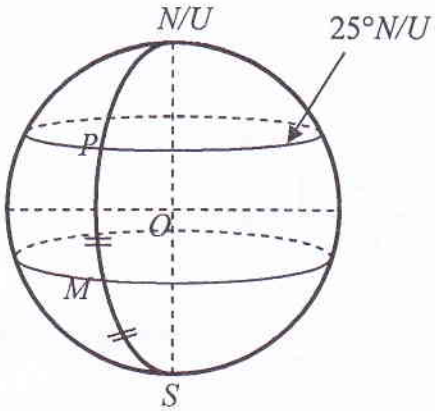


Diagram 13

Rajah 13

Find the latitude of M.

Cari latitud M.

A 25°S

B 32.5°S

C 45°S

D 57.5°S

19 $3p(p+1)-(p-2)^2 =$

19 $3p(p+1)-(p-2)^2 =$

A $2p^2-p+4$

B $2p^2-p-4$

C $2p^2+3p+4$

D $2p^2+7p-4$

20 Express $\frac{m}{3}-\frac{2(m^2-2)}{12m}$ as a single fraction in its simplest form.

Ungkapkan $\frac{m}{3}-\frac{2(m^2-2)}{12m}$ *sebagai satu pecahan tunggal dalam bentuk termudah.*

A $\frac{m^2+2}{6m}$

B $\frac{m^2-2}{6m}$

C $\frac{m^2+2}{12m}$

D $\frac{m^2-2}{12m}$

21 Given that $p=\frac{1}{p}+\frac{p}{q}$, express q in terms of p.

Diberi bahawa $p=\frac{1}{p}+\frac{p}{q}$, *ungkapkan q dalam sebutan p.*

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

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

C $\frac{1}{p^2}$

D $\frac{1}{p^2-1}$

22 Given that $m+\frac{2}{3}(12m+18)=-3$, calculate the value of m.

Diberi bahawa $m+\frac{2}{3}(12m+18)=-3$, *hitungkan nilai* m.

A $-\frac{27}{25}$

B $-\frac{9}{5}$

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

D $-\frac{7}{3}$

23 Given that $3^{2y}=\frac{27}{3^y}$, find the value of y.

Diberi bahawa $3^{2y}=\frac{27}{3^y}$, *cari nilai* y.

A 3

B 1

C $\frac{1}{2}$

D $\frac{1}{3}$

24 Simplify :

Ringkaskan:

$$\left(m^{\frac{1}{3}}n^2\right)^3 \div \left(m^2n^{-4}\right) =$$

A $m^{-1}n^2$

B $m^{-1}n^{10}$

C mn^{10}

D m^2n

25 List all the integers x which satisfy both the simultaneous linear inequalities

$\frac{3}{5}x - 2 \geq 1$ and $15 - x > 2$.

Senaraikan semua integer x yang memuaskan kedua-dua ketaksamaan linear serentak $\frac{3}{5}x - 2 \geq 1$ *dan* $15 - x > 2$.

A 5, 6, 7, 8, 9, 10

B 6, 7, 8, 9, 10

C 5, 6, 7, 8, 9, 10, 11, 12

D 6, 7, 8, 9, 10, 11, 12

26 Which number lines represents the solution of the linear inequalities $4 < 3x - 5 \leq 13$?

Garis nombor manakah yang mewakili penyelesaian bagi ketaksamaan linear serentak $4 < 3x - 5 \leq 13$?

A

B

C

D

27 A bar chart in Diagram 14 shows a number of students attended the leadership course representing by four schools *P*, *Q*, *R* and *S*.

Carta palang dalam Rajah 14 menunjukkan bilangan murid yang menghadiri suatu kursus kepimpinan yang diwakili oleh empat buah sekolah P, Q, R dan S.

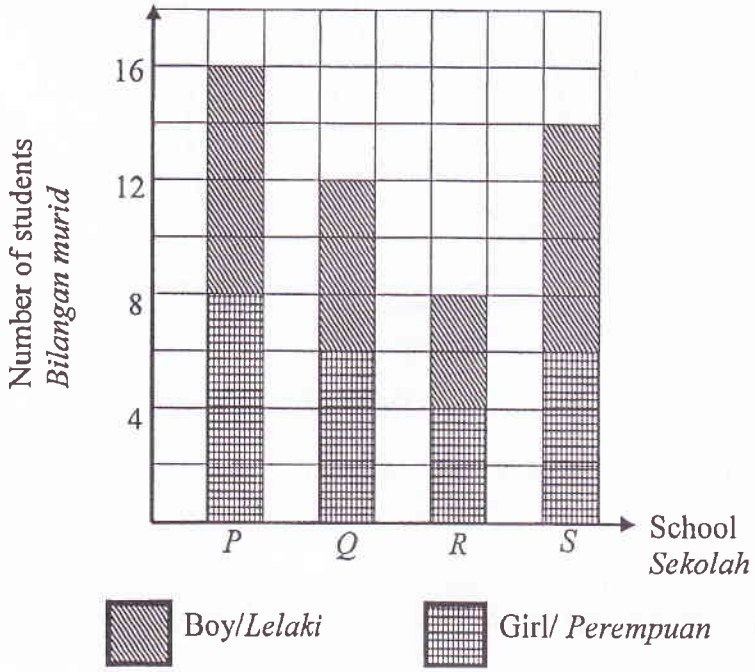


Diagram 14

Rajah 14

Calculate the different between number of boys and girls who attended the leadership course.

Hitungkan beza antara bilangan murid lelaki dengan murid perempuan yang menghadiri kursus kepimpinan itu.

A 4

B 3

C 2

D 1

28 The pie chart in Diagram 15 shows the favourite games of a group of students.

Carta pai dalam Rajah 15 menunjukkan permainan yang diminati oleh sekumpulan murid.

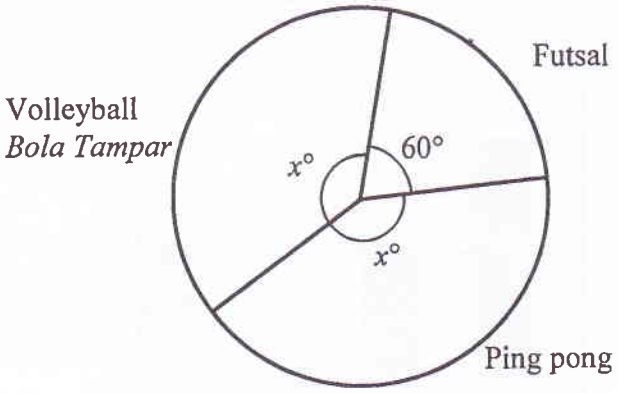


Diagram 15
Rajah 15

If the total number of students in the group is 108. How many students who decided the volleyball as their favourite game?

Jika jumlah bilangan murid dalam kumpulan itu ialah 108 *orang. Berapakah bilangan murid yang memilih bola tampar sebagai permainan yang diminati?*

A 18

B 45

C 90

D 150

29 Table 1 is a frequency table showing the marks obtained by a group of student in a Mathematics test.

Jadual 1 ialah jadual kekerapan yang menunjukkan markah diperolehi oleh sekumpulan murid dalam satu ujian Matematik.

Marks/ *Markah*	Frequency /*Kekerapan*
80-100	6
70-79	9
60-69	10
50-59	6
<50	5

Table 1
Jadual 1

Calculate the number of students that gets mark below than the modal class.

Hitung bilangan murid mendapat markah yang lebih rendah daripada kelas mod.

A 6

B 10

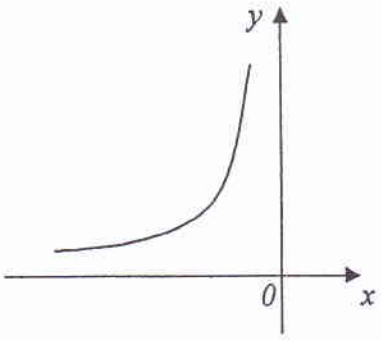
C 15

D 21

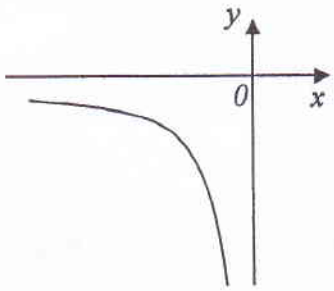
30 Which graph represents part of the graph $y = -\frac{5}{x}$?

Graf manakah yang mewakili sebahagian daripada graf $y = -\frac{5}{x}$?

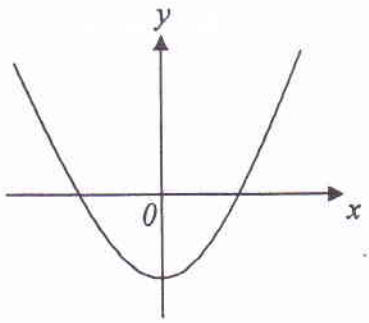
A



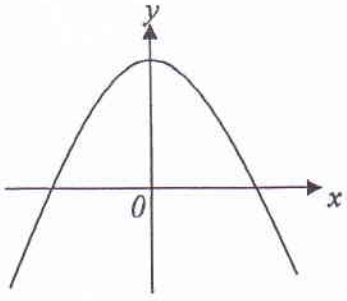
B



C



D



31 Given the universal set $\xi = \{ x : 20 < x \leq 34, x \text{ is an integer} \}$, and set $P = \{ x : x$ is a number such that the sum of its two digits is an odd number $\}$. Find set P'.

Diberi set semesta $\xi = \{ x : 20 < x \leq 34, x$ *ialah integer* $\}$ *dan set* $P = \{ x : x$ *ialah nombor dengan keadaan hasil tambah dua digitnya ialah nombor ganjil* $\}$. *Cari set* P'.

