



**KEMENTERIAN
PENDIDIKAN
MALAYSIA**

<http://cikguadura.wordpress.com/>

**BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH
DAN SEKOLAH KECEMERLANGAN**

**PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2014
PERCUBAAN SIJIL PELAJARAN MALAYSIA**

MATEMATIK

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 ini mengandungi **30** 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 = $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

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

7 Average speed = $\frac{\text{distance travelled}}{\text{time taken}}$ / 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 = $\frac{\text{Hasil tambah (nilai titik tengah kelas} \times \text{kekerapan) nilai data}}{\text{Hasil tambah kekerapan}}$

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

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

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

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

14 Pythagoras Theorem / Teorem Pithagoras

$$c^2 = a^2 + b^2$$

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 = $2\pi rh$ / *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 = $(n - 2) \times 180^\circ$
- 12 $\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$ / $\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
- 13 $\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$ / $\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
- 14 Scale factor, $k = \frac{PA'}{PA}$ / *Faktor skala, $k = \frac{PA'}{PA}$*
- 15 Area of image = $k^2 \times \text{area of object}$ / *Luas imej = $k^2 \times \text{luas objek}$*

This question paper consists of **40** questions. Answer **all** questions.
Kertas soalan ini mengandungi 40 soalan. Jawab semua soalan.

- 1 Round off 2.7489 to three significant figures.

Bundarkan 2.7489 kepada tiga angka bererti.

- A 2.74
- B 2.740
- C 2.75
- D 2.750

- 2 Express 0.0000254 in standard form.

Ungkapkan 0.0000254 dalam bentuk piawai.

- A 2.54×10^5
- B 2.54×10^4
- C 2.54×10^{-5}
- D 2.54×10^{-4}

- 3 $6.1 \times 10^{12} - 2.3 \times 10^{11} =$

- A 3.8×10^{12}
- B 5.87×10^{12}
- C 5.87×10^{11}
- D 3.8×10^{11}

- 4 A tank contains 440 litres of water. 30% of the water is poured out. The remainder of the water is then divided into 4 equal containers. Find the volume of water in each container, in ml.

Sebuah tangki mengandungi 440 liter air. Kemudian, sebanyak 30% air telah dikeluarkan. Baki air telah dituang ke dalam 4 bekas yang sama besar. Cari isipadu air setiap bekas tersebut dalam ml.

- A 3.3×10^1
- B 3.3×10^4
- C 7.7×10^1
- D 7.7×10^4

- 5 Express 352_8 as a number in base five.

Ungkapkan 352_8 sebagai satu nombor dalam asas lima.

- A 234_5
 B 1414_5
 C 4141_5
 D 432_5

- 6 $11011_2 + 111110_2 =$

- A 1011001_2
 B 1010101_2
 C 1100101_2
 D 1101100_2

- 7 In Diagram 1, $ABCDE$ and BJD are regular polygons.

Dalam Rajah 1, $ABCDE$ dan BJD ialah poligon sekata.

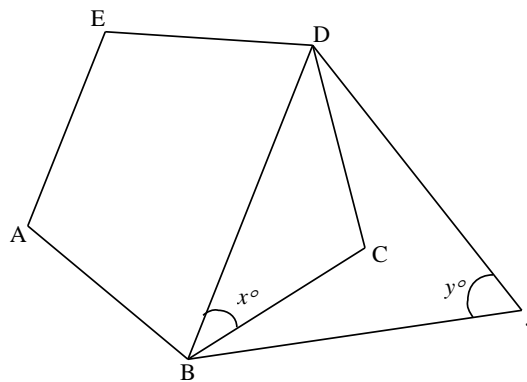


Diagram 1
Rajah 1

Find the value of $x + y$.

Cari nilai $x + y$.

- A 36°
 B 63°
 C 90°
 D 96°

8 Diagram 2 shows an irregular hexagon $FGHIJK$.

Rajah 2 menunjukkan heksagon tidak sekata $FGHIJK$.

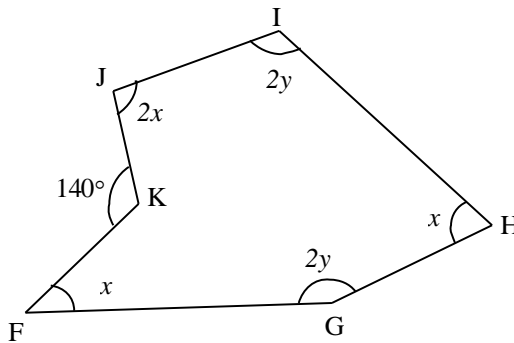


Diagram 2
Rajah 2

Find the value of $x + y$.

Cari nilai $x + y$.

- A 40°
- B 55°
- C 125°
- D 220°

- 9 In Diagram 3, PQR is a tangent for the circle $MJLQ$ at point Q . JOK is a diameter for the circle JKL .

Dalam Rajah 3, PQR ialah tangent kepada bulatan $MJLQ$ di titik Q . JOK ialah diameter kepada bulatan JKL .

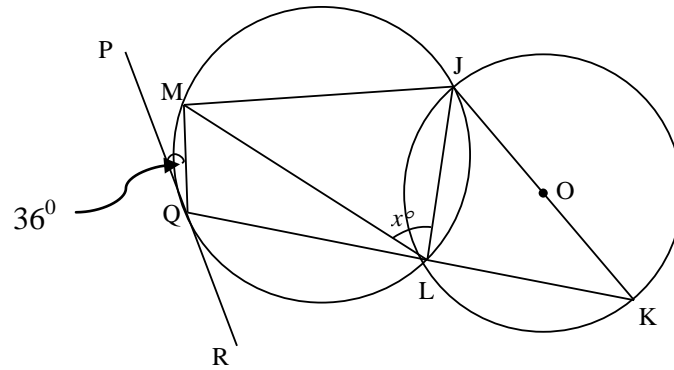


Diagram 3
Rajah 3

Find the value of x .

Cari nilai x .

- A 36°
- B 45°
- C 54°
- D 63°

- 10 Diagram 4 shows 5 triangles, **K**, **A**, **B**, **C**, and **D**, drawn on square grids.

Rajah 4 menunjukkan 5 segi tiga, K, A, B, C, dan D yang dilukis pada grid segi empat sama.

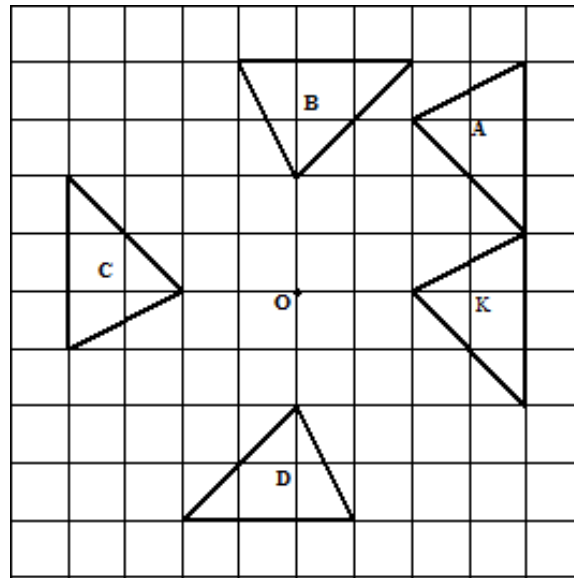


Diagram 4
Rajah 4

Which of the triangles, **A**, **B**, **C**, or **D** is the image of triangle **K** under a rotation 90° anticlockwise at centre **O**?

Antara segi tiga A, B, C, atau D yang manakah ialah imej untuk segi tiga K di bawah putaran 90° arah lawan jam pada pusat O?

- 11 Under an enlargement, the area of an object is 180 cm^2 and the scale factor of enlargement is $\frac{1}{3}$. Find the area of its image.

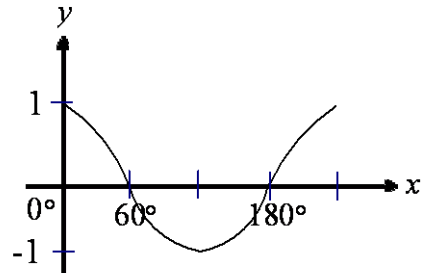
Di bawah satu pembesaran, luas suatu objek ialah 180 cm^2 dan faktor skala pembesaran itu ialah $\frac{1}{3}$. Cari luas imejnya.

- A 20 cm^2
- B 60 cm^2
- C 540 cm^2
- D 1620 cm^2

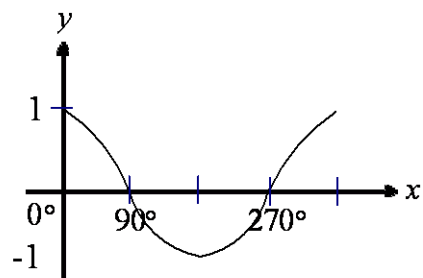
12 Which graph represents graph of $y = \cos x^\circ$?

Graf manakah yang mewakili $y = \cos x^\circ$?

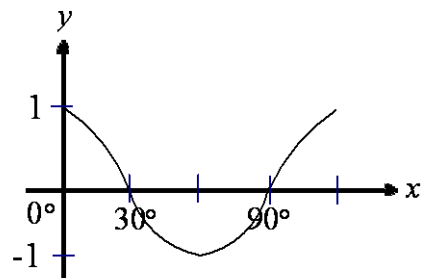
A



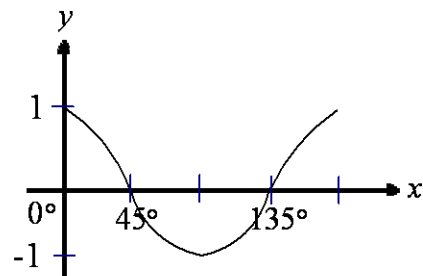
B



C



D



- 13 Diagram 5 shows two right-angled triangles, JKM and IJN . JKL is a straight line and $MN = NJ$.

Rajah 5 menunjukkan dua segi tiga bersudut tegak, JKM dan IJN . JKL ialah garis lurus dan $MN = NJ$.

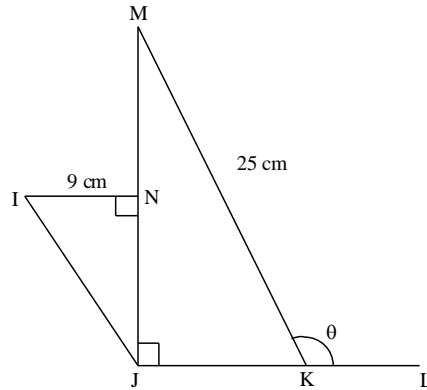


Diagram 5
Rajah 5

Given that $\sin \angle NJI = \frac{3}{5}$, find the value of $\cos \theta$.

Diberi bahawa $\sin \angle NJI = \frac{3}{5}$, cari nilai bagi kos θ .

- A $\frac{24}{25}$
- B $-\frac{24}{25}$
- C $\frac{7}{25}$
- D $-\frac{7}{25}$

14 In Diagram 6, point J and point K lie on the arc of a unit circle with centre O .

Dalam Rajah 6, titik J dan titik K terletak di atas lengkok suatu bulatan unit berpusat O .

