BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH
DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PELAJARAN MALAYSIA

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2012

PERCUBAAN SIJIL PELAJARAN MALAYSIA

MATHEMATICS

Kertas 1

1 $\frac{1}{4}$ JAM

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

Arahan:

1. *Kertas soalan ini mengandungi* **40** *soalan*.

2. *Jawab* **semua** *soalan.*

3. *Tiap-tiap soalan diikuti oleh empat pilihan jawapan iaitu* **A, B, C** *dan* **D.** *Bagi tiap-tiap soalan, pilih* **satu** *jawapan sahaja.* **Hitamkan** *jawapan anda pada kertas jawapan objektif yang disediakan.*

Kertas soalan ini mengandungi 25 halaman bercetak

MATHEMATICAL FORMULAE

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

RELATIONS

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

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

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

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

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

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

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

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

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

10 Pythagoras Theorem

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

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

SHAPES AND SPACE

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

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

3 Area of circle = πr^2

4 Curved surface area of cylinder = $2\pi rh$

5 Surface area of sphere = $4\pi r^2$

6 Volume of right prism = cross sectional area × length

7 Volume of cylinder = $\pi r^2 h$

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

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

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

11 Sum of interior angles of a polygon = $(n-2) \times 180^\circ$

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

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

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

15 Area of image = k^2 × area of object

1 Express 0.000576 in standard form.
Ungkapkan 0.000576 dalam bentuk piawai.

A 5.76×10^{4}

B 5.76×10^{2}

C 5.76×10^{-4}

D 5.76×10^{-6}

2 Round off 62.19 correct to three significant figures.
Bundarkan 62.19 betul kepada tiga angka bererti.

A 62.0

B 62.1

C 62.2

D 63.0

3 $6.5 \times 10^{-4} - 6.81 \times 10^{-5}$

A 5.819×10^{-5}

B 5.819×10^{-4}

C 5.189×10^{-4}

D 5.189×10^{-5}

4

$$\frac{0.02163 \times 3.428}{\sqrt{6.2 \times 10^{-3}}} =$$

A 2.978×10^{2}

B 1.196×10^{-4}

C 2.978×10^{-4}

D 9.417×10^{-1}

5 What is the value of the digit 4, in base ten, in the number 1403_5?
Apakah nilai bagi digit 4*, dalam asas sepuluh, dalam nombor* 1403_5?

A 16

B 75

C 100

D 125

6 $10111_2 + 10_2 =$

A 11001_2

B 10101_2

C 11011_2

D 11100_2

7 Diagram 7 shows a pentagon *PQRST*. Straight line *RS* is parallel to straight line *UPT*.
Rajah 7 *menunjukkan sebuah pentagon PQRST. Garis lurus RS adalah selari dengan garis lurus UPT.*

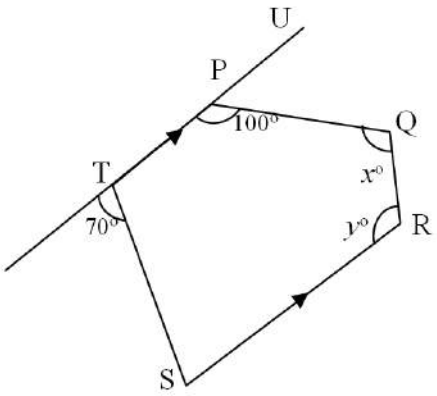


Diagram 7
Rajah 7

Find the value of $x + y$.
Carikan nilai $x + y$.

A 216

B 222

C 250

D 260

8 In Diagram 8, *TPS* is a tangent to the circle *PQR* at *P*. The length of arc *PR* is equal to the length of arc *QR*.
Dalam rajah 8*, TPS ialah tangen kepada bulatan PQR di P. Panjang lengkok PR adalah sama panjang lengkok QR.*

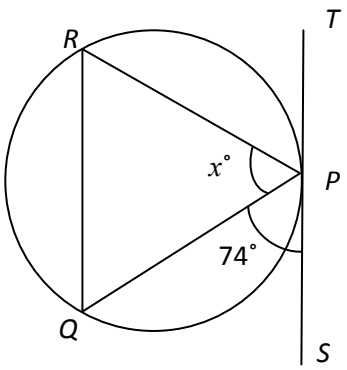


Diagram 8
Rajah 8

Find the value of *x*.
Carikan nilai x.

A 28

B 32

C 36

D 53

9 Diagram 9 shows points plotted on a Cartesian plane.
Rajah 9 menunjukkan beberapa titik pada suatu satah Cartesan.

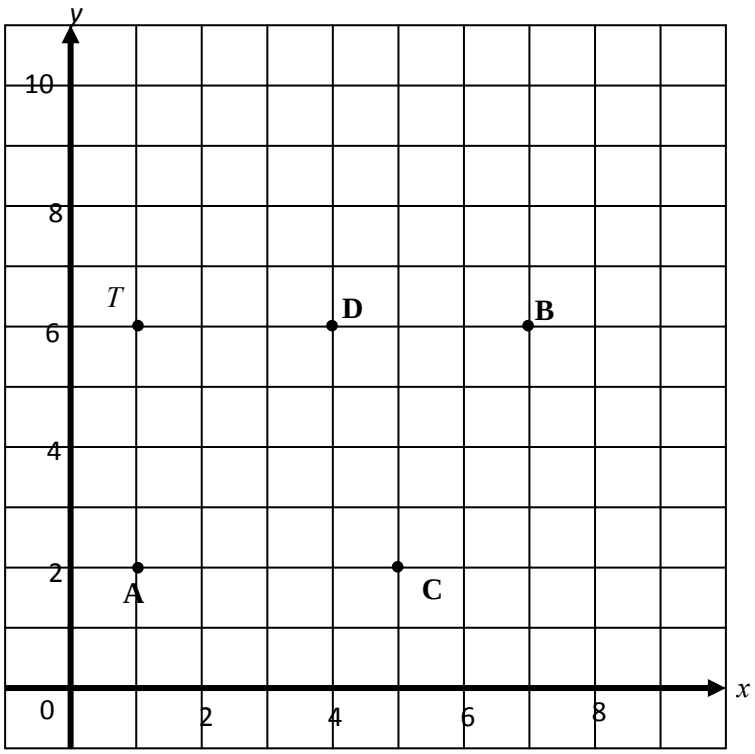


Diagram 9
Rajah 9

Which of the point **A**, **B**, **C** or **D** , is the image of point *T* under a reflection on the line $x = 4$.
Antara titik **A**, **B**, **C** atau **D,** *yang manakah imej bagi titik T di bawah pantulan pada garis* $x = 4$.