A { 22, 24, 26, 28, 31, 33 }

B { 22, 24, 26, 30, 32, 34 }

C { 23, 25, 27, 29, 31, 32, 34}

D { 23, 25, 27, 29, 30, 31, 32, 34 }

32 Diagram 16 is a Venn diagram showing the universal set ξ = { Form Five students}, set M = { Students who passed Mathematics test } and set S = { Students who passed Science test }.

Rajah 16 ialah gambar rajah Venn yang menunjukkan set semesta, ξ = *{ Murid Tingkatan Lima }, set M= { Murid yang lulus ujian Matematik } dan set S = { Murid yang lulus ujian Sains }.*

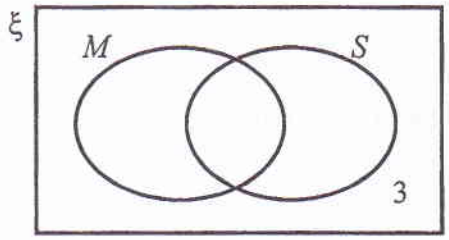


Diagram 16
Rajah 16

Given $n(\xi) = 100$, $n(M) = 45$ and $n(S) = 72$. Find the number of students who passed both of Mathematics and Science test.

Diberi $n(\xi) = 100$, $n(M) = 45$ *dan* $n(S) = 72$. *Cari bilangan murid yang lulus kedua-dua ujian Matematik dan Sains.*

A 14

B 17

C 20

D 27

33 In Diagram 17, gradient of straight line $PQ = \frac{4}{5}$.

Dalam Rajah 17, kecerunan garis lurus $PQ = \frac{4}{5}$.

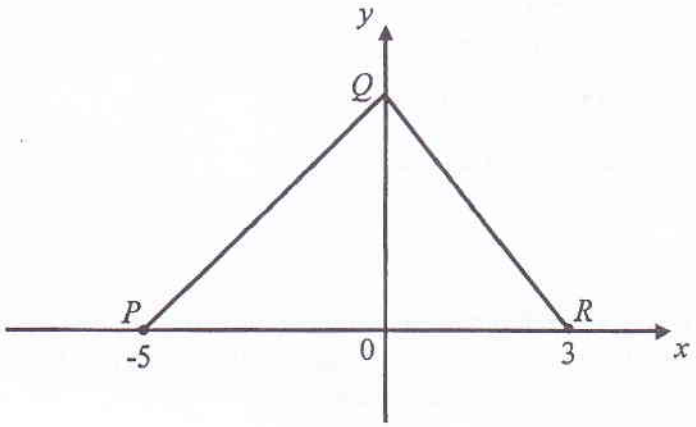


Diagram 17

Rajah 17

Find the gradient of straight line QR.

Cari kecerunan bagi garis lurus QR.

A $\frac{3}{4}$

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

C $\frac{4}{3}$

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

34 Diagram 18 shows the straight line PQ is parallel to the straight line RS.

Rajah 18 menunjukkan garis lurus PQ adalah selari dengan garis lurus RS.

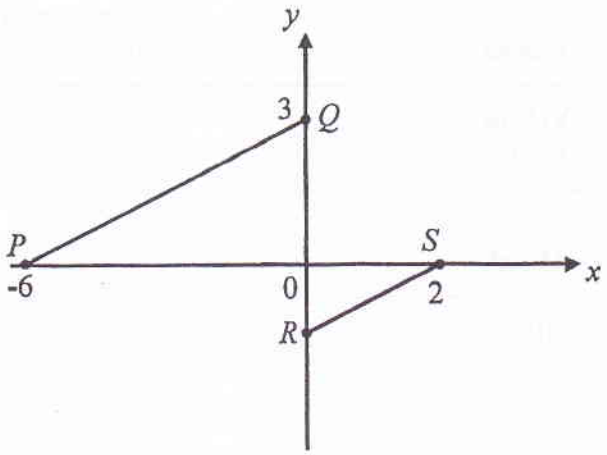


Diagram 18

Rajah 18

Find the y-intercept of RS.

Cari pintasan-y bagi RS.

A -2

B -1

C 1

D 2

35 Table 2 shows the number of marbles in a box.

Jadual 2 menunjukkan bilangan guli dalam sebuah kotak.

Colour *Warna*	Number of marbles *Bilangan guli*
Yellow *Kuning*	24
Red *Merah*	31
Blue *Biru*	x

Table 2
Jadual 2

A marble is picked at random from the box. The probability that a yellow marble is chosen is $\frac{3}{10}$. Find the value of x.

Sebiji guli dipilih secara rawak daripada kotak itu. Kebarangkalian memilih guli kuning ialah $\frac{3}{10}$. *Cari nilai x itu.*

A 24

B 25

C 26

D 28

36 In a class, there were eight students who wear spectacles.
If a student was chosen at random from the class, the probability that the student was wearing spectacles was $\frac{1}{5}$.
Six new students joined the class.
If a student is chosen from the class, state the probability that the student who wears spectacles.

Dalam sebuah kelas, terdapat lapan orang murid memakai cermin mata.
Jika murid dipilih secara rawak daripada kelas itu , kebarangkalian murid memakai cermin mata ialah $\frac{1}{5}$.
Enam orang murid baru menyertai kelas itu.
Jika seorang murid dipilih secara rawak daripada kelas itu, nyatakan kebarangkalian murid yang memakai cermin mata.

A $\frac{3}{23}$

B $\frac{3}{20}$

C $\frac{7}{23}$

D $\frac{7}{20}$

37 It is given that y varies directly as the cube root of x.
Find the relationship between y and x.

Diberi bahawa y berubah secara langsung dengan punca kuasa tiga x.
Cari hubungan antara y dan x.

A $y \propto x^{1/3}$

B $y \propto x^3$

C $y \propto \frac{1}{x^{1/3}}$

D $y \propto \frac{1}{x^3}$

38 Table 3 shows the values of m,n and p. Given that $m \propto \frac{\sqrt{n}}{p^2}$.

Jadual 3 menunjukkan nilai-nilai m,n dan p. Diberi bahawa $m \propto \frac{\sqrt{n}}{p^2}$.

m	n	p
18	9	2
4	q	3

Table 3

Jadual 3

Find the value of q.

Cari nilai q.

A $\frac{1}{4}$

B $\frac{2}{3}$

C $\frac{3}{2}$

D $\frac{9}{4}$

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

A $\begin{pmatrix} 13 & -6 \\ 6 & 5 \end{pmatrix}$

B $\begin{pmatrix} 13 & -6 \\ -6 & 5 \end{pmatrix}$

C $\begin{pmatrix} 13 & 6 \\ 6 & 5 \end{pmatrix}$

D $\begin{pmatrix} 13 & 6 \\ -6 & 5 \end{pmatrix}$

40 Given that $\begin{pmatrix} 1 & 3 \\ 0 & h \end{pmatrix}\begin{pmatrix} h \\ 3 \end{pmatrix} = \begin{pmatrix} 6 \\ -9 \end{pmatrix}$, calculate the value of h.

Diberi bahawa $\begin{pmatrix} 1 & 3 \\ 0 & h \end{pmatrix}\begin{pmatrix} h \\ 3 \end{pmatrix} = \begin{pmatrix} 6 \\ -9 \end{pmatrix}$, *hitung nilai h.*

A 6

B 3

C 0

D -3

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of 40 questions.

   Kertas soalan ini mengandungi 40 soalan.

2. Answer **all** questions.

   Jawab **semua** *soalan.*

3. Answer each question by blackening the correct space on the answer sheet.

   Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.

4. Blacken only **one** space for each question.

   Bagi setiap soalan hitamkan **satu** *ruangan sahaja.*

5. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.

   Sekiranya anda hendak menukarkan 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 dilukiskan mengikut skala kecuali dinyatakan.

7. A list of formulae is provided on pages 2 to 4.

   Satu senarai rumus disediakan di halaman 2 hingga 4.

8. A booklet of four-figure mathematical tables can be used.

   Buku sifir matematik empat angka boleh digunakan.

9. You may use a non-programmable scientific calculator.

   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

NAMA : _____ TINGKATAN : _____

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI SEMBILAN

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2011

MATHEMATICS

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 Melayu*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Pemeriksa			
Bahagian	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			

Kertas soalan ini mengandungi 36 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. $a^m \times a^n = a^{m+n}$

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

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

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

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

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

Min = $\frac{hasil\ tambah\ nilai\ data}{bilangan\ data}$

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

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

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

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

12. $P(A') = 1 - P(A)$

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

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

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

[Lihat halaman sebelah

SHAPE AND SPACE
BENTUK DAN RUANG

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

   Luas trapezium = $\frac{1}{2}\times$ *hasil tambah dua sisi selari* $\times$ *tinggi*

2. Circumference of circle $= \pi d = 2\pi r$
   Lilitan bulatan $= \pi d = 2\pi j$

3. Area of circle $= \pi r^2$
   Luas bulatan $= \pi j^2$

4. Curved surface area of cylinder $= 2\pi rh$
   Luas permukaan melengkung silinder $= 2\pi jt$

5. Surface area of sphere $= 4\pi r^2$
   Luas permukaan sfera $= 4\pi j^2$

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 $= \pi j^2 t$

8. Volume of cone $= \frac{1}{3}\pi r^2 h$

   Isipadu kon $= \frac{1}{3}\pi j^2 t$

9. Volume of sphere $= \frac{4}{3}\pi r^3$

   Isipadu sfera $= \frac{4}{3}\pi j^3$

10. Volume of right pyramid $= \frac{1}{3}\times$ base area $\times$ height

    Isipadu piramid tegak $= \frac{1}{3}\times$ *luas tapak* $\times$ *tinggi*

11. Sum of interior angles of a polygon
    Hasil tambah sudut pedalaman poligon
    $= (n - 2) \times 180°$

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

$\dfrac{\textit{panjang lengkok}}{\textit{lilitan bulatan}} = \dfrac{\textit{sudut pusat}}{360^\circ}$

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

$\dfrac{\textit{luas sektor}}{\textit{luas bulatan}} = \dfrac{\textit{sudut pusat}}{360^0}$