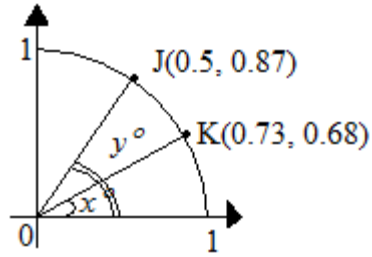


Diagram 6
Rajah 6

Find the value of $\tan x^\circ + \cos y^\circ$.

Cari nilai $\tan x^\circ + \cos y^\circ$.

- A 0.93
- B 1.23
- C 1.43
- D 1.55

- 15 Diagram 7 shows three points J , K and L , on a horizontal plane. K lies due north of L and the bearing of J from K is 221° .

Rajah 7 menunjukkan tiga titik J , K , dan L , yang terletak pada suatu satah mengufuk. K berada ke utara L dan bearing J dari K ialah 221° .

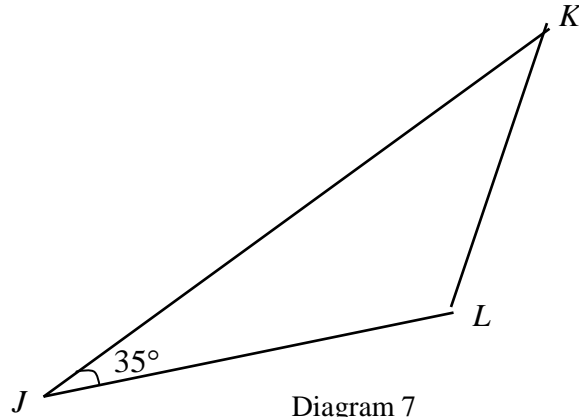


Diagram 7
Rajah 7

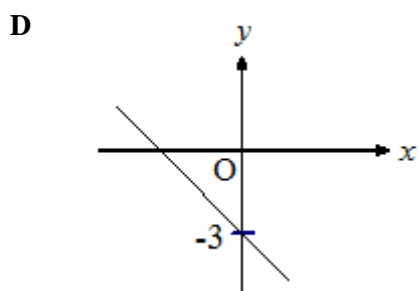
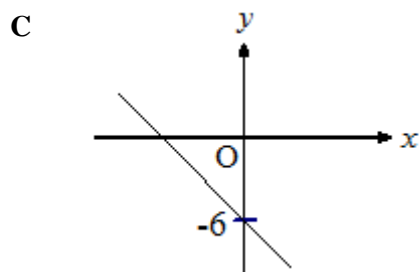
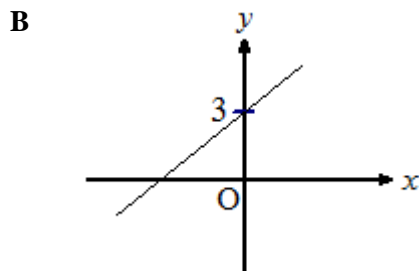
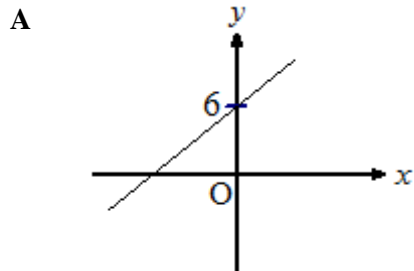
Find the bearing of L from J .

Cari bearing L dari J .

- A 041°
- B 076°
- C 256°
- D 265°

16 Which of the following graph represents $2y + x + 6 = 0$?

Antara graf berikut, yang manakah mewakili $2y + x + 6 = 0$?



- 17 Diagram 8 shows a cuboid. Name the angle between the line XW and the plane $QRWV$.

Rajah 8 menunjukkan sebuah kuboid. Namakan sudut di antara garis XW dengan satah $QRWV$.

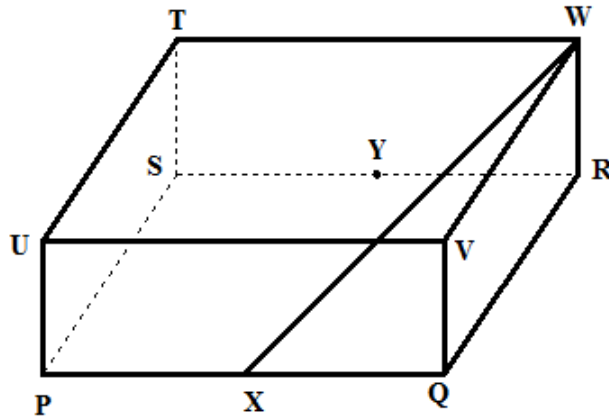


Diagram 8

Rajah 8

- A $\angle QWX$
- B $\angle WQR$
- C $\angle WXV$
- D $\angle YXW$

- 18 In Diagram 9, PR and TS are two vertical poles on a horizontal plane. Q is a point on PR such that $QR=TS$.

Dalam rajah 9, PR dan TS ialah tiang tegak pada satu satah mengufuk. Q ialah satu titik pada PR dengan keadaan $QR=TS$.

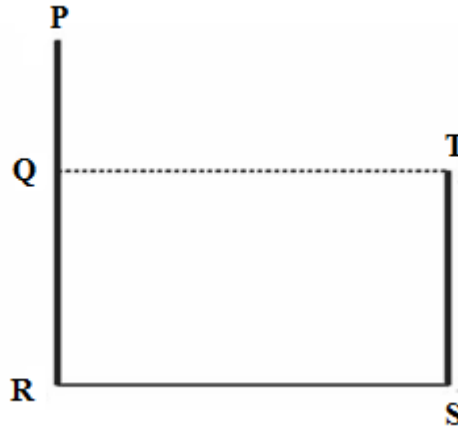


Diagram 9
Rajah 9

Name the angle of depression of T from P .

Namakan sudut tunduk T dari P .

- A $\angle PTQ$
- B $\angle PSQ$
- C $\angle TPQ$
- D $\angle SPQ$

- 19 Diagram 10 shows a tower JK . The points K and L lie on a horizontal plane.

Rajah 10 menunjukkan sebuah menara JK . Titik K dan L terletak di atas satah mengufuk.

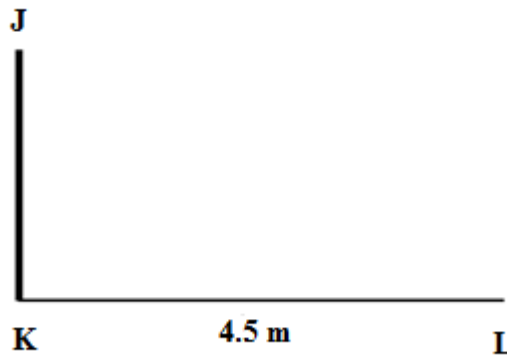


Diagram 10

Rajah 10

The angle of elevation of J from L is 27° . Calculate height of the tower in m .
Sudut dongakan J dari L ialah 27° . Hitungkan tinggi menara itu dalam m .

- A 2.04
- B 2.29
- C 4.01
- D 2.19

- 20 Diagram 11 shows a mountain with vertical height of AB , 1 200 m above sea level. The distance B from C is 1 800 m.

Rajah 11 menunjukkan sebuah bukit dengan ketinggian AB , 1 200 m dari aras laut. Jarak B dari C ialah 1 800 m.

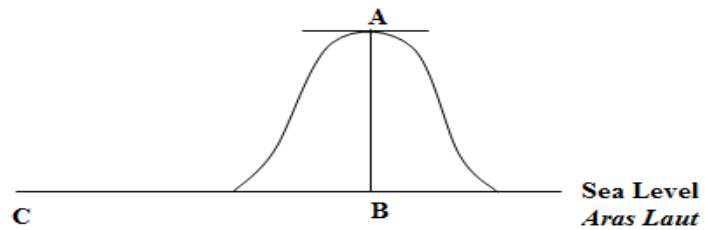


Diagram 11
Rajah 11

The angle of elevation of A from C is

Sudut dongakan A dari C ialah

- A 33.69°
 B 41.81°
 C 48.19°
 D 56.30°
- 21 $6p(p+2q)-(3p-q)^2 =$
- A $-3p^2 + 6pq + q^2$
 B $-3p^2 + 12pq + q^2$
 C $-3p^2 + 12pq - q^2$
 D $-3p^2 + 18pq - q^2$

22 Given $h = \frac{2k+1}{k-5}$, express k in terms of h .

Diberi $h = \frac{2k+1}{k-5}$, ungkapkan k dalam sebutan h .

A $k = \frac{1+5h}{h-2}$

B $k = \frac{1-5h}{h+2}$

C $k = \frac{1+h}{h-2}$

D $k = \frac{1+h}{h+2}$

23 Given that $\frac{5m-2}{3} = 8-(m-2)$, find the value of m .

Diberi bahawa $\frac{5m-2}{3} = 8-(m-2)$, cari nilai m .

A 2

B 4

C 8

D 16

24 $\frac{1}{\sqrt[3]{5^2}} =$

A $5^{-\frac{3}{2}}$

B $5^{-\frac{2}{3}}$

C $5^{\frac{2}{3}}$

D $5^{\frac{3}{2}}$

25

Simplify $\frac{h^2 \times (4k^6)^{\frac{1}{2}}}{(hk^{-2})^3}$

Ringkaskan $\frac{h^2 \times (4k^6)^{\frac{1}{2}}}{(hk^{-2})^3}$

A $4h^{-1}k^3$

B $4hk^9$

C $2h^{-1}k^9$

D $2h^5k^3$

26

List all the integers x which satisfy both the simultaneous linear inequalities $3 < 13 - 2x$ and

$$3 + \frac{x}{2} \geq 4.$$

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

$$3 < 13 - 2x \text{ dan } 3 + \frac{x}{2} \geq 4.$$

A 1, 2, 3, 4

B 1, 2, 3, 4, 5

C 2, 3, 4

D 2, 3, 4, 5

27

Find the solution for $-5x \leq 3(x + 8)$.

Cari penyelesaian bagi $-5x \leq 3(x + 8)$.

A $x \leq -1$

B $x \leq -3$

C $x \geq -3$

D $x \leq -12$

28 Diagram 12 is a bar chart which shows the number of cars sold by Shahmi from January to June.

Rajah 12 ialah carta palang yang menunjukkan bilangan sejenis kereta yang dijual oleh Shahmi dalam bulan Januari sehingga bulan Jun.