10 In Diagram 6, pentagon $P'\ Q'\ R'\ S'\ T'$ is the image of pentagon $PQRST$ under an enlargement at centre O.
Dalam Rajah 6,*pentagon* $P'\ Q'\ R'\ S'\ T'$ *ialah imej bagi pentagon PQRST di bawah satu pembesaran pada pusat O..*

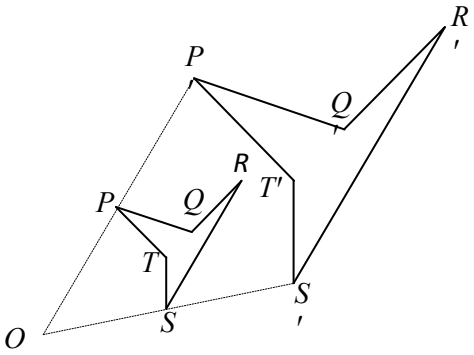


Diagram 10
Rajah 10

It is given that $PT = 4$ cm and $P'\ T'\ = 8$ cm and the area of $P'\ Q'\ R'\ S'\ T'$ is 64 cm^2. Find the area in cm^2, of $PQRST$.
Diberi bahawa $PT = 4$ *cm dan* $P'T' = 8$ *cm, dan luas* $P'\ Q'\ R'\ S'\ T'$ *ialah* 64 *cm*^{2}.
Carikan luas, dalam cm^2, *PQRST.*

A 256

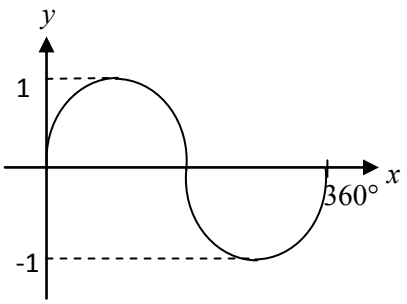
B 64

C 16

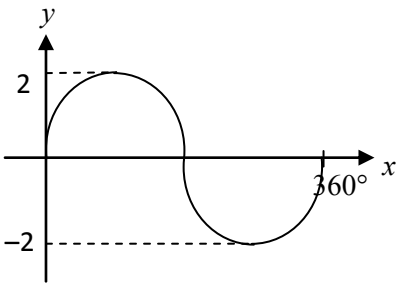
D 8

11 Which of the following graphs represent $y = 2\sin x$?
Antara berikut, yang manakah mewakili graf $y = 2\sin x$?

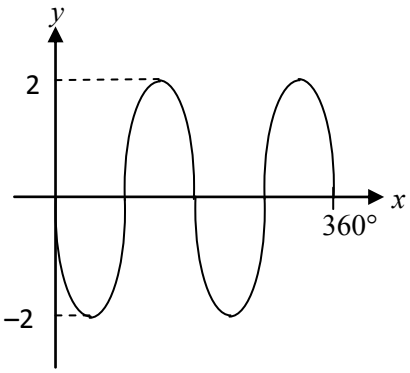
A



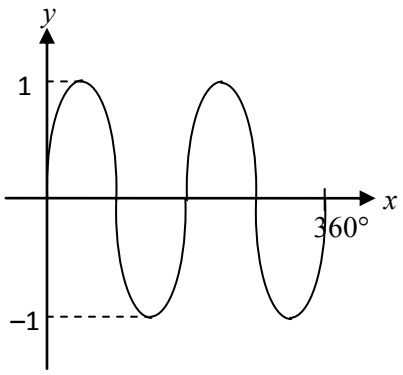
B



C



D



12 Diagram 12 shows two triangles *BDA* and *BEA*. *CBA* is a straight line and *BD* = 100 cm.
Dalam Rajah 12*, menunjukkan dua segitiga BDA and BEA. CBA adalah garis lurus dan BD* = 100 cm..

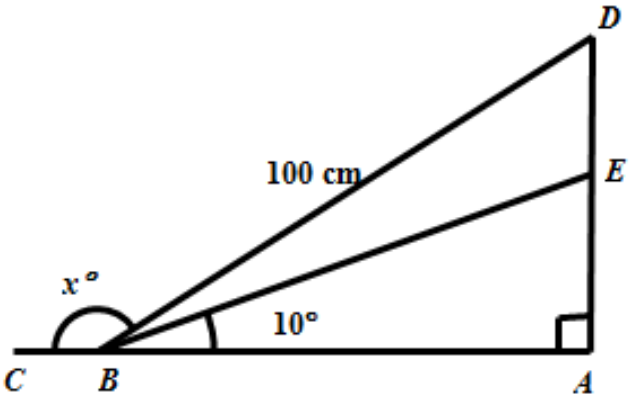


Diagram 12
Rajah 12

ABC is a straight line and cos $x = -0.9063$.
Find the length,in cm, of *AE*.
ABC ialah garis lurus dan kos $x = -0.9063$.
Cari panjang , dalam cm*, AE.*

A 15.98
B 42.26
C 56.71
D 90.63

13 Diagram 13 shows the graph of $y = \cos x$.
Rajah 13 *menunjukkan graf* $y = \text{kos } x$.

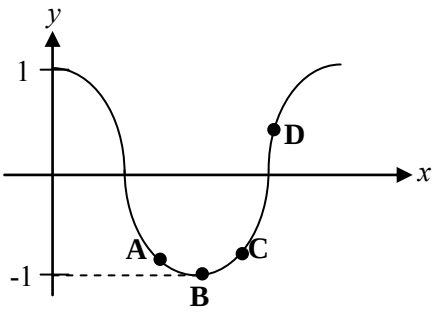


Diagram 13
Rajah 13

Which of the points **A**, **B**, **C** and **D** represent the points (210°, –0.866)

14 Diagram 14 shows a cuboid with a square base *PQRS*.
Rajah 14 *menunjukkan kuboid dengan tapak segi empat sama PQRS.*

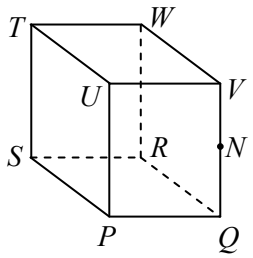


Diagram 14
Rajah 14

N is the midpoint of *VQ*.
Name the angle between the line *TN* and the plane *TUVW*?
N ialah titik tengah VQ.
Namakan sudut antara garis TN dengan satah TUVW?