14. Scale factor, $k = \dfrac{PA'}{PA}$

Faktor skala, $k = \dfrac{PA'}{PA}$

15. Area of image $= k^2 \times$ area of object

Luas imej $= k^2 \times$ *luas objek*

For Examiner's Use

Section A
Bahagian A

[52 marks]
[52 *markah*]

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

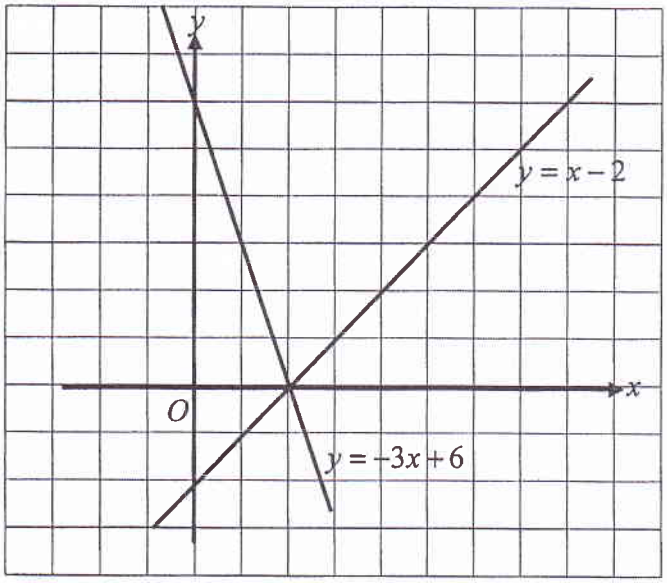
1 On the graph in the answer space, shade the region which satisfies the three inequalities $y \geq x-2$, $y \geq -3x+6$, and $y < 6$.

[3 *marks*]

Pada graf di ruang jawapan, lorek rantau yang memuaskan ketiga-tiga ketaksamaan $y \geq x-2$, $y \geq -3x+6$, *dan* $y < 6$.

[3 *markah*]

Answer/*Jawapan*:



For Examiner's Use

2 Diagram 2 shows a right pyramid with the horizontal square base *PQRS*.

Rajah 2 menunjukkan sebuah piramid tegak dengan tapak mengufuk segi empat sama PQRS.

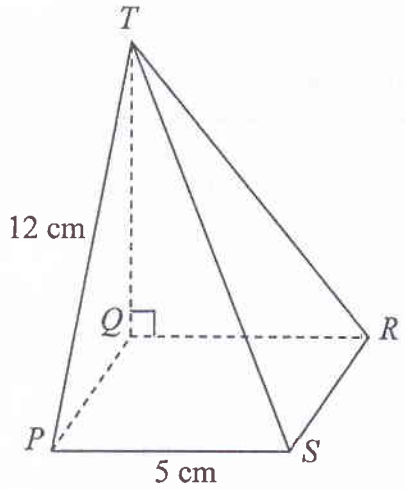


Diagram 2
Rajah 2

(a) Name the angle between the line *ST* and the plane *PQT*,

Namakan sudut di antara garis ST dengan satah PQT,

(b) Calculate the angle between the line *ST* and the plane *PQT*,

Hitungkan sudut di antara garis ST dengan satah PQT,

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

Answer/ Jawapan:

(a)

(b)

3 Solve the following quadratic equation :

Selesaikan persamaan kuadratik berikut:

$$\frac{3x^2 - 5x}{2} = x + 3$$

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

For Examiner's Use

Answer/ Jawapan:

4 Calculate the value of x and of y that satisfy the following simultaneous linear equations:

Hitung nilai x dan nilai y yang memuaskan persamaan linear serentak berikut:

$$\frac{1}{3}x + 2y = -1$$
$$x - 3y = 6$$

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

Answer/ Jawapan:

For Examiner's Use

5 Diagram 5 shows a composite solid formed by the combination of a right prism and a half circular cylinder. Trapezium *PQRS* is the uniform cross-section of the prism.

Rajah 5 menunjukkan sebuah gabungan pepejal yang dibentuk daripada cantuman sebuah prisma tegak dan sebuah separuh silinder. Trapezium PQRS ialah keratan rentas seragam prisma itu.

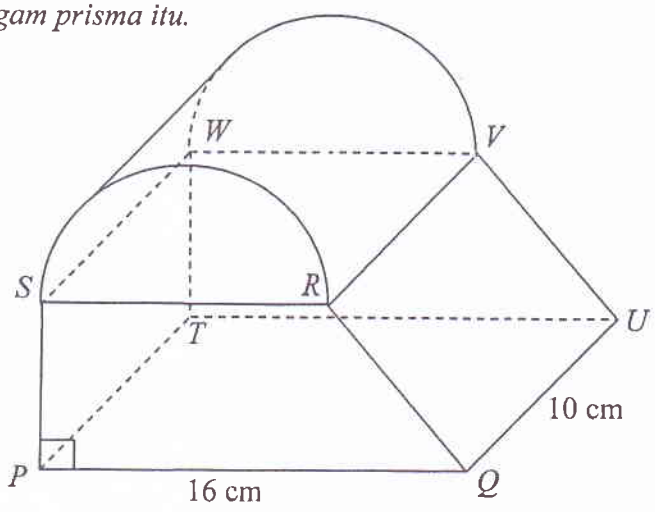


Diagram 5
Rajah 5

The diameter of the half circular cylinder is 14 cm and the volume of the composite solid is 1970 cm^3.

Diameter separuh silinder itu ialah 14 cm dan isipadu gabungan pepejal itu ialah 1970 cm^3.

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

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

(a) the volume, in cm^3, of the half circular cylinder.

isipadu, dalam cm^3, *separuh silinder.*

(b) the height, in cm, of *PS*.

tinggi, dalam cm, *PS.*

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

Answer / *Jawapan*:

For Examiner's Use

(a)

(b)

For Examiner's Use

6 (a) Complete the following statement using the quantifier "all" or "some", to make it a **true** statement.

Lengkapkan setiap pernyataan berikut dengan pengkuantiti "semua" atau "sebilangan", supaya menjadi suatu pernyataan ***benar.***

.....factors of 4 are factors of 10
.....*faktor bagi 4 adalah faktor bagi 10*

(b) Complete the Premise 2 in the following argument:

Lengkapkan Premis 2 dalam hujah berikut:

Premise 1: All prime number are divisible by itself and 1.

Premis 1: Semua nombor perdana boleh dibahagi tepat dengan dirinya dan 1.

Premise 2/ *Premis 2*: .....

Conclusion : 7 is divisible by itself and 1.

Kesimpulan : 7 *boleh dibahagi tepat dengan dirinya dan* 1.

(c) Make a general conclusion by induction for the sequence of numbers 2, 7, 24,... which follows the following pattern.

Buat satu kesimpulan umum secara aruhan bagi urutan nombor 2, 7, 24,... *yang mengikut pola berikut.*

$$2 = 3^1 - 1$$
$$7 = 3^2 - 2$$
$$24 = 3^3 - 3$$
$$..... = ...$$

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

Answer / *Jawapan*:

(a).....

(b) Premise 2/ *Premis* 2: .....

(c) .....

7 Diagram 7 shows a trapezium *OSTU* drawn on a Cartesian plane.

Rajah 7 menunjukkan trapezium OSTU yang dilukis pada satah Cartesan.

For Examiner's Use

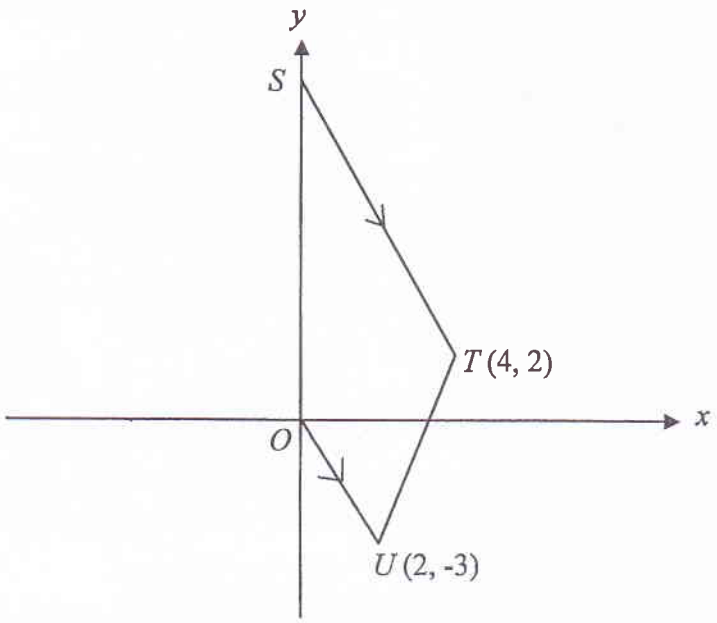


Diagram 7
Rajah 7

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

Find

Cari

(a) the equation of the straight line *ST*,

persamaan garis lurus ST,

(b) the *x*-intercept of the straight line *ST*.

pintasan-x bagi garis lurus ST.

Answer / *Jawapan*:

(a)

(b)

For Examiner's Use

8 Diagram 8 shows four numbered cards in box *P* and three cards labelled with letters in box *Q*.

Rajah 8 menunjukkan empat kad nombor di dalam kotak P dan tiga kad yang berlabel dengan huruf di dalam kotak Q.

Box *P*
Kotak P

Box *Q*
Kotak Q

Diagram 8
Rajah 8

A card is picked at random from box *P* and then a card is picked at random from box *Q*

Sekeping kad diambil 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 peristiwa yang mungkin, cari kebarangkalian

(a) a card with a prime number and the card labelled with vowel are picked

satu kad nombor perdana dan kad berlabel vokal dipilih

(b) a card with a number which is multiple of 2 or the card labelled consonant are picked.

satu kad nombor gandaan 2 atau kad berlabel konsonan dipilih.