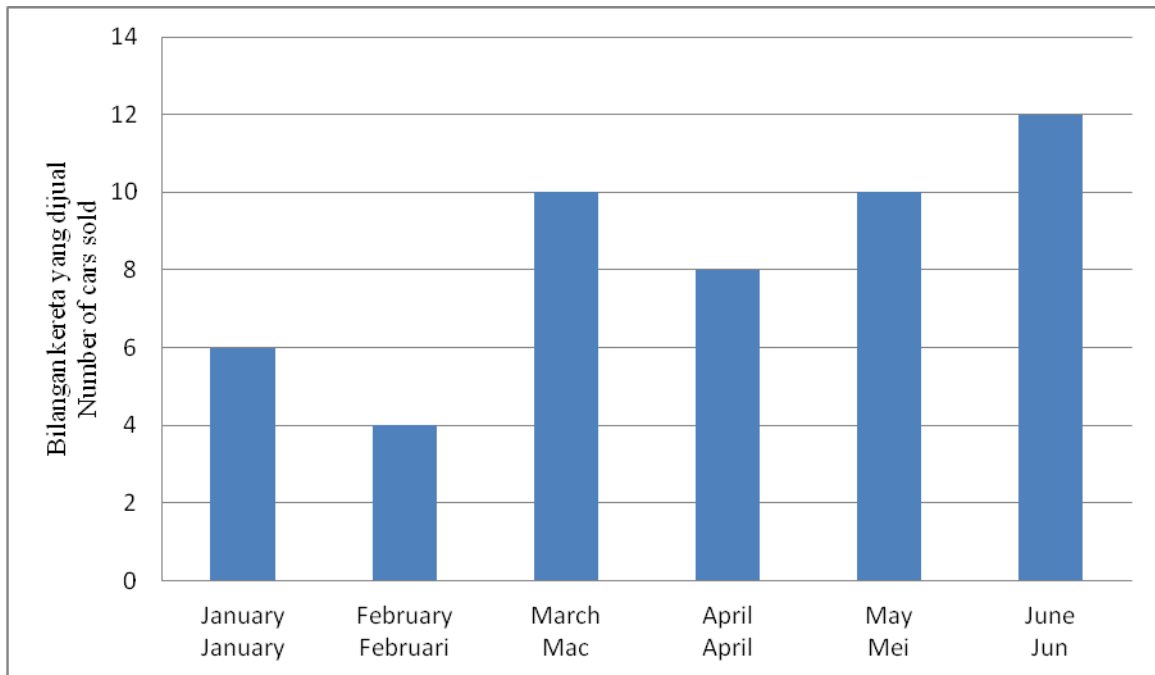


Diagram 12
Rajah 12

If the data is represented by a pie chart, calculate the sector angle represented the number of the car that sold in the last three month.

Jika semua maklumat dalam carta palang itu diwakili oleh sebuah carta pai, hitungkan sudut sektor yang mewakili bilangan kereta yang dijual dalam tiga bulan yang terakhir.

- A 87°
- B 108°
- C 144°
- D 216°

- 29 Table 1 shows the School Average Grade obtained by a group of 50 school in a final examination.

Jadual 1 menunjukkan Gred Purata Sekolah yang diperolehi oleh sekumpulan 50 buah sekolah dalam suatu peperiksaan.

School Average Grade <i>Gred Purata Sekolah</i>	1.2	1.5	2.0	2.5	3.0	3.5
Frequency <i>Kekerapan</i>	12	14	12	7	4	1

Table 1
Jadual 1

Determine the School Average Grade mode.

Tentukan mod Gred Purata Sekolah.

- A 12
- B 1.2
- C 1.5
- D 14

- 30 It is given that set $S = \{\text{pentagon, hexagon, octagon}\}$. Determine the number of subset for set S .

Diberi bahawa set $S = \{\text{pentagon, heksagon, oktagon}\}$. Tentukan bilangan subset bagi set S .

- A 8
- B 7
- C 9
- D 3

- 31 Diagram 13 shows a Venn diagram with the universal set $\xi = \{\text{Form five students}\}$,
 Set $M = \{\text{Students who choose Biology}\}$
 Set $R = \{\text{Students who choose Physics}\}$

*Rajah 13 menunjukkan gambarajah Venn dengan set semesta $\xi = \{\text{Pelajar Tingkatan Lima}\}$,
 Set $M = \{\text{Pelajar yang memilih mata pelajaran Biologi}\}$
 Set $R = \{\text{Pelajar yang memilih mata pelajaran Fizik}\}$*

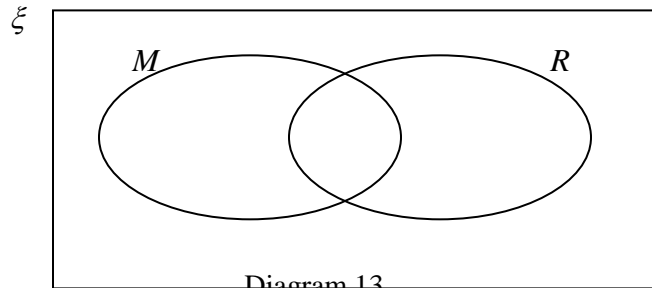


Diagram 13

Rajah 13

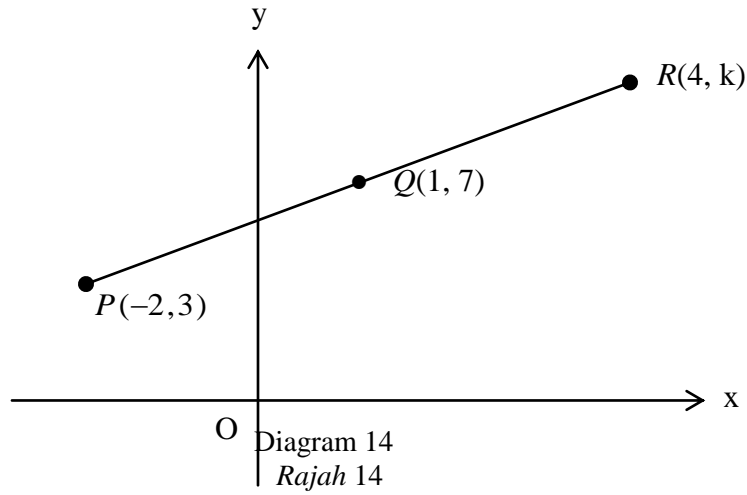
Given that $n(M) = 108$, $n(R) = 84$, $n(M \cap R) = 14$ and the total number of Form Five student is 200. Find the number of students who **do not** choose either subject.

*Diberi $n(M) = 108$, $n(R) = 84$, $n(M \cap R) = 14$ dan jumlah pelajar Tingkatan Lima ialah 200. Cari bilangan pelajar yang **tidak** memilih mana-mana mata pelajaran.*

- A 6
- B 8
- C 16
- D 22

- 32 Diagram 14 shows points $P(-2, 3)$, $Q(1, 7)$ and $R(4, k)$ lies on the straight line. Find the value of k .

Rajah 14 menunjukkan titik $P(-2, 3)$, $Q(1, 7)$ dan $R(4, k)$ yang terletak pada suatu garis lurus. Cari nilai k .



- A 11
- B 10
- C 9
- D 8

33 Diagram 15 shows a straight line GH on a Cartesian plane.

Rajah 15 menunjukkan satu garis lurus GH pada suatu satah Cartesan.

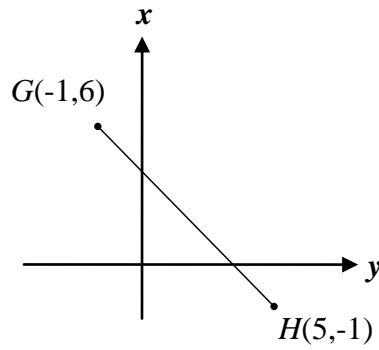


Diagram 15
Rajah 15

Find the gradient of the GH .

Cari kecerunan GH .

A $-\frac{7}{6}$

B $-\frac{6}{7}$

C $\frac{4}{7}$

D $-\frac{4}{7}$

- 34 Diagram 16 shows a set of 13 number cards.

Rajah 16 menunjukkan satu set 13 kad nombor.

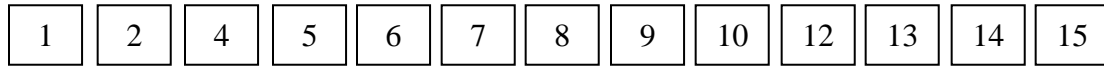


Diagram 16
Rajah 16

A card is chosen at random.
Find the probability that an even number card is chosen.

*Satu kad dipilih secara rawak.
Cari kebarangkalian bahawa satu kad nombor genap dipilih.*

- A $\frac{4}{13}$
- B $\frac{6}{13}$
- C $\frac{7}{13}$
- D $\frac{7}{15}$

- 35 Diagram 17 shows a circular board which is divided into 12 equal sectors and labelled with alphabets.

Rajah 17 menunjukkan sekeping papan bulatan yang dibahagi kepada 12 sektor yang sama besar dan dilabel dengan huruf.

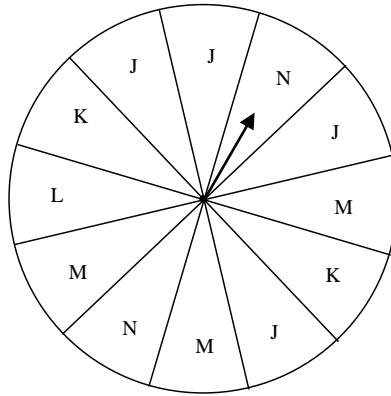


Diagram 17
Rajah 17

A pointer is placed at the centre of the board. The pointer is rotated about the centre of the board and will equally likely to stop at any sector.

What is the probability that the pointer will **not** stopped in the sectors labelled *J*?

Satu jarum penunjuk diletakkan di pusat papan itu. Jarum penunjuk itu diputarkan pada pusat papan itu dan akan berhenti di mana-mana sektor dengan kemungkinan yang sama.

*Apakah kebarangkalian bahawa jarum penunjuk itu **tidak** akan berhenti dalam sector yang berlabel *J*?*

A $\frac{1}{3}$

B $\frac{2}{3}$

C $\frac{1}{12}$

D $\frac{1}{6}$

$$36 \quad \begin{pmatrix} 3 \\ 7 \end{pmatrix} - \begin{pmatrix} -2 \\ 5 \end{pmatrix} + \frac{1}{2} \begin{pmatrix} -6 \\ 8 \end{pmatrix} = \begin{pmatrix} m \\ 6 \end{pmatrix}$$

Find the value of m .

Cari nilai m .

- A -1
- B -2
- C 2
- D 11

$$37 \quad \begin{pmatrix} -1 \\ 3 \end{pmatrix} \begin{pmatrix} 2 & 4 \end{pmatrix} =$$

- A (10)
- B (-2 12)
- C $\begin{pmatrix} -2 \\ 12 \end{pmatrix}$
- D $\begin{pmatrix} -2 & -4 \\ 6 & 12 \end{pmatrix}$

- 38 In Diagram 18, R is a point on the earth. N is the North Pole, S is the South Pole and NOS is the axis of the earth.

Dalam Rajah 18, R ialah titik di atas permukaan bumi. U ialah Kutub Utara, S ialah Kutub Selatan dan UOS ialah paksi Bumi.

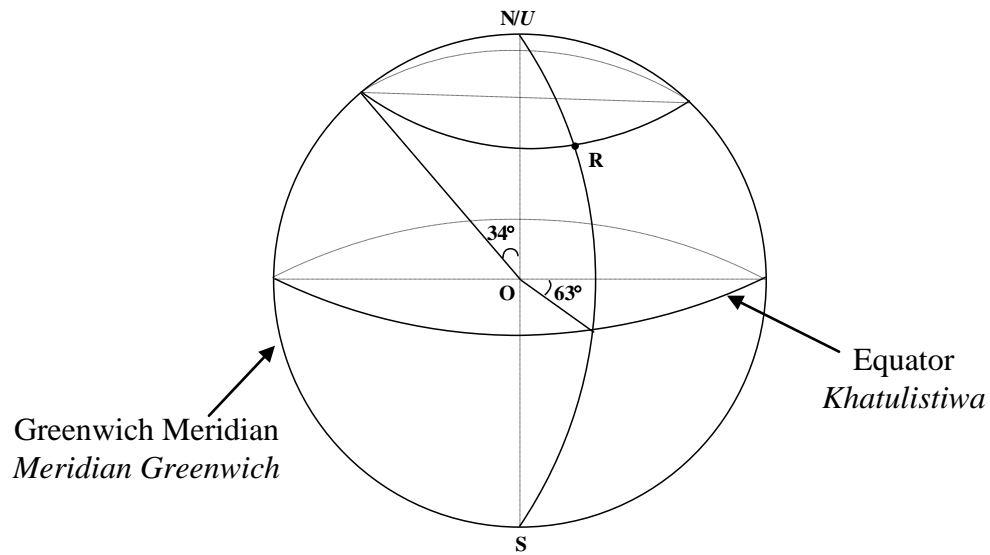


Diagram 18
Rajah 18

Find the location of point R .