A $\angle NTU$

B $\angle NVT$

C $\angle NTW$

D $\angle NTV$

15 In Diagram 15, find the angle of depression of point *R* from point *P*.
Dalam Rajah 15*, carikan sudut tunduk titik R dari titik P.*

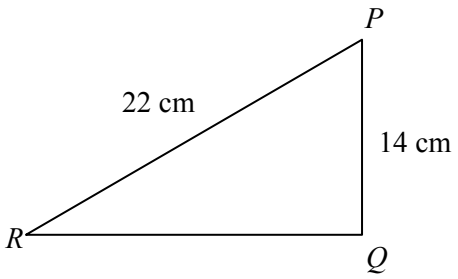


Diagram 15
Rajah 15

A 39° 31°

B 47°12°

C 50°28°

D 53°54°

16 Leela is looking to the school flag at the top of a pole. The angle of elevation of Leela's eye to the top of the pole is 35°. If the height of the pole and Leela's eye from horizontal ground is 30 m and 1.6 m respectively.
Find the distance between Leela and the pole.
Leela sedang memerhatikan bendera sekolah di puncak tiang. Sudut dongakan puncak tiang bendera dari mata Leela ialah 35°. Jika tinggi tiang bendera dan paras mata Leela dari tanah mengufuk masing-masing 30 m dan 1.6 *m.*
Cari jarak Leela dari tiang bendera itu.

A 19.89 m

B 21.01 m

C 40.56 m

D 42.84 m

17 In Diagram 17, *SPT* is a tangent to the circle centre *O*, at point *P*.
Dalam Rajah 17, *SPT ialah tangen kepada bulatan berpusat O, di titik P.*

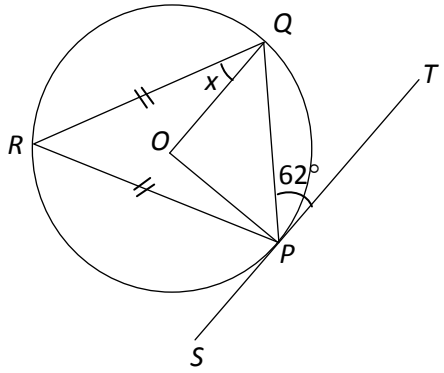


Diagram 17
Rajah 17

Find the value of *x*.
Cari nilai x.

A 28°

B 31°

C 56°

D 59°

18 In Diagram 18, *N* is the North Pole, *S* is the South Pole and *NOS* is the axis of the earth. *PLQ* is the Equator and *NRPS* is Greenwich Meridian.
Dalam Rajah 18, *U ialah Kutub Utara, S ialah Kutub Selatan dan UOS ialah paksi bumi. PLQ ialah Khatulistiwa dan NRPS ialah Meridian Greenwich.*

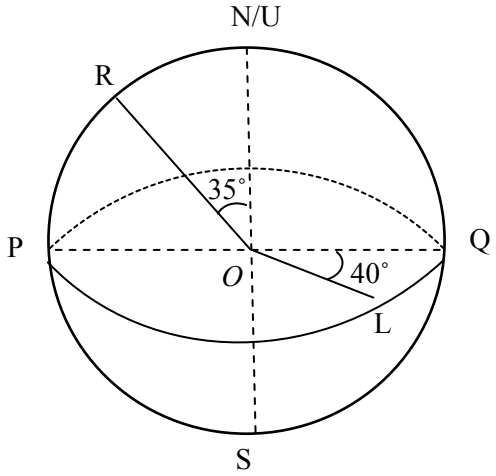


Diagram 18
Rajah 18

The position of *R* is
Kedudukan R ialah

A (35° N/U, 40° W/B)

B (35° N/U, 0°)

C (55° N/U, 0°)

D (55°N/U, 140° E/T)

19 $(3a-b)^2-4a(a+b)=$

A $2a^2-10ab+b^2$

B $2a^2-2ab+b^2$

C $5a^2-10ab+b^2$

D $5a^2-2ab-b^2$

20 Express $\frac{2s-3}{2s}+\frac{3s-1}{4}$ as a single fraction in it's simplest form.

Ungkapkan $\frac{2s-3}{2s}+\frac{3s-1}{4}$ *sebagai satu pecahan tunggal dalam bentuk termudah.*

A $\frac{s^2+s-2}{2s}$

B $\frac{3(s^2+s-2)}{4s}$

C $\frac{3s^2+5s-6}{4s}$

D $\frac{3s^2+7s-12}{4s}$

21 Given that $\frac{p-2q}{p+2}=3q$, express q in terms of p.

Diberi $\frac{p-2q}{p+2}=3q$, *ungkapkan q dalam sebutan p.*

A $\frac{p}{3p+4}$

B $\frac{p-2}{8+3p}$

C $\frac{p-2}{2+3p}$

D $\frac{p}{3p+8}$

22 Given $\frac{k+1}{1-k}=\frac{3}{7}$, calculate the value of k.

Diberi $\frac{k+1}{1-k}=\frac{3}{7}$, *hitung nilai* k.