[5 marks]
[5 *markah*]

For Examiner's Use

Answer / *Jawapan*:

(a)

(b)

For Examiner's Use

9 In Diagram 9, OPQ is a sector of a circle with centre P and $OPRS$ is a semicircle with centre O. SOP is a straight line.

Dalam Rajah 9, OPQ ialah sektor bulatan berpusat P dan OPRS ialah semibulatan berpusat O. SOP ialah garis lurus.

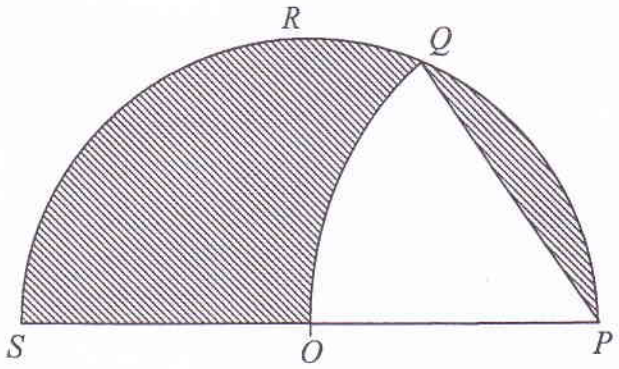


Diagram 9
Rajah 9

It is given that $OP = 14$ cm and $\angle OPQ = 60°$.

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

Diberi bahawa $OP = 14$ cm *dan* $\angle OPQ = 60°$.

Guna $\pi = \frac{22}{7}$, *hitungkan*

(a) the perimeter, in cm, of the shaded region,

perimeter, dalam cm, *kawasan yang berlorek,*

(b) the area, in cm^2, of the shaded region.

luas, dalam cm^2, *kawasan yang berlorek.*

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

Answer / *Jawapan*:

For Examiner's Use

(a)

(b)

For Examiner's Use

10 Diagram 10 shows the speed-time graph for the movement of a particle for a period of 13 s.

Rajah 10 *menunjukkan graf laju-masa bagi pergerakan suatu zarah bagi tempoh* 13 s.

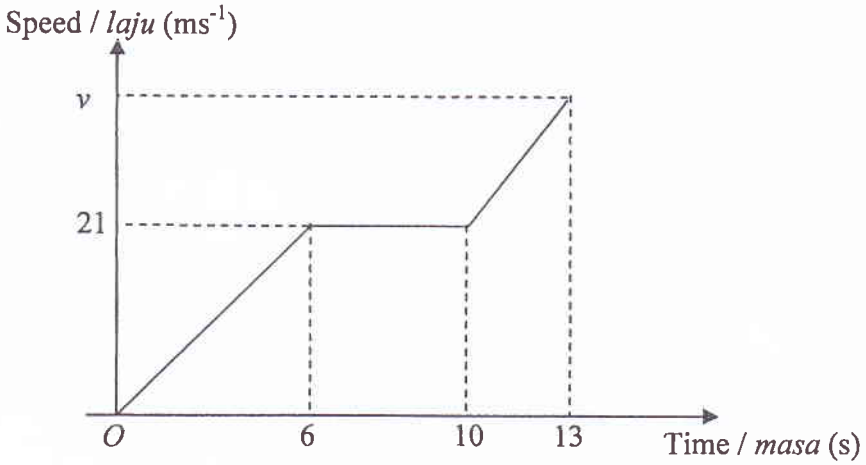


Diagram 10
Rajah 10

(a) State the uniform speed, in ms^{-1}, of the particle.

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

(b) Calculate the rate of change of speed, in ms^{-2}, of the particle in the first 6 s.

Hitungkan kadar perubahan laju, dalam ms^{-2}, *bagi zarah itu dalam* 6 s *pertama.*

(c) Calculate the value of *v*, if the total distance travel in 13 s is 223.5 m.

Hitungkan nilai v, jika jumlah jarak yang dilalui dalam 13 s *ialah* 223.5 m.

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

[Lihat halaman sebelah

Answer / *Jawapan*:

For Examiner's Use

(a)

(b)

(c)

For Examiner's Use

11 Given that the matrix equation $\frac{1}{k}\begin{pmatrix}-2 & 4\\ m & 3\end{pmatrix}\begin{pmatrix}3 & -4\\ 1 & -2\end{pmatrix}=\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$

Diberi bahawa persamaan matriks $\frac{1}{k}\begin{pmatrix}-2 & 4\\ m & 3\end{pmatrix}\begin{pmatrix}3 & -4\\ 1 & -2\end{pmatrix}=\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$

(a) Find the value of m and of k.

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:

$$3x-4y=13$$
$$x-2y=6$$

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

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

[7 marks]
[7 *markah*]

Answer / *Jawapan*:

(a)

(b)

For Examiner's Uses

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 1 in the answer space for the equation $y = -x^3 + 4x + 5$ by writing the values of y when $x = -3$ and $x = 4$. [2 *marks*]

Lengkapkan Jadual 1 *di ruang jawapan bagi persamaan* $y = -x^3 + 4x + 5$ *dengan menulis nilai-nilai y apabila* $x = -3$ *dan* $x = 4$. [2 *markah*]

(b) For this part of the question, use the graph paper provided on page 21.
You may use a flexible curve rule.

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan pada halaman 21.
Anda boleh menggunakan pembaris fleksibel.

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

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

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

(c) From your graph, find

Daripada graf anda, cari

(i) the value of y when $x = 3.5$

nilai y apabila $x = 3.5$

(ii) the value of x when $y = 15$

nilai x apabila $y = 15$

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

(d) Draw a suitable straight line on your graph to find all values of x which satisfy the equation $x^3 = 14x + 10$ for $-4 \le x \le 4$.
State these values of x. [4 *marks*]

Lukis satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai x yang memuaskan persamaan $x^3 = 14x + 10$ *untuk* $-4 \le x \le 4$.
Nyatakan nilai-nilai x itu. [4 *markah*]

For Examiner's Use

Answer/Jawapan:

(a)

x	−4	−3	−2	−1	0	1	2	3	4
y	53		5	2	5	8	5	−10	

Table 1 / *Jadual* 1

(b) Refer graph on page 21.

Rujuk graf di halaman 21.

(c) (i) $y =$ .....

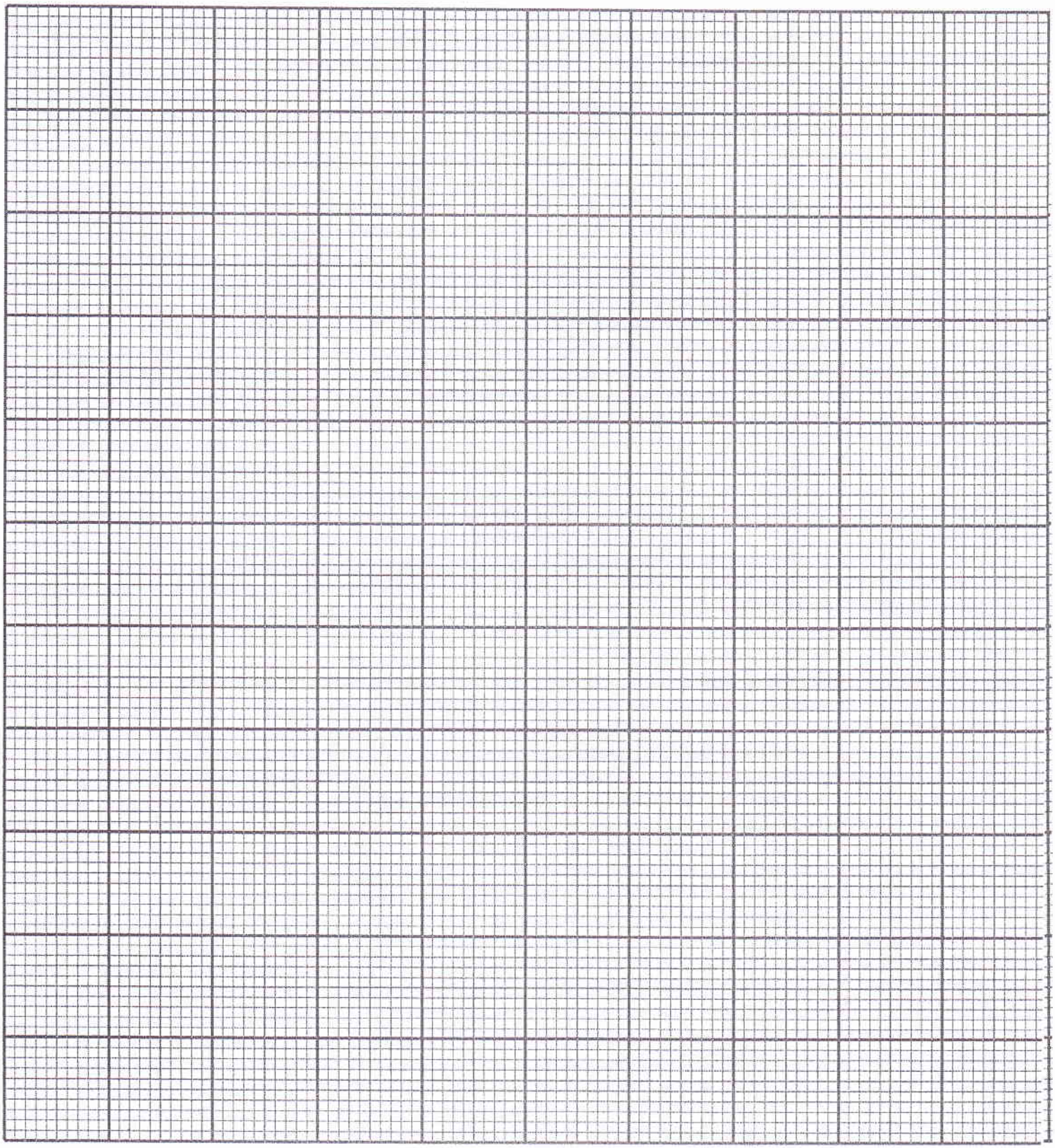
(ii) $x =$ .....