Cari kedudukan titik R .

- A** $(34^{\circ}N, 63^{\circ}E)$
 $(34^{\circ}U, 63^{\circ}T)$
- B** $(34^{\circ}N, 117^{\circ}E)$
 $(34^{\circ}U, 117^{\circ}T)$
- C** $(56^{\circ}N, 63^{\circ}E)$
 $(56^{\circ}U, 63^{\circ}T)$
- D** $(56^{\circ}N, 117^{\circ}E)$
 $(56^{\circ}U, 117^{\circ}T)$

39. It is given that r varies inversely as the square root of s and $r = 4$ when $s = 36$.
Calculate the value of r when $s = 25$

Diberi bahawa r berubah secara songsang dengan punca kuasa dua s dan $r = 4$ apabila $s = 36$.

Hitung nilai r apabila $s = 25$.

A $\frac{24}{5}$

B $\frac{24}{25}$

C $\frac{144}{25}$

D $\frac{144}{5}$

40. It is given that K varies directly as the cube root of L and inversely as the square of M .
Find the relation between K , L , and M .

Diberi bahawa K berubah secara langsung dengan punca kuasa tiga L dan secara songsang dengan kuasa dua M .

Cari hubungan antara P , Q , dan R .

A $K \propto \frac{L^3}{M^2}$

B $K \propto \frac{\sqrt[3]{L}}{M^2}$

C $K \propto \frac{M^2}{\sqrt[3]{L}}$

D $K \propto \frac{M^2}{L^3}$

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

<http://cikguadura.wordpress.com/>

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 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 blacken 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 yang tidak boleh diprogram.



KEMENTERIAN
PENDIDIKAN
MALAYSIA

<http://cikguadura.wordpress.com/>

BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH
DAN SEKOLAH KECEMERLANGAN

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2014
PERCUBAAN SIJIL PELAJARAN MALAYSIA

MATEMATIK

Kertas 2

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

Untuk Kegunaan Pemeriksa			
Kod 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 ini mengandungi 31 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 = $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

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

7 Average speed = $\frac{\text{distance travelled}}{\text{time taken}}$ / 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 = $\frac{\text{Hasil tambah (nilai titik tengah kelas} \times \text{kekerapan) nilai data}}{\text{Hasil tambah kekerapan}}$

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

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

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

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

14 Pythagoras Theorem / Teorem Pithagoras

$$c^2 = a^2 + b^2$$

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 = $2\pi rh$ / *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 = $(n - 2) \times 180^\circ$
- 12 $\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$ / $\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
- 13 $\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$ / $\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
- 14 Scale factor, $k = \frac{PA'}{PA}$ / *Faktor skala, $k = \frac{PA'}{PA}$*
- 15 Area of image = $k^2 \times \text{area of object}$ / *Luas imej = $k^2 \times \text{luas objek}$*

For
Examiner's
Use

1

Section A
Bahagian A
[52 marks]
[52 markah]

<http://cikguadura.wordpress.com/>

Answer **all** questions in this section

Jawab **semua** soalan dalam bahagian ini.

The Venn diagram in the answer space shows universal set ξ , P , Q and R such that the universal set, $\xi = P \cup Q \cup R$

Gambar rajah Venn di ruang jawapan menunjukkan set semesta ξ , P , Q dan R dengan keadaan set semesta, $\xi = P \cup Q \cup R$

On the diagram in the answer space, shade the set

Pada rajah di ruang jawapan, lorek set

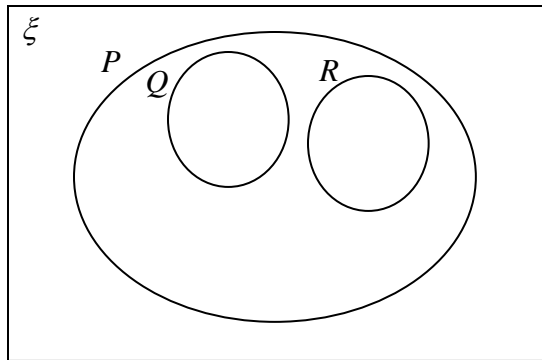
(a) $P \cap Q$

(b) $P \cap (Q \cup R)'$

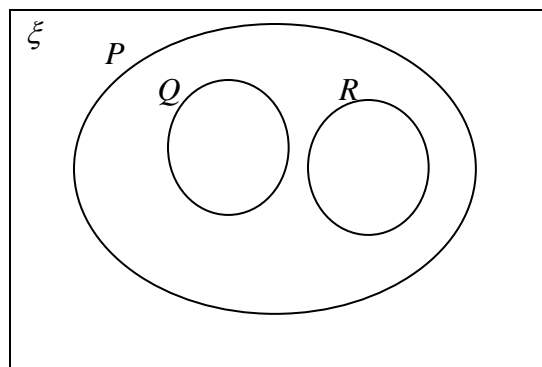
[3 marks]
[3 markah]

Answer/Jawapan:

(a)



(b)



- 2 Diagram 2 shows a right prism with a horizontal square base $PQRS$. Trapezium $PQUT$ is the uniform cross-section of the prism. The rectangular surface $QRVU$ is inclined.

Rajah 2 menunjukkan sebuah prisma tegak dengan tapak segiempat sama mengufuk $PQRS$. Trapezium $PQUT$ ialah keratan rentas seragam prisma itu. Permukaan segiempat tepat $QRVU$ adalah condong.

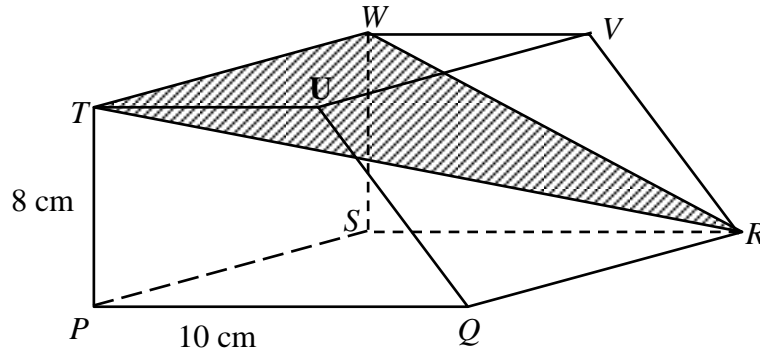


Diagram 2
Rajah 2

- (a) Name the angle between the plane TRW and the vertical plane $PSWT$.

Namakan sudut di antara satah TRW dengan satah mencancang $PSWT$.

- (b) Calculate the angle between the plane TRW and the vertical plane $PSWT$.

Hitung sudut di antara satah TRW dengan satah mencancang $PSWT$.

[3 marks]
[3 markah]

Answer / Jawapan:

(a)

(b)

For
Examiner's
Use

*For
Examiner's
Use*

- 3 Solve the following quadratic equation:

Selesaikan persamaan kuadratik berikut:

$$2k(k - 3) = 12 - 11k$$

[4 marks]
[4 markah]

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:

$$x - 4y = 8$$

$$3x + 2y = 17$$

[4 marks]
[4 markah]

Answer / Jawapan:

- 5 Diagram 5 shows a solid cylinder with diameter 14 cm and height 15 cm. A cone with height 5 cm is taken out of the solid.

Rajah 5 menunjukkan sebuah pepejal berbentuk silinder berdiameter 14 cm dan tinggi 15 cm. Sebuah kon dengan ketinggian 5 cm dikeluarkan daripada pepejal itu.

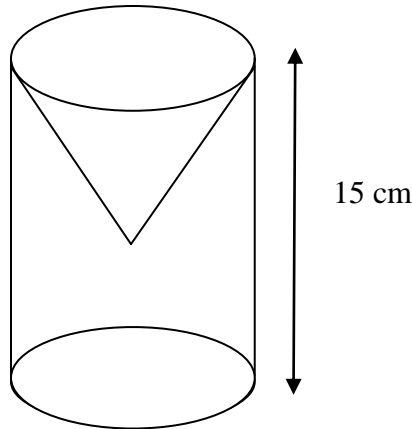


Diagram 5
Rajah 5

Calculate the volume, in cm^3 , of the remaining solid.

Hitungkan isi padu, dalam cm^3 , pepejal yang tinggal.

[Use / Gunakan $\pi = \frac{22}{7}$]

[4 marks]
[4 markah]

Answer/Jawapan:

For
Examiner's
Use

- 6 (a) State whether each of the following statements is **true** or **false**.
Nyatakan sama ada setiap pernyataan berikut adalah benar atau palsu.

(i) $5^2 = 10$ or /atau $\frac{5}{2} = 2.5$

(ii) $-5 \times -2 = 10$ and / dan $-5 > -2$

- (b) Write down Premise 2 to complete the following argument:
Tuliskan Premis 2 untuk melengkapkan hujah berikut:

Premise 1 : All multiples of 6 can be divided by 3.

Premis 1 : Semua gandaan 6 boleh dibahagi dengan 3.

Premise 2 :

Premis 2 :

Conclusion : 5 994 can be divide by 3.

Kesimpulan : 5 994 boleh dibahagi dengan 3.

- (c) Write down two implications based on the following compound statement:
Tulis dua implikasi berdasarkan pernyataan berikut:

$$m > n \text{ if and only if } m+1 > n+1$$

$$m > n \text{ jika dan hanya jika } m+1 > n+1$$

[5 marks]
[5 markah]

Answer / Jawapan:

(a) (i)

(ii)

(b) Premis 2 / Premis 2 :

(c) Implikasi 1 / Implication 1:

.....
Implikasi 2 / Implication 2:

.....

- 7 Diagram 7 shows a parallelogram $OPQR$ drawn on a Cartesian plane where O is the origin.

Rajah 7 menunjukkan sebuah segi empat selari $OPQR$ yang dilukis pada satah Cartesan di mana O ialah asalan.

*For
Examiner's
Use*

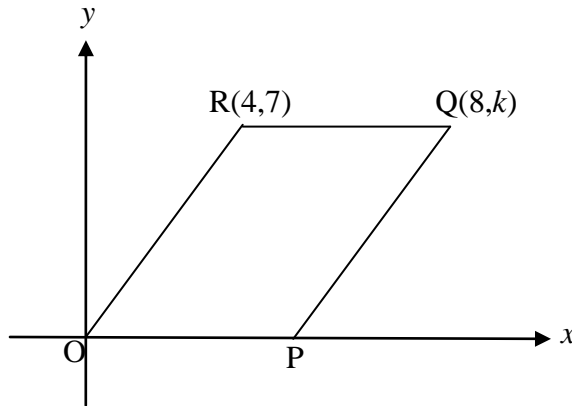


Diagram 7
Rajah 7

- (a) Find the value of k .

Cari nilai k .

- (b) Find the equation of the straight line PQ .

Cari persamaan bagi garis lurus PQ .

- (c) Find the x -intercept of the straight line PQ .