A $\frac{2}{5}$

B $\frac{1}{5}$

C $-\frac{1}{2}$

D $-\frac{2}{5}$

23 $\left(\frac{1}{3}\right)^{\frac{5}{2}} =$

A $\sqrt[5]{3^2}$

B $\sqrt{3^5}$

C $\sqrt{\left(\frac{1}{3}\right)^5}$

D $\sqrt[5]{\left(\frac{1}{3}\right)^2}$

24 Simplify:
Ringkaskan:

$$\frac{\left(8\,m^{-3}n^{2}\right)^{\frac{2}{3}}}{m^{2}n^{-\frac{1}{3}}}$$

A $4m^{-4}n^{\frac{5}{3}}$

B $4m^{-5}n$

C $16m^{-5}n^{-1}$

D $16m^{-4}n^{\frac{5}{3}}$

25 List all the integers x which satisfy both inequalities $\frac{2x-4}{5} < x$ and $2x+12 \geq 5x$.

Senaraikan semua integer x yang memuaskan kedua-dua ketaksamaan $\frac{2x-4}{5} < x$ *dan* $2x+12 \geq 5x$.

A $-1, 0, 1, 2, 3, 4$

B $-1, 0, 1, 2, 3$

C $0, 1, 2, 3, 4$

D $0, 1, 2$

26 Diagram 26 is a bar chart showing the number of medals obtained by a Sekolah Seri Aman in a sport championship in the year 2010.
Rajah 26 ialah carta palang yang menunjukkan bilangan pingat yang dimenangi oleh Sekolah Seri Aman dalam kejohanan sukan pada tahun 2010.

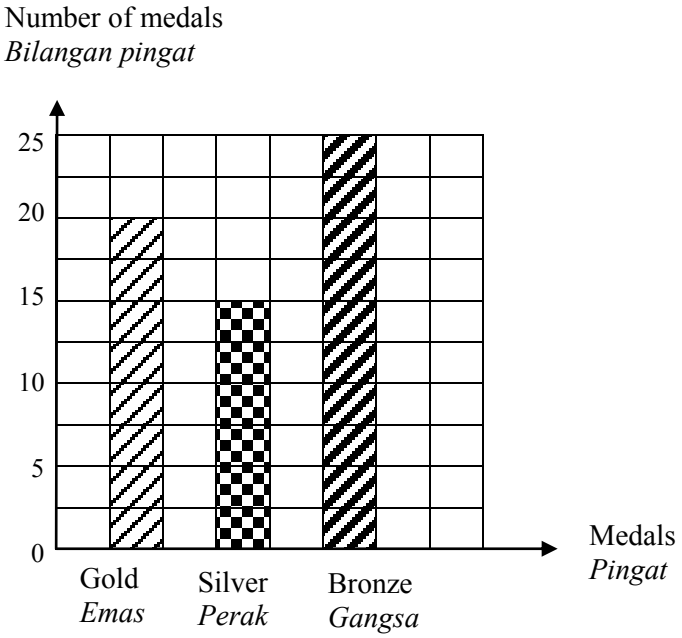


Diagram 26
Rajah 26

If pie chart is drawn to represent the given information, calculate the angle sector which represent the bronze medal.
Jika satu carta pai dilukis untuk mewakili maklumat yang diberi, hitung sudut sektor yang mewakili pingat gangsa.

A 180˚

B 140˚

C 150˚

D 160˚

27 Table 27 shows the scores of a group of pupils in a Physics quiz.
Jadual 27 menunjukkan skor yang diperolehi oleh sekumpulan pelajar dalam satu kuiz Fizik.

Score/ *Skor*	0	1	2	3
Number of students *Bilangan pelajar*	3	2	4	1

Table 27
Jadual 27

The mode of the score is
Skor mod ialah

A 1.3

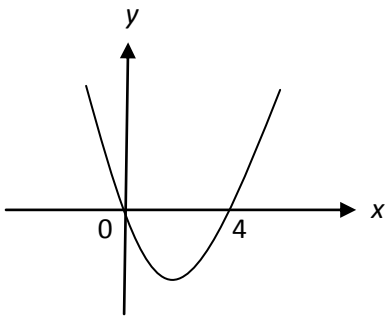
B 1.5

C 2

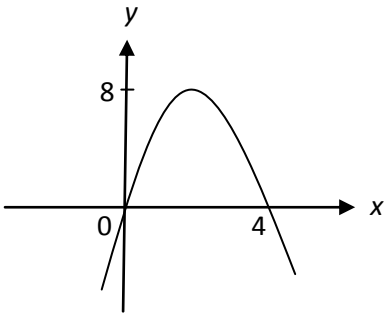
D 4

28 Which of the following graphs represents $y = 8 - 2x^2$?
Graf manakah yang mewakili $y = 8 - 2x^2$ *?*

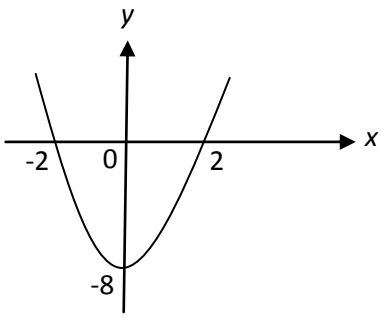
A



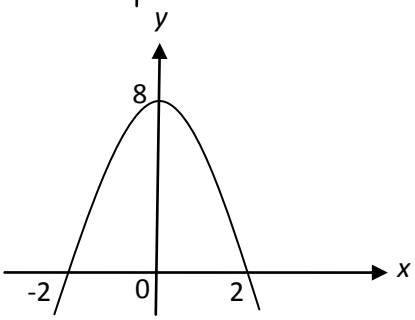
B



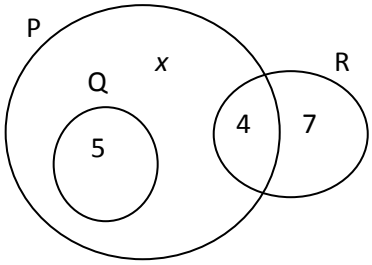
C



D



29 The Venn diagram below shows the number of elements in set *P*, set *Q* and set *R*.
Gambar rajah Venn di bawah menunjukkan bilangan unsur dalam set P, set Q dan set R.