(d) The equation of the straight line : .....
Persamaan garis lurus :

$x =$ ..... , ...

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

Graph for Question 12
Graf untuk Soalan 12



For Examiner's Use

13 Diagram 13.1 shows point (2, 5) and the straight line $y = x$ drawn on a Cartesian plane.

Rajah 13.1 *menunjukkan titik* (2, 5) *dan garis lurus* $y = x$ *dilukis pada suatu satah Cartesan*

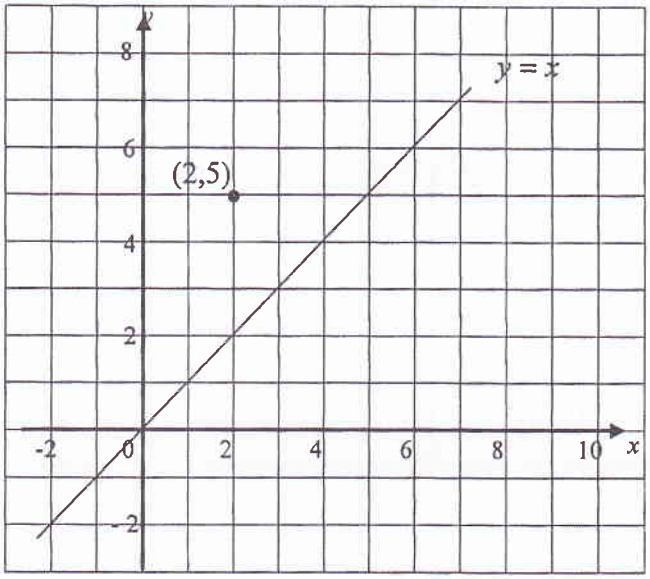


Diagram 13.1
Rajah 13.1

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

Transformation **R** is a reflection in the straight line $y = x$

State the coordinates of the image of point (2,5) under each of the following transformations :

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

Penjelmaan **R** *ialah pantulan pada garis lurus* $y = x$.

Nyatakan koordinat imej bagi titik (2,5) *di bawah penjelmaan berikut :*

(i) **T,**

(ii) **TR.**

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

Answer/ *jawapan:*

For Examiner's Use

(a) (i)

(ii)

For Examiner's Use

(b) Diagram 13.2 shows three pentagon, *ABCDE* , *FGHJK* and *SGPQR* drawn on a Cartesian plane.

Rajah 13.2 *menunjukkan tiga pentagon, ABCDE , FGHJK dan SGPQR dilukis pada suatu satah Cartesan.*

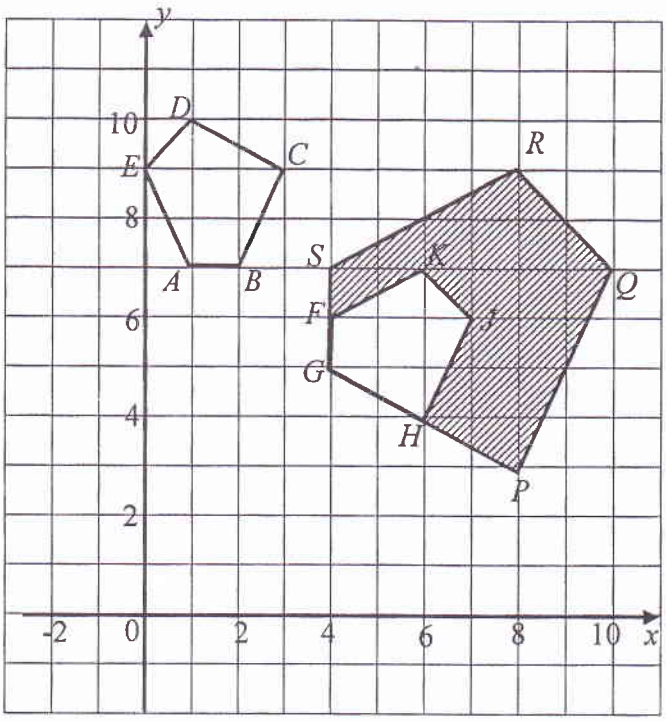


Diagram 13.2
Rajah 13.2

(i) *SGPQR* is the image of *ABCDE* under the combined transformation **VU**.

SGPQR ialah imej bagi ABCDE di bawah gabungan penjelmaan **VU**.

Describe in full, the transformation :

Huraikan selengkapnya, penjelmaan :

(a) **U**

(b) **V**

(ii) Given that the shaded region represents a region of area 330 m^2, calculate the area, in m^2, of the region represented by *FGHJK*.

Diberi bahawa kawasan berlorek mewakili luas 330 m^2, *hitungkan luas, dalam* m^2, *kawasan yang diwakili oleh FGHJK.*

[9 *marks*]
[9 *markah*]

[Lihat halaman sebelah

For Examiner's Use

Answer / *Jawapan*:

(i) *(a)*

(b)

(ii)

For Examiner's Use

14 The data below shows the masses, in kg, of old newspapers collected by 40 students in a recycling campaign.

Data di bawah menunjukkan jisim, dalam kg, surat khabar lama yang dikumpul oleh 40 orang murid dalam satu kempen kitar semula.

41	31	42	30	46	50	37	35
37	41	45	36	47	47	46	40
43	46	52	40	53	44	45	30
50	58	43	52	37	42	31	49
48	31	57	38	42	57	54	52

Diagram 14
Rajah 14

(a) Based on the data in diagram 14, complete Table 14 in the answer space.

Berdasarkan data dalam Rajah 14, *lengkapkan Jadual* 14 *di ruang jawapan.*

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

(b) Based on Table 14, calculate the estimated mean of the mass of old newspapers collected by a student.

Berdasarkan Jadual 14, *hitung min anggaran jisim surat khabar lama yang dikumpul oleh seorang murid.*

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

(c) For this part of the question, use the graph paper provided on page 29.

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan di halaman 29.

By using a scale 2 cm to 5 kg on the horizontal axis and 2 cm to 1 student on the vertical axis, draw a frequency polygon for the data.

Dengan menggunakan skala 2 cm *kepada* 5 kg *pada paksi mengufuk dan* 2 cm *kepada* 1 *murid pada paksi mencancang, lukis satu poligon kekerapan bagi data tersebut.*

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

[Lihat halaman sebelah

Answer / *Jawapan:*

For Examiner's Use

(a)

Mass (kg) *Jisim (kg)*	Mid point *Titik tengah*	Frequency *Kekerapan*
30 – 34		

Table 14
Jadual 14

(b)

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

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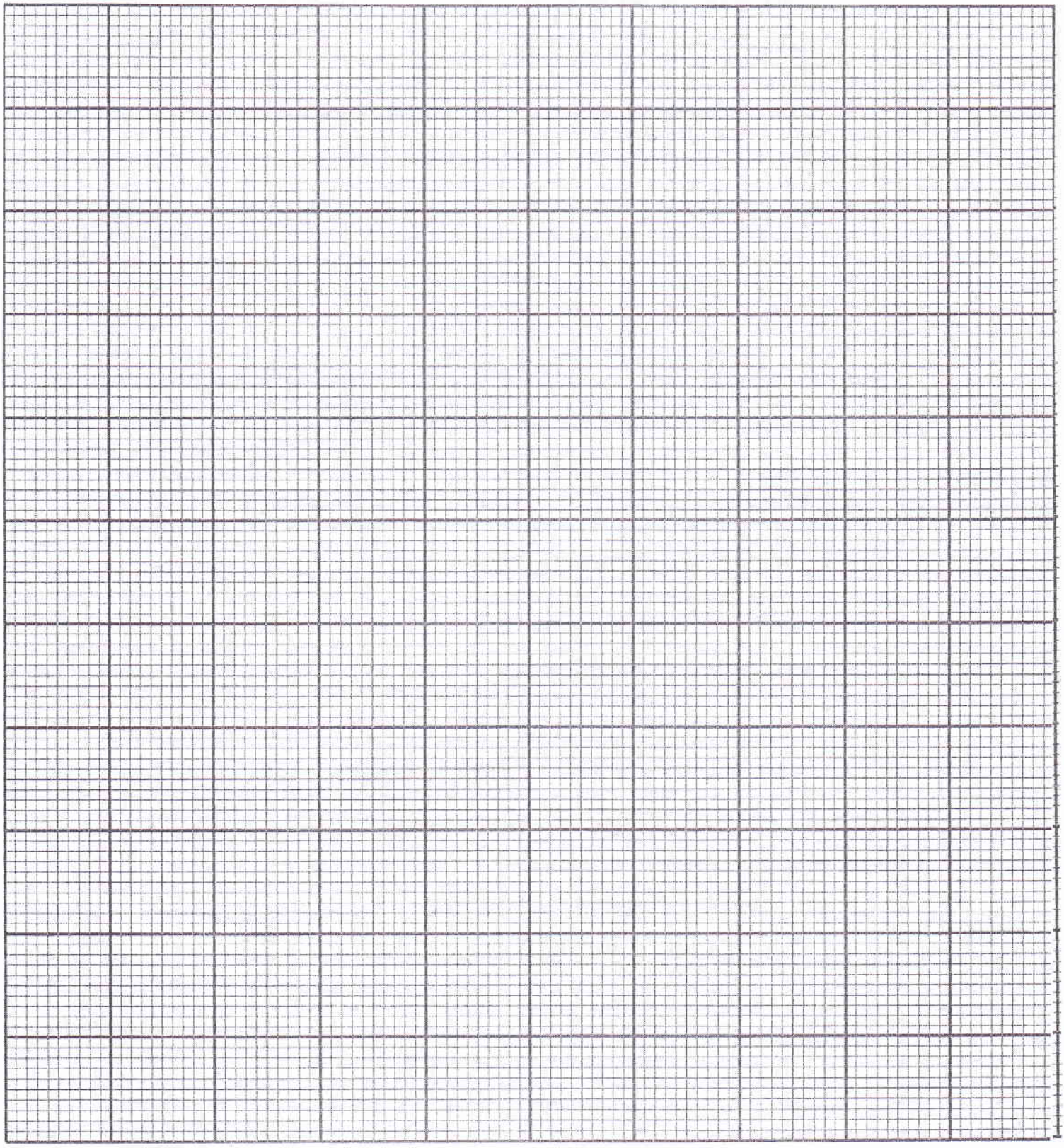
HALAMAN KOSONG

Graph for Question 14
Graf untuk Soalan 14



For Examiner's Use

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

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

Diagram 15.1 shows a solid right prism with rectangular base *ABCD* on a horizontal plane.