Cari pintasan- x bagi garis lurus PQ .

[5 marks]
[5 markah]

*For
Examiner's
Use*

Answer/Jawapan:

(a)

(b)

(c)

- 8 Diagram 8 shows three labeled cards in Box *R* and five labeled cards in Box *S*.

Rajah 8 menunjukkan tiga kad berlabel di Kotak R dan lima kad berlabel di Kotak S

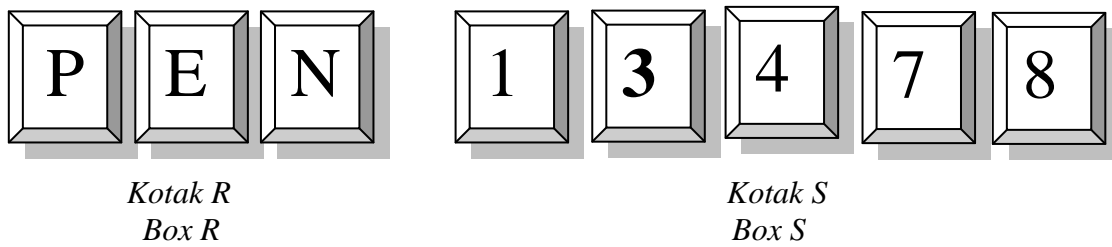


Diagram 8
Rajah 8

Two cards are picked at random, one card from Box *R* and another card from Box *S*.

Dua kad dipilih secara rawak, satu kad dari kotak R dan satu kad lagi dari Kotak S.

- (a) List the sample space.

Senaraikan ruang sampel.

- (b) List all the possible outcomes and find the probability of the events that the cards picked are labelled with

Senaraikan semua kesudahan peristiwa yang mungkin dan cari kebarangkalian bagi peristiwa tersebut bahawa kad- kad yang dipilih itu berlabel

- (i) a vocal or prime number,

huruf vokal atau nombor perdana,

- (ii) a consonant and an even number.

huruf konsonan dan nombor genap.

[5 marks]
[5 markah]

*For
Examiner's
Use*

*For
Examiner's
Use*

Answer/Jawapan:

(a)

(b) (i)

(ii)

- 9 Diagram 9 shows quadrant OPQ and sector ORS , with common centre O . OQR is a straight line.

Rajah 9 menunjukkan sukuan bulatan OPQ dan sector ORS , dengan pusat sepunya O . OQR ialah garis lurus.

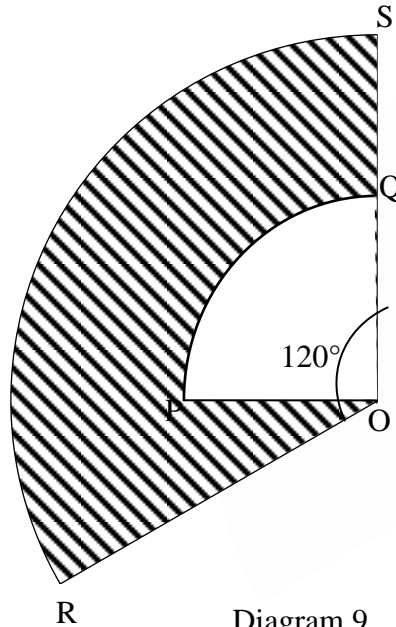


Diagram 9
Rajah 9

It is given $OS = 12$ cm and $OQ = QS$.

Diberi bahawa $OS = 12$ cm, $OQ = QS$.

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

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

- (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]

*For
Examiner's
Use*

*For
Examiner's
Use*

Answer/Jawapan:

(a)

(b)

- 10 Diagram 10 shows a speed-time graph for the movement of a particle for a period of 12 seconds.

Rajah 10 menunjukkan graf laju-masa bagi pergerakan suatu zarah dalam tempoh 12 saat.

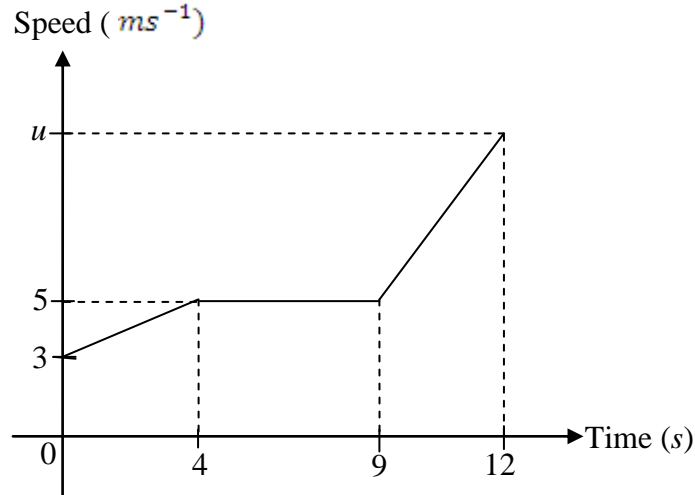


Diagram 10
Rajah 10

- (a) State the duration of time, in s, for which the particle moves with uniform speed.

Nyatakan tempoh masa, dalam s, zarah itu bergerak dengan laju seragam.

- (b) Calculate the distance travelled during the first 9 seconds.

Hitung jarak yang dilalui dalam 9 saat pertama.

- (c) Calculate the value of u if the rate of change of speed during the last 3 seconds is 2ms^{-2} .

Hitung nilai u jika kadar perubahan laju dalam 3 saat terakhir ialah 2ms^{-2} .

[6 marks]
[6 markah]

*For
Examiner's
Use*

*For
Examiner's
Use*

Answer/Jawapan:

(a)

(b)

(c)

11

a) It is given that $\frac{1}{n} \begin{pmatrix} 4 & 1 \\ -3 & 3 \end{pmatrix} \begin{pmatrix} 3 & -1 \\ 3 & m \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

Find the values of m and of n .

Diberi bahawa $\frac{1}{n} \begin{pmatrix} 4 & 1 \\ -3 & 3 \end{pmatrix} \begin{pmatrix} 3 & -1 \\ 3 & m \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

Carikan nilai m dan nilai n .

(b) Write the following simultaneous linear equations as a matrix equations:

Tulis persamaan linear serentak berikut dalam bentuk persamaan matriks:

$$3x - y = -21$$

$$3x + 4y = 9$$

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

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

[7 marks]

[7 markah]

Answer/Jawapan:

*For
Examiner's
Use*

For
Examiner's
Use

Section B
Bahagian B

[48 marks]

[48 markah]

<http://cikguadura.wordpress.com/>

Answer any **four** question from this section.

Jawab mana - mana **empat** soalan dalam bahagian ini.

- 12 (a) Complete Table 12 in the answer space for equations $y = -3x^2 - 5x + 6$ by writing down the value of y when $x = -1$ and $x = 2$. [2 marks]

Lengkapkan Jadual 12 di ruang jawapan bagi persamaan $y = -3x^2 - 5x + 6$ dengan menulis nilai-nilai y apabila $x = -1$ dan $x = 2$. [2 markah]

- (b) For the part of the questions, use the graph paper. You may use a flexible curve ruler. By using a scale of 2 cm to 1 units on the x -axis and 2 cm to 5 units on the y -axis, draw the graph of $y = -3x^2 - 5x + 6$ for $-3 \leq x \leq 3$. [4 marks]

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan pada halaman. Anda boleh menggunakan pembaris fleksibel. Dengan menggunakan skala 2 cm kepada 1 unit pada paksi- x dan 2 cm kepada 5 unit pada paksi- y , lukis graf untuk $y = -3x^2 - 5x + 6$ untuk $-3 \leq x \leq 3$. [4 markah]

- (c) From graph in 12(b), find

Dari graf di 2(b), cari

- (i) the value of y when $x = -1.5$

nilai y apabila $x = -1.5$

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

nilai x apabila $y = -15$

[2 marks]

[2 markah]

- (d) Draw a suitable straight line on the graph in 12(b) to find the value of x which satisfy the equations for $16 - 3x^2 = 0$ for $-3 \leq x \leq 3$. State the values of x . [4 marks]

Lukis satu garis lurus yang sesuai pada graf untuk mencari nilai-nilai x yang memuaskan persamaan $16 - 3x^2 = 0$ untuk $-3 \leq x \leq 3$. Nyatakan nilai-nilai x ini. [4 markah]

Answer/Jawapan:

(a)

x	-3	-2	-1	0	1	2	2.5	3
y	-6	4		6	-2		-25.3	-36

Table 12
Jadual 12

For
Examiner's
Use

(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:

$\dots\dots\dots$

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

For
Examiner's
Use

13

- (a) Diagram 13.1 shows points **Y** and **Z** drawn on a Cartesian plane.
Rajah menunjukkan titik Y dan titik Z dilukis pada suatu satah Cartesian.

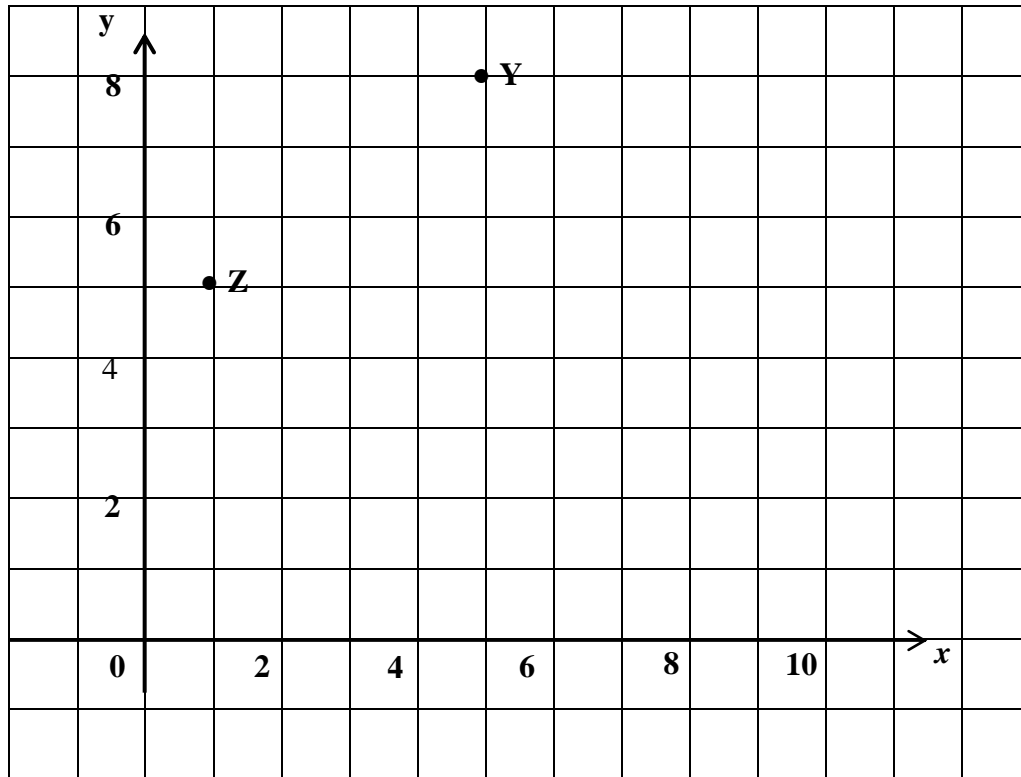


Diagram 13.1
Rajah 13.1

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

Transformation **R** is a clockwise rotation 90° about centre **Z**.
State the coordinates of image of point **Y** under the following transformations:

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

Penjelmaan R ialah satu putaran 90° mengikut jam pada pusat Z.
Nyatakan koordinat imej bagi titik Y di bawah penjelmaan berikut:

- (i) **R**
- (ii) **T²**
- (iii) **TR**

[5 marks]
[5 markah]

- (b) Diagram 13.2 shows three pentagons, ABCDE, APQRS and FGHIJ drawn on square grids.