It is given that the universal set, $\xi = P \cup Q \cup R$ and $n(\xi) = 18$.
Find the value of $n(R')$.
Diberi set semesta $\xi = P \cup Q \cup R$ *dan* $n(\xi) = 18$.
Cari nilai bagi $n(R')$.

A 5
B 7
C 9
D 11

30 Given that set $M = \{1, 3, 5, 7\}$. Find the number of the subset of set *M*.
Diberi set $M = \{1, 3, 5, 7\}$. *Cari bilangan subset bagi set M.*

A 12
B 14
C 16
D 18

31 Diagram 31 shows a Venn diagram with the universal set $\xi = J \cup V$.
Rajah 31 *menunjukkan gambar rajah Venn dengan set semesta* $\xi = J \cup V$.

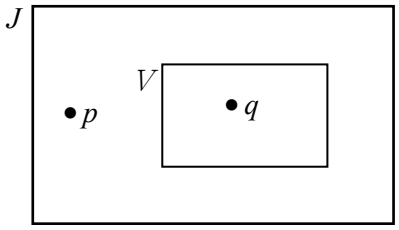


Diagram 31
Rajah 31

List all the subsets of set *J*.
Senaraikan semua subset bagi set J.

A $\{p\}$
B $\{\}, \{p\}$
C $\{p\}, \{q\}, \{p, q\}$
D $\{\}, \{p\}, \{q\}, \{p, q\}$

32 A straight line has a gradient $\frac{2}{3}$ and passes through the point $(-6, -3)$.
The *x*-intercept of the straight line is
Satu garis lurus mempunyai kecerunan $\frac{2}{3}$ *dan melalui titik* $(-6, -3)$.
Pintasan-x bagi garis lurus itu ialah

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

33 Diagram 33 shows two straight line , *PQ* and *QR*, on a Cartesian plane.
Rajah 33 *menunjukkan dua garis lurus, PQ dan QR, pada suatu satah Cartesan.*

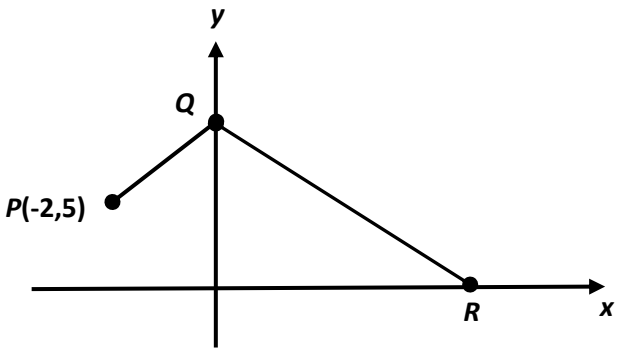


Diagram 33
Rajah 33

It is given that the gradient of *PQ* is 5 and the distance of *QR* is 17 units.
Find the *x*-intercept of line *QR*.
Diberi bahawa kecerunan PQ ialah 5 *dan jarak QR ialah* 17 unit.
Cari pintasan-x bagi QR.

A 8

B 10

C 12

D 15

34 An envelope contains of four blue cards, three red cards and several black cards. A card is chosen at random from the envelope. The probability of choosing a red card is $\frac{1}{4}$.
Find the number of black cards.
Sebuah sampul mengandungi empat keping kad biru, tiga keping kad merah dan beberapa kad hitam. Sekeping kad dipilih secara rawak daripada sampul itu.

Kebarangkalian memilih sekeping kad berwarna merah adalah $\frac{1}{4}$.

Carikan bilangan kad berwarna hitam.

A 5

B 7

C 12

D 21

35 A basket contains 18 red balls and 8 green balls . Ahmad puts another 2 red balls and 4 green balls inside the basket. A ball is chosen at random from the basket.
What is the probability that a red ball is chosen?
Sebuah bakul mengandungi 18 *biji bola merah dan* 8 *biji bola hijau. Ahmad memasukkan lagi* 2 *biji bola merah dan* 4 *biji bola hijau ke dalam bakul itu. Sebiji bola dipilih secara rawak dari pada bakul itu.*
Apakah kebarangkalian sebiji bola merah akan dipilih?

A $\frac{10}{13}$

B $\frac{1}{2}$

C $\frac{3}{8}$

D $\frac{5}{8}$

36 Given that y varies directly as x, and $y = 6$ when $x = 2$, express y in terms of x.
Diberi bahawa y berubah secara langsung dengan x, dan $y = 6$ *apabila* $x = 2$.
Ungkapkan y dalam sebutan x.

A $y = \frac{1}{3}x$

B $y = 3x$

C $y = 12x$

D $y = \frac{12}{x}$

37 The table shows some values of variables P and Q such that P varies inversely as the square root of Q.
Jadual menunjukkan sebahagian daripada nilai-nilai bagi pembolehubah P dan Q, dengan keadaan P berubah secara songsang dengan punca kuasa dua Q.

P	5	3
Q	9	25

Find the relation between P and Q.
Carikan hubungan antara P dan Q.

A $P = \dfrac{15}{\sqrt{Q}}$

B $P = \dfrac{5}{3}\sqrt{Q}$

C $P = \dfrac{5}{81}Q^2$

D $P = \dfrac{405}{Q^2}$

38 The relation between variables p, q and r is $p \propto \dfrac{q}{r}$. It is given that $p = \dfrac{3}{4}$ when $q = 2$ and $r = 8$.
Calculate the value of r when $p = \dfrac{5}{3}$ and $q = 10$.

Hubungan antara pembolehubah-pembolehubah p, q dan r ialah $p \propto \dfrac{q}{r}$.

Diberi $p = \dfrac{3}{4}$ *apabila* $q = 2$ *dan* $r = 8$.

Hitung nilai r apabila $p = \dfrac{5}{3}$ *dan* $q = 10$.

A 3

B 6

C 18

D 36

39 Given that $\begin{pmatrix} -1 \\ 3 \end{pmatrix} + \begin{pmatrix} 5w \\ 6 \end{pmatrix} = \begin{pmatrix} -6 \\ 9 \end{pmatrix}$, find the value of w.