Rajah 15.1 *menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segiempat tepat ABCD terletak di atas satah mengufuk.*

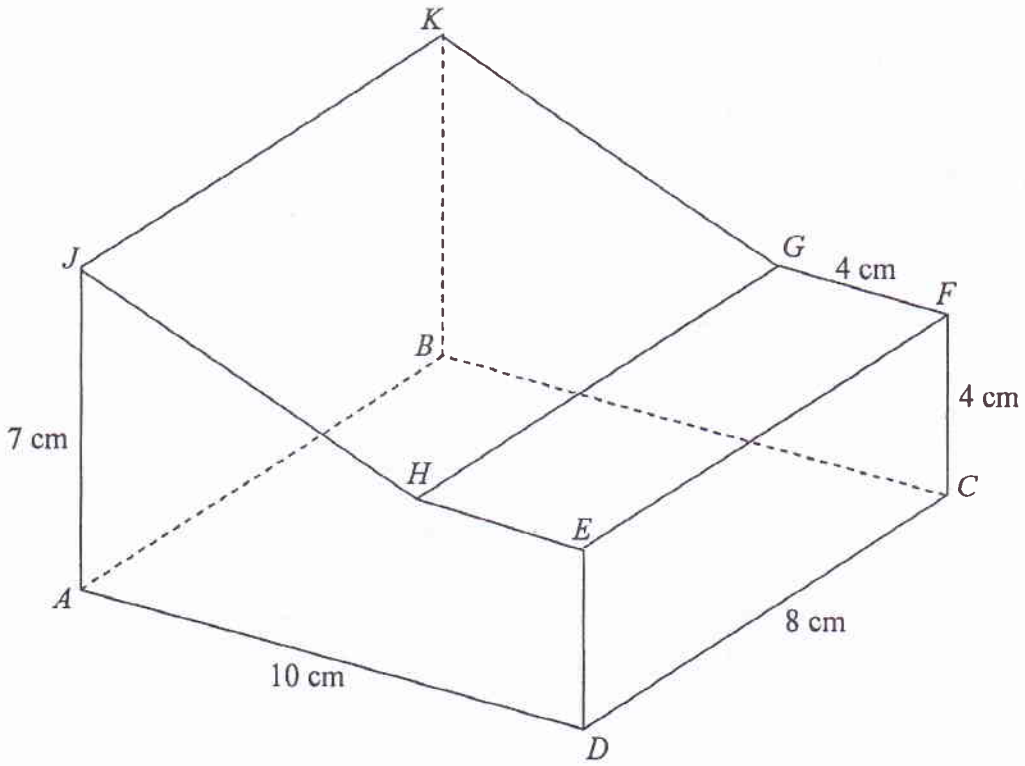


Diagram 15.1
Rajah 15.1

(a) Draw to full scale, the plan of the solid.

Lukis dengan skala penuh,pelan pepejal itu.

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

For Examiner's' Uses

Answer / Jawapan :

(a)

For Examiner's Use

(b) A half cylinder solid *HLE* is removed from the solid in Diagram 15.1. The remaining solid is shown in Diagram 15.2.

Sebuah separuh silinder HLE dikeluarkan dari pepejal dalam Rajah 15.1. *Pepejal yang tinggal ditunjukkan dalam Rajah* 15.2.

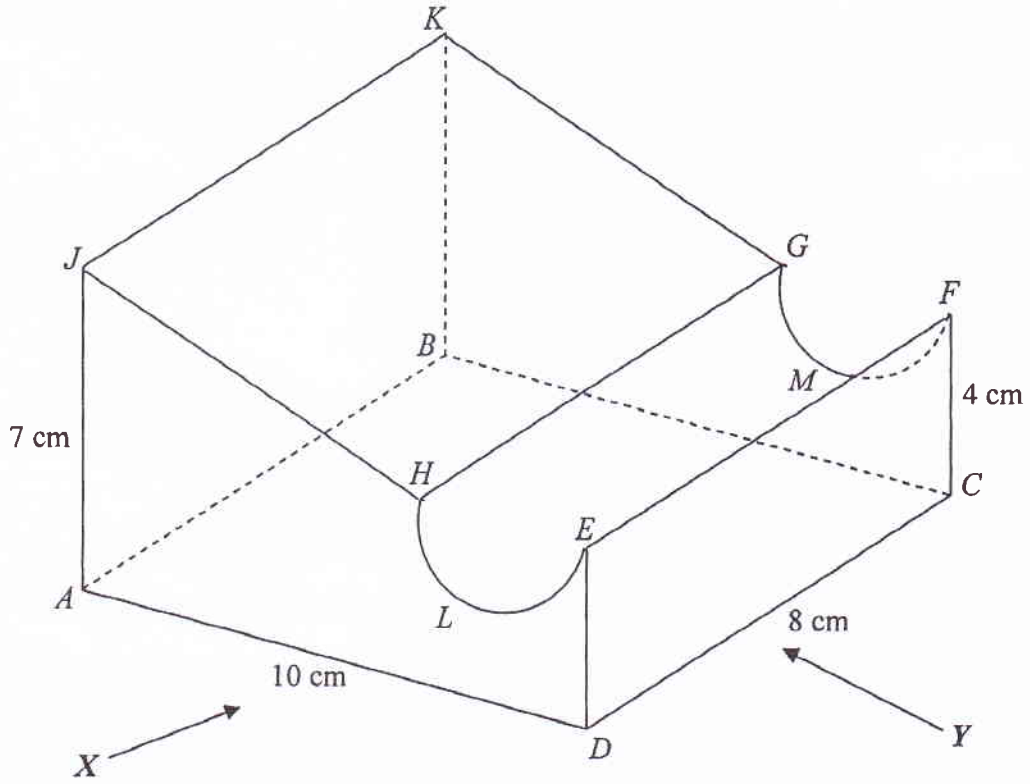


Diagram 15.2
Rajah 15.2

Draw to full scale,

Lukis dengan skala penuh,

(i) the elevation of the remaining solid on a vertical plane parallel to *AD* as viewed from ***X***.

dongakan bagi pepejal yang tinggal pada satah mencancang yang selari dengan AD sebagaimana dilihat dari ***X****.*

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

(ii) the elevation of the remaining solid on a vertical plane parallel to *DC* as viewed from ***Y***.

dongakan bagi pepejal yang tinggal pada satah mencancang yang selari dengan DC sebagaimana dilihat dari ***Y****.*

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

[Lihat halaman sebelah

For Examiner's Use

Answer / *Jawapan :*

(b) (i)

(ii)

For Examiner's Use

16 P (30°N, 50° W), Q (30°N, 130° E), R and T are four points on the surface of the earth. PR is the diameter of the earth.

P (30°N, 50° W), Q (30°N, 130° E), R dan T adalah empat titik pada permukaan bumi. PR ialah diameter bumi.

(a) State the longitude of R. [2 *marks*]

Nyatakan longitud bagi R. [2 *markah*]

(b) T lies due south of Q and the distance of TQ measured along the surface of the earth is 2400 nautical miles.
Calculate the latitude of T. [3 *marks*]

T terletak ke selatan Q dan jarak TQ diukur sepanjang permukaan bumi ialah 2400 *batu nautika.*
Hitung latitud bagi T. [3 *markah*]

(c) Calculate the shortest distance, in nautical mile, from P to Q, measured along the surface of the earth.

[3 *marks*]

Hitung jarak terpendek, dalam batu nautika, dari P ke Q diukur sepanjang permukaan bumi.

[3 *markah*]

(d) An aeroplane took off from P and flew due east to Q along the common parallel of latitude and then due south to T. The average speed for the whole flight is 750 knots.
Calculate the time taken, in hours, for the whole flight. [4 *marks*]

Sebuah kapalterbang berlepas dari P dan terbang arah ke timur ke Q di sepanjang selarian latitud sepunya dan kemudian terbang arah ke selatan ke T. Purata laju seluruh penerbangan ialah 750 *knot.*
Hitung masa diambil, dalam jam, bagi seluruh penerbangan itu.

[4 *markah*]

Answer / *Jawapan*:

For Examiner's Use

(a)

(b)

(c)

(d)

AND OF QUESTION PAPER
KERTAS SOALAN TAMAT

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, neatly cross out the answer that you have done. Then write down the new answer.

   Jika anda hendak menukar jawapan, batalkan 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 ceraian soalan ditunjukkan dalam kurungan.

8. A list of formulae is provided on pages 2 to 4.

   Satu senarai rumus disediakan di halaman 2 *hingga* 4.

9. A booklet of four-figure mathematical tables is provided.

   Sebuah buku sifir matematik empat angka disediakan.

10. You may use a non-programmable scientific calculator.

    Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

11. Hand in this question paper to the invigilator at the end of the examination.

    Serahkan kertas soalan ini kepada pengawas peperiksaan pada akhir peperiksaan.