Rajah 13.2 menunjukkan tiga pentagon ABCDE, APQRS dan FGHIJ dilukis pada grid segiempat sama.

*For
Examiner's
Use*

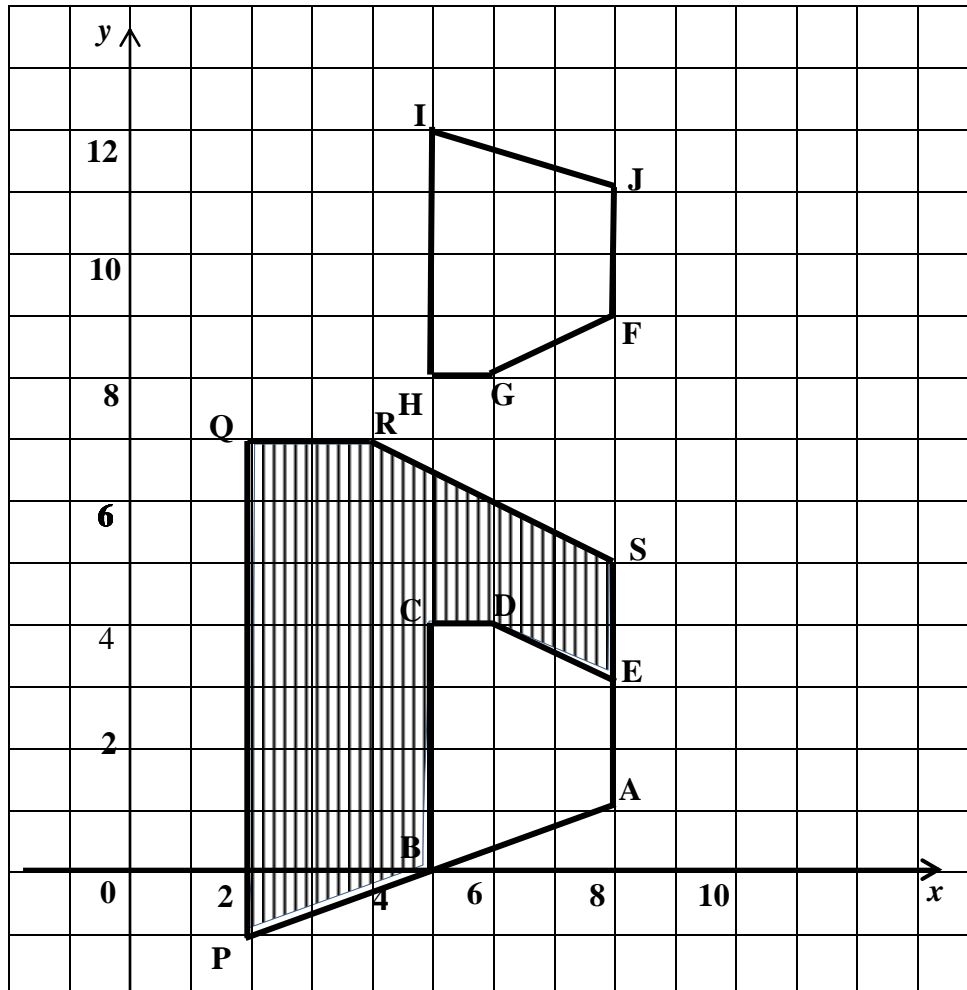


Diagram 13.2

Rajah 13.2

APQRS is the image of FGHIJ under combined transformation MN.
Describe in full, the transformation:

*APQRS adalah imej bagi FGHIJ di bawah gabungan penjelmaan MN.
Huraikan selengkapnya penjelmaan:*

- (i) N
- (ii) M

For
Examiner's
Use

(c) It is given that the area of the shaded region is 30 cm^2 .
Calculate the area, in cm^2 the pentagon FGHIJ.

*Diberi bahawa luas kawasan berlorek ialah 30 cm^2 .
Cari luas, dalam cm^2 pentagon FGHIJ.*

[7 marks]
[7 markah]

Answer/Jawapan:

(a) (i)

(ii)

(iii)

(b) (i)

(ii)

(c)

14 The data in Diagram 14 shows the prices, in RM, of 40 bags in a shop.

Data dalam Rajah 14 menunjukkan harga, dalam RM, bagi 40 beg di sebuah kedai.

75	45	63	70	61	36	57	53	84	48
60	52	64	56	54	63	74	47	72	62
71	62	72	66	89	65	75	57	23	45
85	54	34	75	70	40	30	69	67	99

Diagram 14
Rajah 14

(a) Using the data in Diagram 14, complete Table 14 in the answer space. [4 marks]

Dengan menggunakan data dalam Rajah 14, lengkapkan Jadual 14 di ruang jawapan. [4 markah]

(b) Calculate the estimated mean for the price of a bag. [3 marks]

Hitung min anggaran bagi harga sebuah beg. [3 markah]

(c) For the part of the question, use the graph paper. You may use a flexible ruler. Using a scale of 2 cm to RM 10 on the horizontal axis and 2 cm to 5 bags on the vertical axis, draw an ogive for the data. [4 marks]

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan. Anda boleh menggunakan pembaris fleksibel. Dengan menggunakan skala 2 cm kepada RM 10 pada paksi mengufuk dan 2 cm kepada 5 beg pada paksi mencancang, lukis ogif bagi data itu. [4 markah]

(d) From your ogive in 14(c), find the third quartile. [1 mark]

Daripada ogif anda di 14(c), cari kuartil ketiga. [1 markah]

*For
Examiner's
Use*

For
Examiner's
Use

14 Answer/Jawapan:

(a)

Class interval <i>Selang kelas</i>	Frequency <i>Kekerapan</i>	Cumulative frequency <i>Kekerapan longgokan</i>	Upper boundary <i>Sempadan atas</i>
10 – 19	0	0	19.5
20 – 29			
30 – 39			

(b)

(c) Refer graph.
Rujuk graf.

(d)

- 15 You are not allowed to use graph paper to answer this question.
Anda tidak dibenarkan menggunakan kertas graf untuk menjawab soalan ini.

- (a) Diagram 15.1 shows a solid right prism with rectangular base PQRS on a horizontal plane. The surface KPQEL is the uniform cross section of the prism. The rectangle KLMN is a horizontal plane and the rectangle EQRF is an inclined plane. KP and LE are vertical edges.

Rajah 15.1 menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segi empat tepat PQRS terletak pada satah mengufuk. Permukaan KPQEL ialah keratan rentas seragam prisma itu. Segi empat tepat KLMN ialah satah mengufuk dan segi empat tepat EQRF ialah satah condong. Tepi KP dan LE adalah tegak.

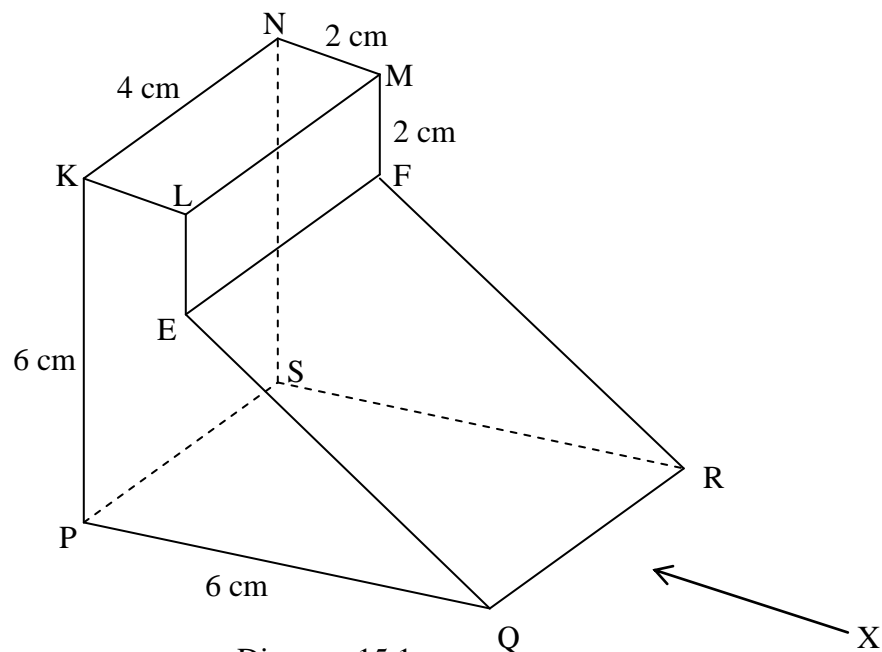


Diagram 15.1
Rajah 15.1

Draw to full scale, the elevation of the solid on a vertical plane parallel to QR as viewed from X

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

[3 marks]
 [3 markah]

*For
Examiner's
Use*

Answer/Jawapan:

(a)

For
Examiner's
Use

- (b) Another solid right prism with trapezium ABCD as the uniform cross section is joined to the prism in Diagram 15.1 at the vertical plane DCQP. The composite solid is as shown in Diagram 15.2. The base GHQRS lies on a horizontal plane AG and BH are vertical edges and $\angle BAD = \angle ADC = 90^\circ$

Sebuah pepejal lain berbentuk prisma tegak dengan trapezium sebagai keratan rentas seragamnya dicantum kepada prisma dalam Rajah 15.1 pada satah mencancang DCQP. Gabungan pepejal adalah seperti yang ditunjukkan dalam Rajah 15.2. Tapak GHQRS terletak pada satah mengufuk. Tepi AG dan BH adalah tegak dan $\angle BAD = \angle ADC = 90^\circ$

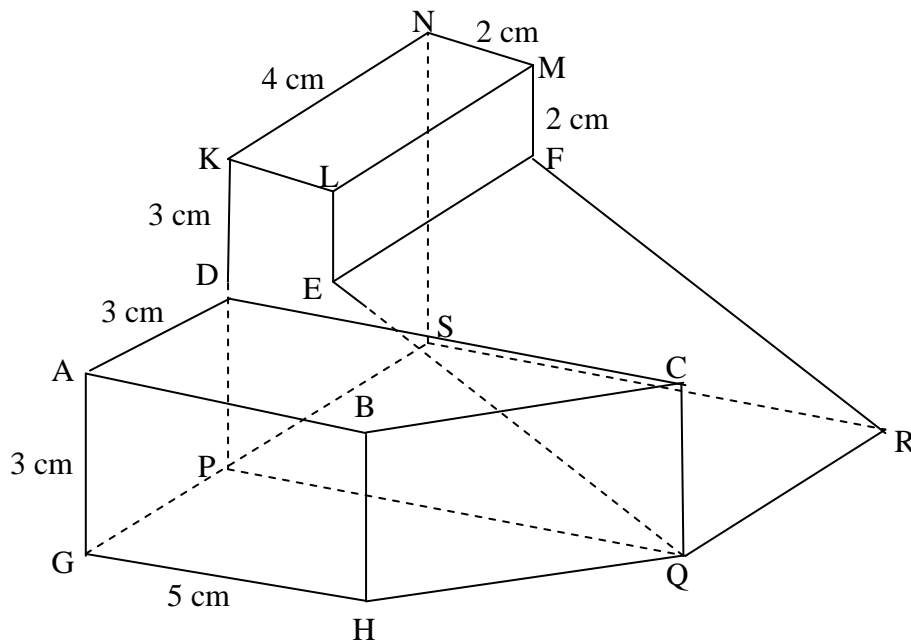
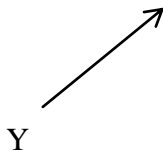


Diagram 15.2
Rajah 15.2



Draw to full scale,
Lukis dengan skala penuh,

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

*For
Examiner's
Use*

Answer/Jawapan:

(b)(i),(ii)

- 16 P (62° S, 15° E), Q(62° S, 75° E), R and V are four points on the surface of the earth. PR is the diameter of the parallel of latitude 62° S.