Diberi $\begin{pmatrix} -1 \\ 3 \end{pmatrix} + \begin{pmatrix} 5w \\ 6 \end{pmatrix} = \begin{pmatrix} -6 \\ 9 \end{pmatrix}$, *cari nilai* w.

A -1

B 1

C $-\frac{7}{5}$

D $\frac{7}{5}$

40 $\begin{pmatrix} 3 & 1 \\ -4 & 0 \\ 2 & 3 \end{pmatrix} \begin{pmatrix} 1 \\ -3 \end{pmatrix} =$

A $\begin{pmatrix} 0 \\ -4 \\ -7 \end{pmatrix}$

B $\begin{pmatrix} 4 \\ -4 \\ 7 \end{pmatrix}$

C $\begin{pmatrix} 3 & -3 \\ -4 & 0 \\ 2 & -7 \end{pmatrix}$

D $\begin{pmatrix} 0 & -4 & -7 \end{pmatrix}$

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

NAMA :

TINGKATAN :

BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH
DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PELAJARAN MALAYSIA

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2012
PERCUBAAN SIJIL PELAJARAN MALAYSIA
MATHEMATICS
Kertas 2
Ogos
2½ jam **Dua jam tiga puluh minit**

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini mengandungi dua bahagian :* **Bahagian A** *dan* **Bahagian B**. *Jawab* **semua** *soalan daripada* **Bahagian A** *dan* **empat** *soalan dalam* **Bahagian B**.

2. *Jawapan hendaklah ditulis dengan jelas dalam ruang yang disediakan dalam kertas soalan. Tunjukkan langkah-langkah penting. Ini boleh membantu anda untuk mendapatkan markah.*

3. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*

4. *Satu senarai rumus disediakan di halaman 2 & 3.*

5. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram*

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

Kertas soalan ini mengandungi 27 halaman bercetak.

MATHEMATICAL FORMULAE

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

RELATIONS

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

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

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

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

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

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

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

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

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

10 Pythagoras Theorem

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

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

SHAPES AND SPACE

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

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

3 Area of circle = πr^2

4 Curved surface area of cylinder = $2\pi rh$

5 Surface area of sphere = $4\pi r^2$

6 Volume of right prism = cross sectional area × length

7 Volume of cylinder = $\pi r^2 h$

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

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

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

11 Sum of interior angles of a polygon = $(n-2) \times 180^\circ$

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

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

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

15 Area of image = k^2 × area of object

For Examiner's Only

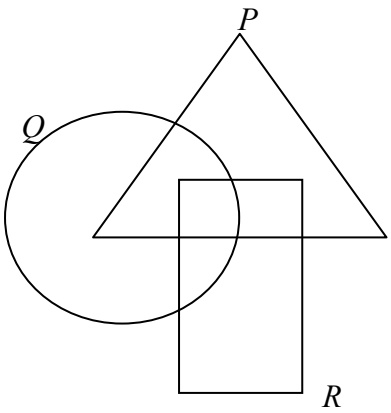
Section A
***Bahagian* A**
[52 *marks*]
[52 *markah*]
Answer **all** questions in this section.
Jawab **semua** *soalan dalam bahagian ini*.

1 The Venn diagram in the answer space shows sets P , Q and R such that the universal set $\xi = P \cup Q \cup R$.
On the diagrams in the answer space, shade the set
Gambar rajah Venn di ruang jawapan menunjukkan set P, set Q dan set R dengan keadaan set semesta $\xi = P \cup Q \cup R$.
Pada rajah di ruang jawapan, lorek set
(a) $P \cap Q$
(b) $P' \cap Q \cup R$

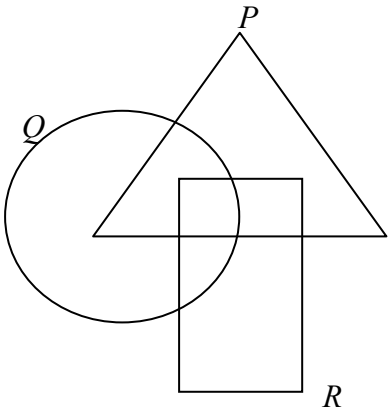
[3 *marks*]
[3 *markah*]

Answer/ *Jawapan*:

(a)



(b)



2 Calculate the value of p and of q that satisfy the following simultaneous linear equations:
Hitungkan nilai p dan nilai q yang memuaskan persamaan linear serentak berikut:

$$4p - 3q = 10$$
$$2p + 5q = -8$$

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

Answer/ *Jawapan*:

3 Solve the quadratic equation $\frac{p-1}{1-p} = \frac{2}{3p}$.

Selesaikan persamaan kuadratik $\frac{p-1}{1-p} = \frac{2}{3p}$.

[4 marks]
[4 *markah*]

Answer/ *Jawapan*:

For Examiner's Only

4 Diagram 4 shows a right prism with a square base *HJKL*. Trapezium *EFLK* is the uniform cross section of the prism. *M*, *N* and *P* are the midpoints of *ED*, *JK* and *HL* respectively.

Rajah 4 *menunjukkan sebuah prisma dengan tapak mengufuk HJKL yang berbentuk segi empat sama. Trapezium EFLK ialah keratan rentas seragam prisma itu. M, N dan P adalah titik tengah bagi ED, JK dan HL masing-masing.*

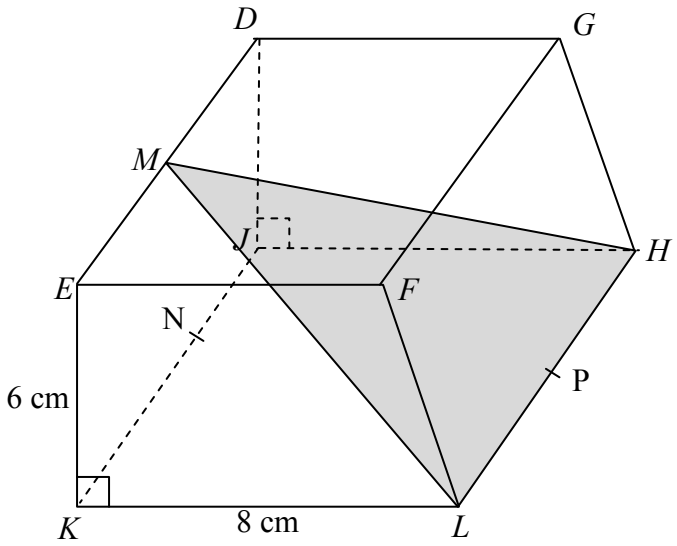


Diagram 4
Rajah 4

(a) Name the angle between the plane *HML* and the plane *DEKJ*.
Namakan sudut di antara satah HML dan satah DEKJ.