1449/1
Mathematics
Kertas 1
2011

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA

CAWANGAN NEGERI SEMBILAN

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2011

MATHEMATICS

Kertas 1

PERATURAN PEMARKAHAN

PEPERIKSAAN PERCUBAAN SPM 2011
JABATAN PELAJARAN NEGERI SEMBILAN

MATEMATIK
Kertas 1

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

1449/2
Mathematics
Kertas 2
2011

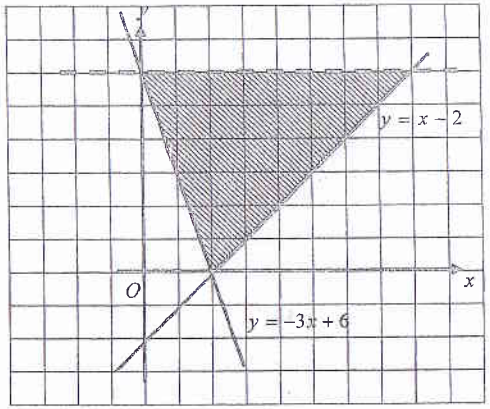
MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI SEMBILAN

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2011

MATHEMATICS

Kertas 2

PERATURAN PEMARKAHAN

No	Marking Scheme	Marks
1		P1 P2 3
2	∠ STP Tan θ = $\frac{5}{12}$ *or* equivalent θ = 22.62° *or* 22° 37 '	P1 K1 N1 3
3	$3x^2 - 7x - 6 = 0$ $(3x + 2)(x - 3) = 0$ $x = -\frac{2}{3}$, $x = 3$	K1 K1 N1 N1 4
4	$x + 6y = -3$ $9y = -9$ $y = -1$ $x = 3$	K1 K1 N1 N1 4

5 (*a*)	$\frac{1}{2}\times\frac{22}{7}\times 7\times 7\times 10$	K1
	770	N1
(*b*)	$\frac{1}{2}(16+14)h\times 10=1200$	K1
	$h=8$	N1
		4
6 (*a*)	some / sebilangan	P1
(*b*)	7 is a prime number / 7 ialah nombor perdana	K2
(*c*)	$3^n - n$	K1
	$n = 1, 2, 3, \ldots$	N1
		5
7 (*a*)	$m = \frac{0-(-3)}{0-2} = -\frac{3}{2}$	K1
	$2 = -\frac{3}{2}(4) + c$	K1
	$c = 8$	
	$y = -\frac{3}{2}x + 8$ *or* equivalent	N1
(*b*)	$-\frac{3}{2}x + 8 = 0$	K1
	x- intercept $= \frac{16}{3}$	N1
		5

8	Sample space	P1

Box P \ Box Q	T	E	A
2	(2,T)	(2,E)	(2,A)
3	(3,T)	(3,E)	(3,A)
4	(4,T)	(4,E)	(4,A)
5	(5,T)	(5,E)	(5,A)

n(s) = 12

(*a*)	{ (2, E), (2, A), (3, E), (3, A), (5, E), (5, A) }	K1
	$\frac{6}{12} = \frac{1}{2}$	N1
(*b*)	{ (2, T), (2, E), (2, A), (3, T), (4, T), (4, E), (4, A), (5, T) }	K1
	$\frac{8}{12} = \frac{2}{3}$	N1
		5
9 (*a*)	$\frac{180°}{360°}\times 2\times\frac{22}{7}\times 14$ *or* $\frac{60°}{360°}\times 2\times\frac{22}{7}\times 14$	K1
	$\frac{180°}{360°}\times 2\times\frac{22}{7}\times 14 + \frac{60°}{360°}\times 2\times\frac{22}{7}\times 14 + 14 + 14 + 14$	K1
	100.67 *or* $100\frac{2}{3}$	N1
(*b*)	$\frac{180°}{360°}\times\frac{22}{7}\times 14\times 14$ *or* $\frac{60°}{360°}\times\frac{22}{7}\times 14\times 14$	K1
	$\frac{180°}{360°}\times\frac{22}{7}\times 14\times 14 - \frac{60°}{360°}\times\frac{22}{7}\times 14\times 14$	K1
	$205\frac{1}{3}$ *or* 205.33	N1
		6

10 (*a*)	21	P1
(*b*)	$\frac{21-0}{6-0}$ *or* $\frac{0-21}{0-6}$	K1
	$\frac{21}{6}$	N1
(*c*)	$\frac{1}{2}\times 6\times 21$ *or* 4×21 *or* $\frac{1}{2}(21+v)\times 3$	K1
	$\frac{1}{2}\times 6\times 21 + 4\times 21 + \frac{1}{2}(21+v)\times 3 = 223.5$	K1
	$v = 30$	N1
		6
11 (*a*)	$m = -1$	P1
	$k = -2$	P2
	Note:	
	$3(-2)-(-4)(1)$, award P1	
(*b*)	$\begin{pmatrix}3 & -4\\ 1 & -2\end{pmatrix}\begin{pmatrix}x\\ y\end{pmatrix} = \begin{pmatrix}13\\ 6\end{pmatrix}$	K1
	$\begin{pmatrix}x\\ y\end{pmatrix} = -\frac{1}{2}\begin{pmatrix}-2 & 4\\ -1 & 3\end{pmatrix}\begin{pmatrix}13\\ 6\end{pmatrix}$	K1
	$x = 1$	N1
	$y = -\frac{5}{2}$	N1
		7

12 (*a*)		K1K1

x	-3	4
y	20	–43

(*b*)	*Graph (Refer graph on Lampiran1)*	
	Axes drawn in the correct directions with uniform scalesfor $-4 \le x \le 4$and$-43 \le y \le 53$	P1
	All 7 points and *2 points correctly plotted *or* curve passes through all the points for $-4 \le x \le 4$ and $-43 \le y \le 53$	K2
	A smooth and continuous curve without any straight line and passes through all 9 correct points using the given scale for $-4 \le x \le 4$ and $-43 \le y \le 53$	N1
	Notes:	
	1. 7 or 8 points correctly plotted, award K1	
	2. Ignore curve out of range	
(*c*) (i)	$y = -25 \pm 1$	P1
(ii)	$x = -2.8 \pm 0.1$	P1
(*d*)	Identify equation $y = -10x - 5$ *or* equivalent.	K1
	Straight line $y = -10x - 5$ correctly drawn	K1
	$x = -0.75 \pm 0.05$, -3.3 ± 0.1	N1N1
		12

13 *(a)* (i)	(4 , 2)	P1
(ii)	(7, – 1)	P2
(b) (i)	U : Rotation 90° clockwise / 270° anticlockwise at centre (2,5) Putaran 90° arah jam / 270° lawan arah jam pada pusat (2,5)	P3
	V : Enlargement with scale factor 2 at centre (4,5) Pembesaran dengan factor skala 2 di pusat (4,5)	P3
(c) (ii)	$2^2 = \frac{330 + x}{x}$	K1K1
	$x = 110$	N1
		12

14 *(a)*

Class interval *Selang kelas (kg)*	Midpoint *Titik tengah*	Frequency *Kekerapan*
30 – 34	32	5
35 – 39	37	6
40 – 44	42	10
45 – 49	47	9
50 – 54	52	7
55 – 59	57	3

P1P1P2

Note:

Allow two mistakes in frequency for P1

(b) $\frac{^*5\times32+^*6\times37+^*10\times42+^*9\times47+^*7\times52+^*3\times57}{^*5+^*6+^*10+^*9+^*7+^*3}$ K2

44 N1

Graph

Axes drawn in the correct direction with uniform scales for $27 \le x \le 62$ and $0 \le y \le 10$. P1

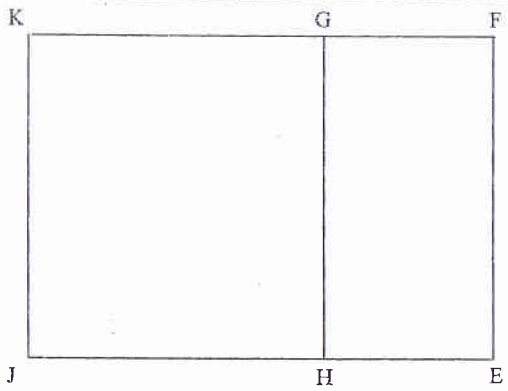
*6 points correctly plotted *or* line of frequency polygon seen on the points. K2

Point (27,0) and (62,0) plotted *or* line seen on the frequency polygon. N1

Correct frequency polygon with 8 correct points are plotted N1

12

15 *(a)*

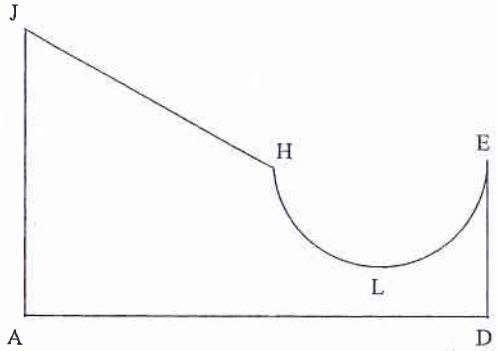


Correct shape with rectangles *JEFK*, *JHGK* and *HEFG* . K1
All solid lines

JE = KF > JK = HG = EF > JH = KG > HE = GF K1

The measurement is accurate to ± 0.2 cm (one way) and the angles at all vertices of the rectangles are 90° ± 1°. N1

(b)(i)

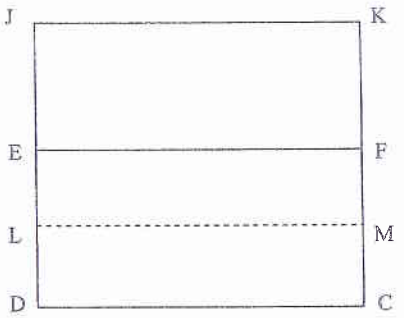


Correct shape *ADELHJ*. K1
All solid lines

AD > AJ > ED K1

Measurements correct to ± 0.2 cm (one way) and
$\angle A$, $\angle D = 90° \pm 1°$ N2

15*(b)* (ii)



Correct shape with rectangles *DCKJ*, *DCFE* and *EFKJ* . K1
All solid lines.

Note:

L and *M* joined with dashed line to from rectangle *LMFE* K1
LM is dotted line.