For
Examiner's
Use

P (62° S, 15° E), Q(62° S, 75° E), R dan V ialah empat titik di atas permukaan bumi. PR ialah diameter selarian latitud 62° S.

- (a) State the location of R, [2 marks]

Nyatakan kedudukan bagi R, [2 markah]

- (b) Calculate the shortest distance, in nautical miles, from P to R measured along the surface of the earth. [3 marks]

Hitung jarak terpendek, dalam batu nautika, dari P ke R diukur sepanjang permukaan bumi. [3 markah]

- (c) Calculate the distance, in nautical miles, from P due east to Q measured along the common parallel of latitude. [3 marks]

Hitung jarak, dalam batu nautika, dari P arah timur ke Q diukur sepanjang selarian latitud sepunya. [3 markah]

- (d) An aeroplane took off from Q and flew due north to V. The average speed of the flight is 630 knots and the time taken was $7\frac{1}{2}$ hours.

Sebuah kapal terbang berlepas dari Q arah ke utara ke V. Purata laju penerbangan itu ialah 630 knot dan masa yang diambil untuk penerbangan itu ialah $7\frac{1}{2}$ jam.

Calculate

Hitung

- (i) the distance, in nautical miles, from Q to V measured along the meridian, [2 marks]

jarak, dalam batu nautika, dari Q ke V diukur sepanjang meridian, [2 markah]

- (ii) the latitude of V. [2 marks]

latitud bagi V . [2 markah]

*For
Examiner's
Use*

Answer/Jawapan:

(a)

(b)

(c)

(d) (i)

(ii)

**END 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 any **four** questions from **Section B**.
*Jawab **semua** soalan dalam **Bahagian A** dan mana-mana **empat** soalan daripada **Bahagian B**.*
3. Write your answers in the spaces provided in the question paper.
Tulis jawapan anda pada ruang yang disediakan dalam kertas soalan ini.
4. Show your working. It may help you to get marks.
Tunjukkan 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.
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 3.
Satu senarai rumus disediakan di halaman 2 hingga 3.
9. A booklet of four-figure mathematical tables is provided.
Sebuah buku sifir matematik empat angka disediakan.
10. You may use a scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik.
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.

1449/2
Peraturan
Pemarkahan
Matematik
Kertas 1 & 2
Oktober
2014



KEMENTERIAN
PENDIDIKAN
MALAYSIA

<http://cikguadura.wordpress.com/>

**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PENDIDIKAN MALAYSIA**

**PENTAKSIRAN DIAGNOSTIK SBP 2014
PEPERIKSAAN PERCUBAAN SPM**

MATEMATIK

Kertas 1 & Kertas 2
<http://cikguadura.wordpress.com/>

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

AMARAN

Peraturan Pemarkahan ini **SULIT** dan **Hak Cipta Sekolah Berasrama Penuh**. Kegunaannya khusus untuk pemeriksa yang berkenaan sahaja. Sebarang maklumat dalam peraturan pemarkahan ini tidak boleh dimaklumkan kepada sesiapa. Peraturan Pemarkahan ini juga tidak boleh dikeluarkan dalam apa jua bentuk penulisan dan percetakan.

Peraturan Pemarkahan ini mengandungi 11 halaman bercetak

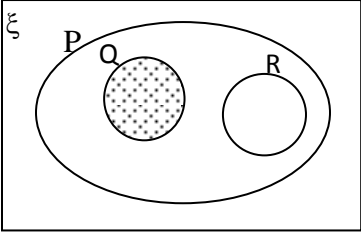
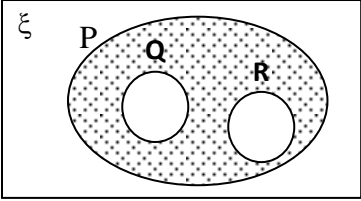
KERTAS 1

<http://cikguadura.wordpress.com/>

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

KERTAS 2

<http://cikguadura.wordpress.com/>

Q	SOLUTION AND MARK SCHEME	MARKS	
1(a)		P1	
(b)			
2 (a)	Identify $\angle RWS$ or $\angle SWR$	P1	
(b)	$\tan \angle RWS = \frac{10}{8}$ equivalent 51.3° or $51^\circ 20'$	K1	
3	$2k^2 + 5k - 12 = 0$ $(2k - 3)(k + 4) = 0$ $k = \frac{3}{2}, -4$	K1	
4	$6x + 4y = 34$ or equivalent $7x = 42$ or equivalent $x = 6, y = -\frac{1}{2}$	K1	
5	Volume of cylinder : $\frac{22}{7} \times 7 \times 7 \times 15$ Volume of cone : $\frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 5$ $2310 - 256\frac{2}{3}$ $2053\frac{1}{3}$	K1	4

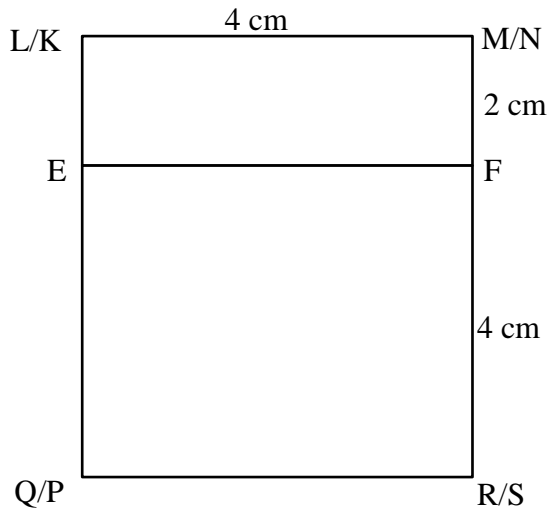
6(a)	(i) True (ii) False	P1 P1	5
(b)	Premis 2 : 5 994 is multiple of 6	P1	
(c)	Implication 1: If $m > n$, then $m+1 > n+1$ Implication 2: If $m+1 > n+1$, then $m > n$	P1 P1	
7(a)	(a) $k = 7$	P1	7
(b)	(b) $m_{PQ} = m_{OR} : \frac{7-0}{4-0} = \frac{7}{4}$ $y = \frac{7}{4}x - 7 @ 4y = 7x - 28$	P1 N1	
(c)	(c) $4(0) = 7x - 28$ x -intercept = 4	P1 N1	
8 (a)	$S = \{ (P,1), (P,3), (P,4), (P,7), (P,8), (E,1), (E,3), (E,4), (E,7), (E,8), (N, 1), (N,3), (N,4), (N,7), (N,8) \}$	P1	5
(b)(i)	$\{(E, 1)(E, 3)(E, 4)(E, 7)(E, 8)(P, 3)(P, 7)(N, 3)(N, 7)\}$	K1	
	$\frac{9}{15} = \frac{3}{5}$	N1	
(ii)	$\{(P,4), (P,8), (N,4), (N,8) \}$ $\frac{4}{15}$	K1 N1	
9(a)	$\frac{120}{360} \times 2 \times \frac{22}{7} \times 12$ or $\frac{90}{360} \times 2 \times \frac{22}{7} \times 6$ $25\frac{1}{7} + 6 + 9\frac{3}{7} + 6 + 12$ $58\frac{4}{7}$	K1 K1 N1	6
(b)	$\frac{120}{360} \times \frac{22}{7} \times 12 \times 12$ or $\frac{90}{360} \times \frac{22}{7} \times 6 \times 6$ $150\frac{6}{7} - 28\frac{2}{7}$ $122\frac{4}{7}$	K1 K1 N1	

10(a)	5	P1	
(b)	$\frac{1}{2} \times (3 + 5) \times 4$ or (5×5) $16 + 25$ 41 m	K1 K1 N1	
(c)	$\frac{u - 5}{12 - 9} = 2$ $u = 11$	K1 N1	6
11(a)	$n = 15$ $m = 4$	P1 P1	
(b)	$\begin{pmatrix} 3 & -1 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -21 \\ 9 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{15} \begin{pmatrix} 4 & 1 \\ -3 & 3 \end{pmatrix} \begin{pmatrix} -21 \\ 9 \end{pmatrix}$ $= \frac{1}{15} \begin{pmatrix} -75 \\ 90 \end{pmatrix}$ $= \begin{pmatrix} -5 \\ 6 \end{pmatrix}$ $x = -5$ $y = 6$	K1 K1 K1 N1 N1	7

12(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td style="text-align: center;">x</td> <td style="text-align: center;">-1</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">y</td> <td style="text-align: center;">8</td> <td style="text-align: center;">-16</td> </tr> </tbody> </table>	x	-1	2	y	8	-16	P1 P1	
x	-1	2							
y	8	-16							
(b)	<p>Graph:</p> <p>Axes drawn in correct directions , uniform scale in $-3 \leq x \leq 3$</p> <p>All 6 point and any *2 point correctly plotted or curve passes through these point $-3 \leq x \leq 3$.</p> <p>A smooth and continuous curve without any straight line and passes through all 9 correct points using the given scale for $-3 \leq x \leq 3$</p> <p>Note: 1) 6 or 7 point correctly plotted, awarded K1</p> <p style="padding-left: 40px;">2) Ignore curve out of range.</p> <p style="padding-left: 40px;">$y = 7 \pm 0.5$ $x = 1.9 \pm 0.1$</p>	P1 K2 N1 P1 P1							
(c)	<p>Identify equation $y = -5x - 10$</p> <p>Straight line $y = -5x - 10$ correctly drawn</p>	K1 K1							
(d)	<p style="padding-left: 40px;">$x = 2.3 \pm 0.1$ $= -2.3 \pm 0.1$</p>	N1 N1	12						
13(a)	<p>(i) (4 , 1)</p> <p>(ii) (13, 4)</p> <p>(iii) (7 , -1)</p> <p>Note: award</p> <p style="padding-left: 20px;">(ii) (10,6) P1</p> <p style="padding-left: 20px;">(iii) (4,1) P1</p>	P1 P2 P2							
(b)	<p>N: Reflection at $y = 6$</p> <p>Note : Reflection award P1</p> <p>M: Enlargement at point A (8,1) with scale factor 2</p> <p>Note: (i) Enlargement with scale factor 2 award P2</p> <p style="padding-left: 40px;">(ii) Enlargement at point A award P2</p> <p style="padding-left: 40px;">(iii) Enlargement award P1</p>	P2 P3							