(b) Calculate the angle between the plane *HML* and the plane *DEKJ*.
Hitungkan sudut di antara satah HML dengan satah DEKJ.

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

Answer/*Jawapan*:

(a)

(b)

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

(i) $3^2 - 1 = 5$ or $12 \div 3 = 4$
$3^2 - 1 = 5$ *atau* $12 \div 3 = 4$

(ii) $28 \div 7 = 4$ and $9^2 = 18$
$28 \div 7 = 4$ *dan* $9^2 = 18$

(b) Write **two** implications based on the following sentence:

$3m > 18$ if and only if $m > 6$

Tulis ***dua*** *implikasi daripada ayat berikut:*

$3m > 18$ *jika dan hanya jika* $m > 6$

(c) Write down Premise 2 to complete the following argument:.
Tulis Premise 2 *untuk melengkapkan hujah berikut*:

Premise 1: If x^3 is more than zero, then x is a positive number.

Premis 1: *Jika* x^3 *lebih besar daripada sifar, maka* x *ialah nombor positif.*

Premise 2/ *Premis* 2: _____

Conclusion: 2 is a positive number.

Conclusion: 2 *ialah nombor positif.*

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

Answer/ *Jawapan*:

(a) (i) …….

(ii) …….

(b) Implication 1/*Implikasi* 1: ……

Implication 2/*Implikasi 2*: ……

(c) Premise 2/*Premis* 2: ……..

For Examiner's Only

6 Diagram 6 shows a parallelogram *OFGH* drawn on a Cartesian plane.
Rajah 6 menunjukkan segiempat selari OFGH yang dilukis pada suatu satah Cartesan.

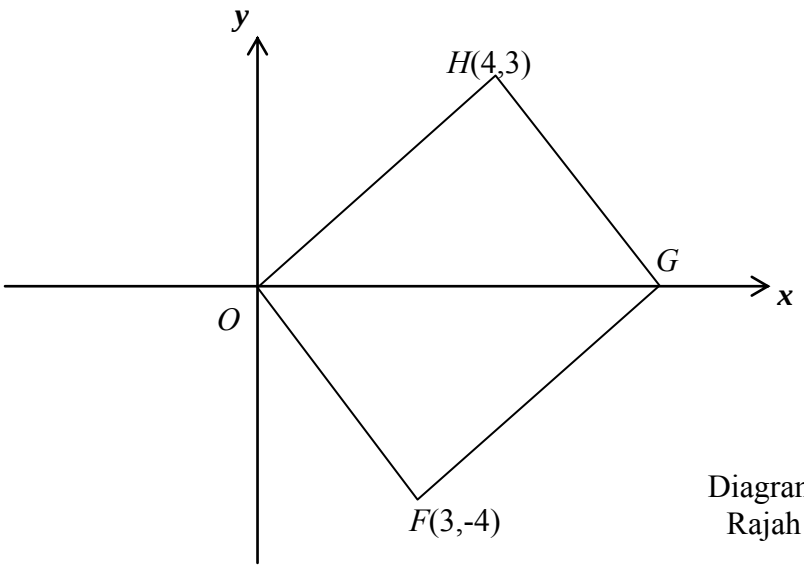


Diagram 6
Rajah 6

Find
Cari

(a) the equation of straight line *GH*.
persamaan garis lurus GH.

(b) the *x*-intercept of the straight line *GH*.
pintasan-x bagi garis lurus GH

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

Answer/ *Jawapan.*

(a)

(b)

7 Diagram 7 shows a composite solid formed by the combination of a cuboid and a half circular cylinder.
Rajah 7 menunjukkan sebuah gabungan pepejal yang dibentuk daripada cantuman sebuah kuboid dan separuh silinder.

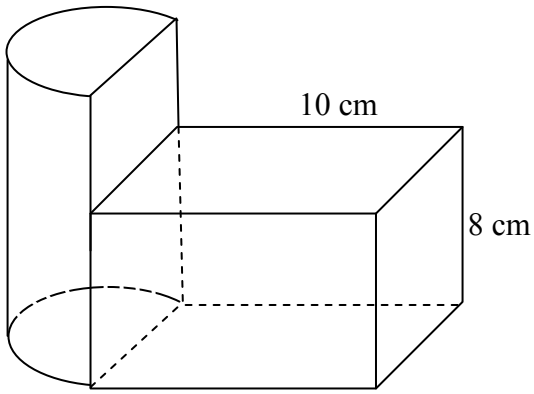


Diagram 7
Rajah 7

The height and diameter of the half circular cylinder is 15 cm and 7 cm respectively.
Tinggi dan diameter separuh silinder ialah 15 cm dan 7 cm masing-masing.

Using $\pi = \frac{22}{7}$, find the volume of the combined solid.

Menggunakan $\pi = \frac{22}{7}$, *hitungkan isipadu gabungan pepejal itu.*

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

Answer/ *Jawapan*:

For Examiner's Only

8 (*a*) It is given that $\frac{1}{4}\begin{pmatrix} k & 3 \\ 2 & 2 \end{pmatrix}$ is the inverse matrix of $\begin{pmatrix} 2 & -3 \\ -2 & k \end{pmatrix}$.

Find the value of k.