DC > CK > CF > FK > CM = MF K1

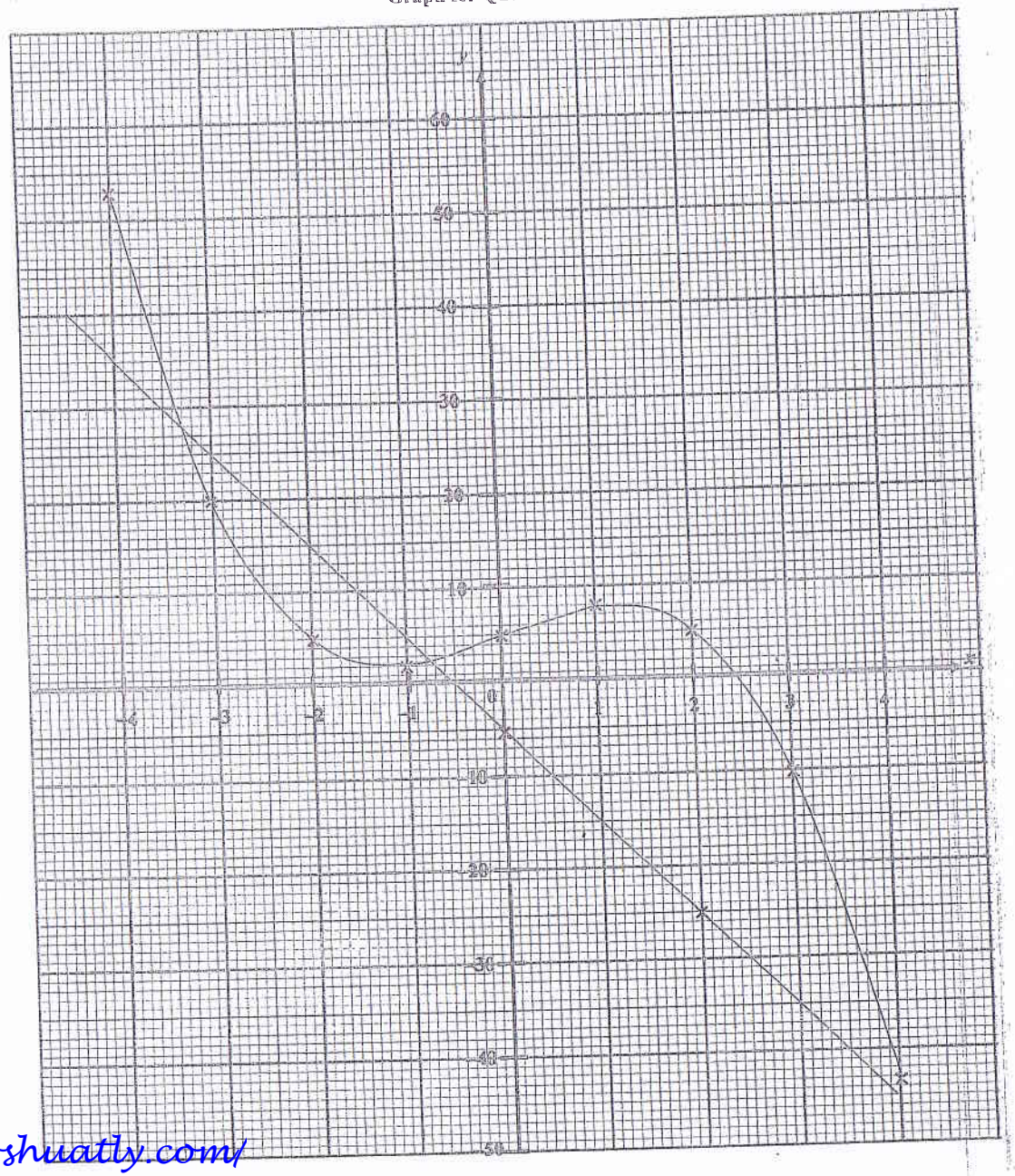
Measurement correct to ± 0.2 cm. (one way) and all angles at vertices of rectangles is 90° ± 1°. N2

12

16 (a)	$130° E$ or $130° T$	P1P1
(b)	$\theta \times 60° = 2400$	K1
	$40° - 30°$	K1
	$10° S$	N1
(c)	$120° \times 60$	K1K1
	7200	N1
(d)	$180° \times 60 \cos 30°$	K1
	$\frac{180° \times 60 \cos 30° + 2400}{t} = 750$	K1K1
	15.67	N1
		12

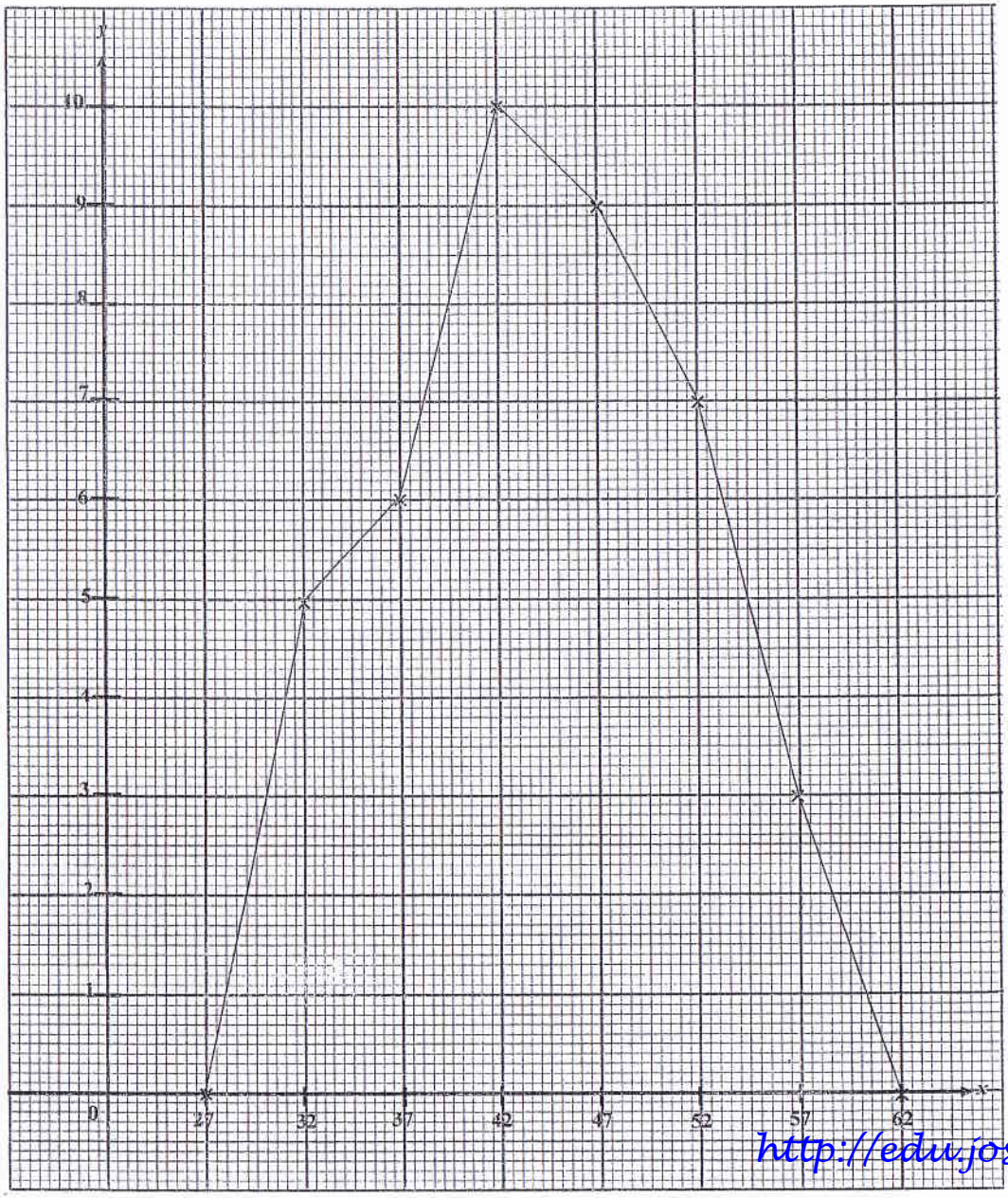
Lampiran 1

Graph for Question 12



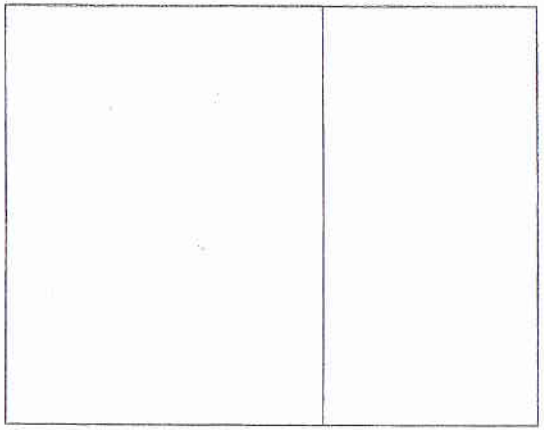
Lampiran 2

Graph for Question 14

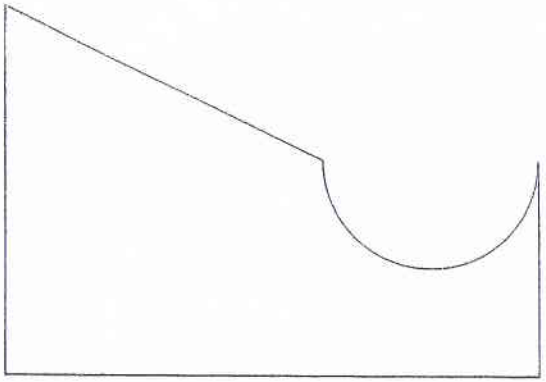


LAMPIRAN 3 : 15. ACTUAL SIZE

15 (a)



15 (b) (i)



15 (b) (ii)