(c)	<p>Area of shaded region = 30</p> <p>Area of shaded region + area of object = 2^2 (area object) $30 + \text{area of object} = 4$ (area of object) $3(\text{area of object}) = 30$ Area of object = 10</p> <p>Area of pentagon FGHIJ = 10 cm^2</p>	K1																																									
14 (a)	<table border="1" data-bbox="318 520 1334 1012"> <thead> <tr> <th>Class interval <i>Selang kelas</i></th> <th>Frequency <i>Kekerapan</i></th> <th>Cumulative frequency <i>Kekerapan longgokan</i></th> <th>Upper boundary <i>Sempadan atas</i></th> </tr> </thead> <tbody> <tr><td>10 - 19</td><td>0</td><td>0</td><td>19.5</td></tr> <tr><td>20 - 29</td><td>1</td><td>1</td><td>29.5</td></tr> <tr><td>30 - 39</td><td>3</td><td>4</td><td>39.5</td></tr> <tr><td>40 - 49</td><td>5</td><td>9</td><td>49.5</td></tr> <tr><td>50 - 59</td><td>7</td><td>16</td><td>59.5</td></tr> <tr><td>60 - 69</td><td>11</td><td>27</td><td>69.5</td></tr> <tr><td>70 - 79</td><td>9</td><td>36</td><td>79.5</td></tr> <tr><td>80 - 89</td><td>3</td><td>39</td><td>89.5</td></tr> <tr><td>90 - 99</td><td>1</td><td>40</td><td>99.5</td></tr> </tbody> </table> <p>Class interval Frequency Cumulative frequency Upper boundary</p> <p>(b)</p> <p>Axes drawn in correct direction. Uniform scales for $19.5 \leq x \leq 99.5$ and $0 \leq y \leq 40$.</p> <p>*8 points correctly plotted Note : 6 or 7 points correctly plotted, award K1</p> <p>(c)</p> <p>Smooth and continuous curve without any straight line passes through all 8 correct points for $19.5 \leq x \leq 99.5$.</p> $\text{Mean} = \frac{1(24.5) + 3(34.5) + 5(44.5) + 7(54.5) + 11(64.5) + 9(74.5) + 3(84.5) + 1(94.5)}{40}$ $= \frac{2460}{40}$ $= \text{RM}61.50$ <p>Note : Allow two mistakes in midpoint for K1</p> <p>(d)</p> $\frac{3}{4} \times 40 = 30$ <p>Third quartile = RM71.50</p>	Class interval <i>Selang kelas</i>	Frequency <i>Kekerapan</i>	Cumulative frequency <i>Kekerapan longgokan</i>	Upper boundary <i>Sempadan atas</i>	10 - 19	0	0	19.5	20 - 29	1	1	29.5	30 - 39	3	4	39.5	40 - 49	5	9	49.5	50 - 59	7	16	59.5	60 - 69	11	27	69.5	70 - 79	9	36	79.5	80 - 89	3	39	89.5	90 - 99	1	40	99.5	P1 P1 P1 P1 P1 K2 N1 K2 N1	12
Class interval <i>Selang kelas</i>	Frequency <i>Kekerapan</i>	Cumulative frequency <i>Kekerapan longgokan</i>	Upper boundary <i>Sempadan atas</i>																																								
10 - 19	0	0	19.5																																								
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40 - 49	5	9	49.5																																								
50 - 59	7	16	59.5																																								
60 - 69	11	27	69.5																																								
70 - 79	9	36	79.5																																								
80 - 89	3	39	89.5																																								
90 - 99	1	40	99.5																																								

15(a)



Correct shape of two rectangles

$$LE = MF < EP = FR < LM = QR$$

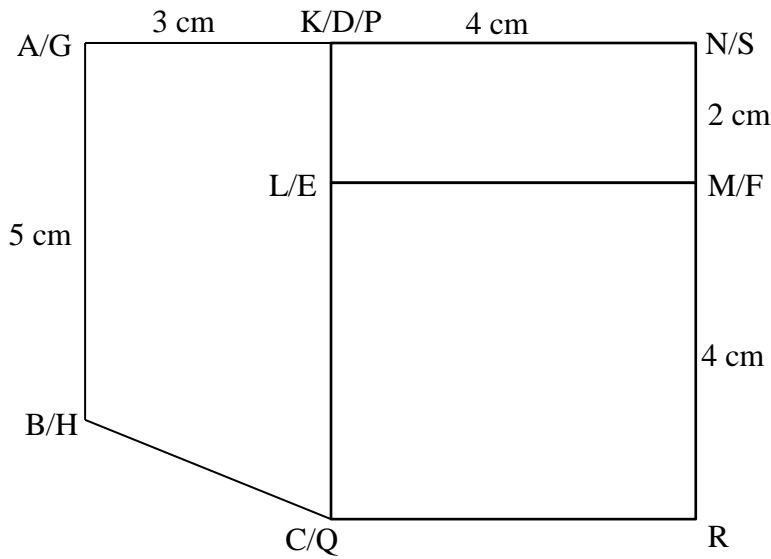
Correct measurement ± 0.2 cm (one way) and all angles at the vertices of rectangles = $90^\circ \pm 1^\circ$

K1

K1

N1

(b)(i)



Correct shape of two rectangles and one trapezium

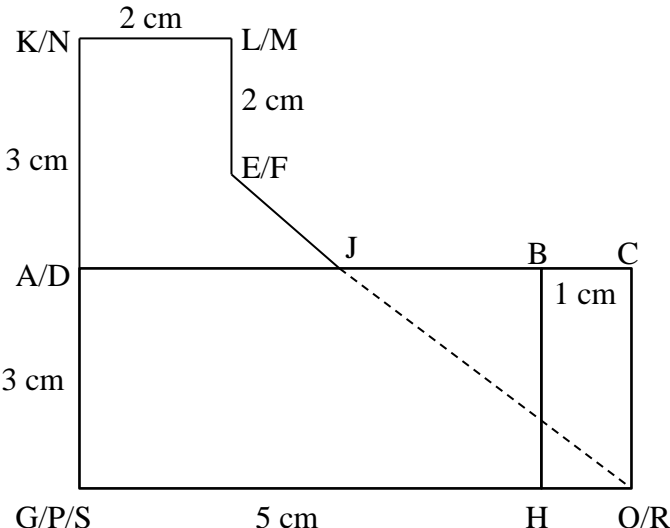
$$AB < KQ = NR$$

Correct measurement ± 0.2 cm (one way) and all angles at the vertices of rectangles = $90^\circ \pm 1^\circ$

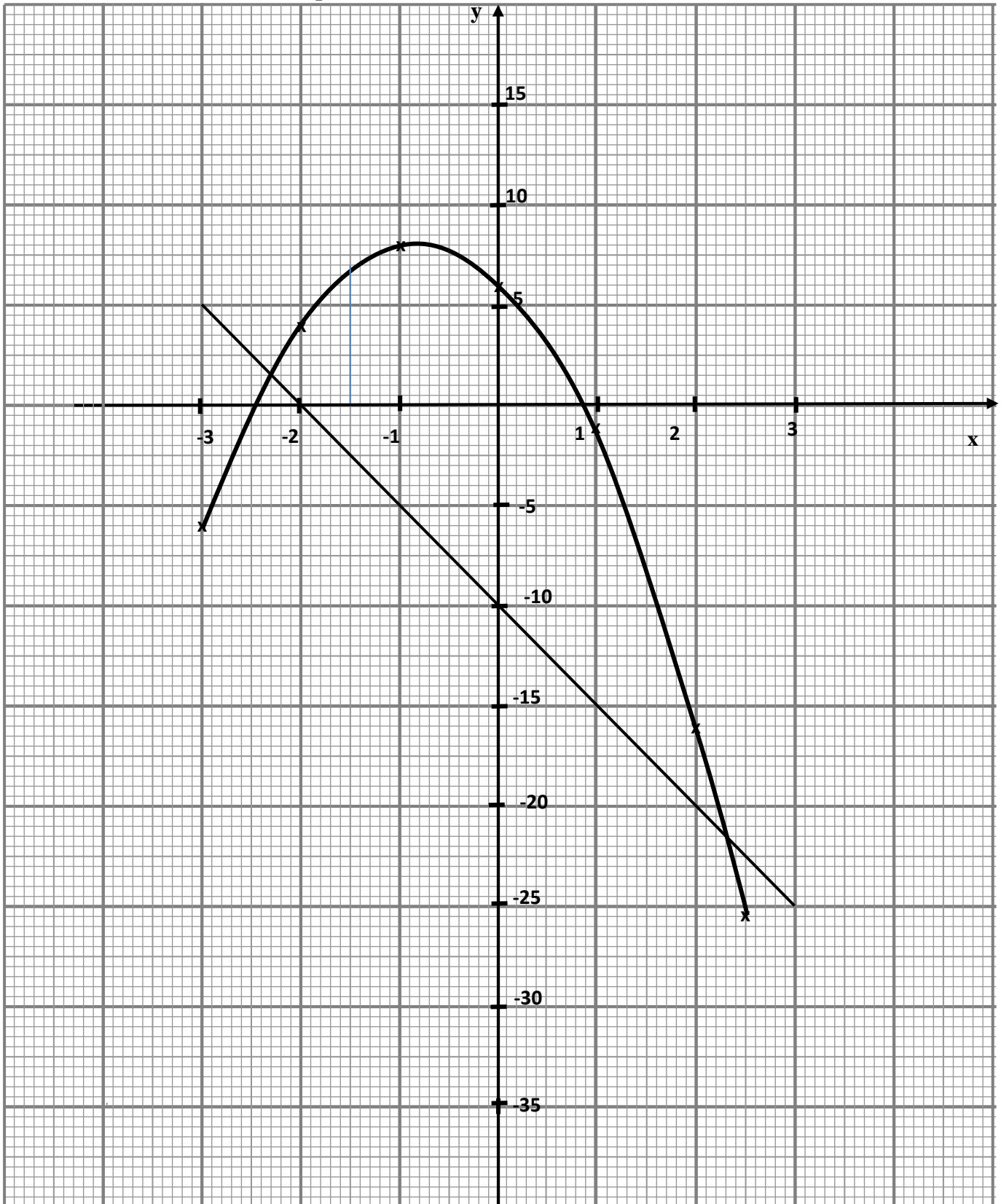
K1

K1

N2

(ii)	 <p>Correct shape of two hexagons Dotted line $LE < KA = DP$ Measurements correct to ± 0.2 cm (one way) and all angles at the vertices of rectangles = $90^\circ \pm 1^\circ$</p>	K1 K1 K1 N2	12
16(a)	<p>Longitude of R = $(180 - 15)^\circ$ W Location of R = $(62^\circ$ S, 165° W)</p> <p>(b) Shortest distance = $(180 - 2 \times 62) \times 60$ = 56×60 = 3360 nautical miles</p> <p>(c) Distance from P to Q = $(75 - 15) \times 60 \times \cos 62^\circ$ = $60 \times 60 \times \cos 62^\circ$ = 1690.1 nautical miles</p> <p>(d)(i) Distance from Q to V = speed \times time = $630 \times 7 \frac{1}{2}$ = 4725 nautical miles</p> <p>(ii) $\theta = \frac{4725}{60} = 78.75^\circ$ Latitude of V = $(78.75 - 62)^\circ$ = 16.75° N or $16^\circ 45'$ N</p>	P1 P1 K1 K1 N1 K1 K1 N1 K1 N1 K1 N1	12

Graph for Question 12/ Graf untuk soalan 12



Graph for Question 14/ Graf untuk soalan 14