Diberi bahawa $\frac{1}{4}\begin{pmatrix} k & 3 \\ 2 & 2 \end{pmatrix}$ *ialah matriks songsang bagi* $\begin{pmatrix} 2 & -3 \\ -2 & k \end{pmatrix}$

Carikan nilai k.

(*b*) Write the following simultaneous linear equations as matrix equation.

Tulis persamaan linear serentak berikut dalam bentuk persamaan matriks.

$$2x - 3y = -11$$

$$-2x + 5y = 19$$

Hence, using matrices, calculate the value of x and of y.

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

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

Answer/ *Jawapan*:

(a)

(b)

9 Diagram 9 shows two sectors, *OTSR* and *OPUQV* with common centre *O*. *PR* and *TV* are straight lines. *U* and *Q* are midpoint of *OT* and *OR* respectively.
Rajah 9 menunjukkan dua sektor bulatan, OTSR dan OPUQV, dengan pusat sepunya O. PR dan TV adalah garis lurus.U dan Q adalah titik tengah bagi OT dan OR masing-masing.

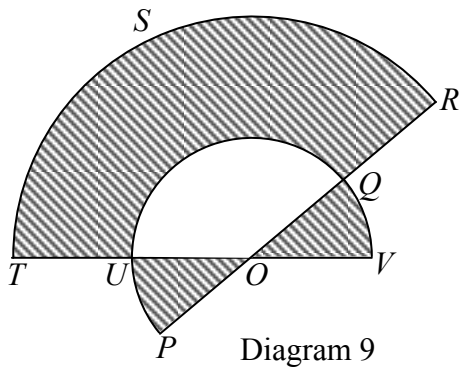


Diagram 9
Rajah 9

$OV = 7$ cm and $\angle UOQ = 120°$.
$OV = 7$ cm *dan* $\angle UOQ = 120°$.

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

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

(a) the perimeter , in cm, of the whole diagram,
perimeter, *dalam* cm , *seluruh rajah itu.*

(b) the area, in cm^2, of the shaded region.
luas, *dalam* cm^2, *kawasan yang berlorek.*

[6 marks]
[6 *markah*]

Answer/ *Jawapan.*

(a)

(b)

For Examiner's Only

10 Table 10 shows the number of a group of students in class 5 Alpha and class 5 Beta who entitles to receive a tuition voucher.
Jadual 10 *menunjukkan bilangan murid bagi sekumpulan murid dalam kelas* 5 *Alpha dan kelas* 5 *Beta yang layak menerima bantuan baucer tuisyen.*

Gender *Jantina* / Class *Kelas*	5 Alpha	5 Beta
Boys *Lelaki*	4	5
Girls *Perempuan*	6	3

Table 10
Jadual 10

Two students from the group are chosen at random to receive a tuition voucher each.
Dua orang murid dari kumpulan ini dipilih secara rawak untuk menerima bantuan satu baucer tuisyen seorang.

(a) A student is chosen at random from 5 Alpha and another student is chosen at random from 5 Beta. Find the probability that:
Seorang murid dipilih secara rawak daripada 5 *Alpha dan seorang murid lagi dipilih secara rawak daripada* 5 *Beta. Cari kebarangkalian bahawa:*

(i) both students chosen are boys,
kedua-dua murid yang dipilih adalah lelaki,

(ii) a boy and a girl are chosen,
seorang murid lelaki dan seorang murid perempuan dipilih,

(b) A student is chosen at random from the boys group and then another student is chosen at random from the girls group.
Find the probability that both students chosen are from the same class.
Seorang murid dipilih secara rawak daripada murid lelaki dan kemudian seorang murid lagi dipilih secara rawak daripada kumpulan murid perempuan.
Cari kebarangkalian bahawa kedua-dua peserta yang dipilih adalah dari kelas yang sama.

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

Answer/ *Jawapan*:

(a)

(b)

For Examiner's Only

11 Diagram 11 shows the speed-time graph for the movement of a particle for a period of 40 seconds.
Rajah 11 *menunjukkan graf laju-masa bagi pergerakan satu zarah dalam tempoh* 40 *saat.*

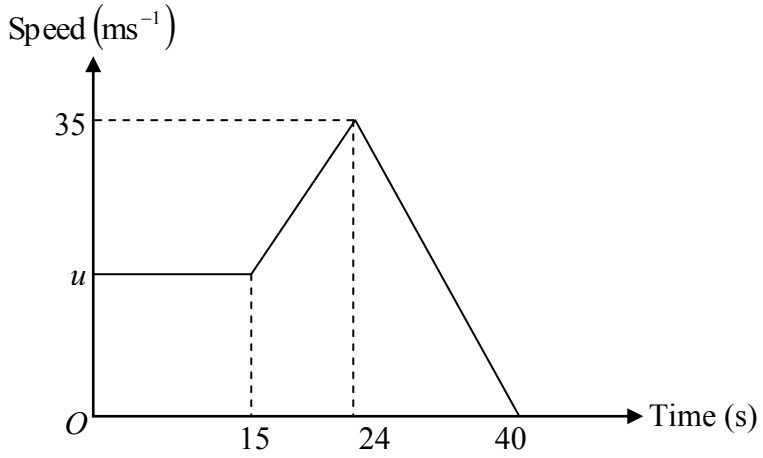


Diagram 11
Rajah 11

(a) State the length of time, in s, for which the particle moves with uniform speed.
Nyatakan tempoh masa, dalam s*, yang mana zarah bergerak dengan laju seragam.*

(b) Calculate the rate of change of speed, in ms^{-2}, in the last 16 seconds.
Hitung kadar perubahan laju zarah, *dalam* ms^{-2}, *dalam*16 *saat terakhir*.

(c) Calculate the value of *u*, if the distance traveled in the last 25 seconds is 514 m.
Hitung nilai u, jika jumlah jarak yang dilalui dalam 25 saat *terakhir ialah* 514 m.

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

Answer/*Jawapan* :

Section B
Bahagian B
[48 marks]
[48 *markah*]
Answer any **four** question from this section.
Jawab mana-mana **empat** *soalan daripada bahagian ini*.

12 (a) Complete Table 12 in the answer space for the equation $y = -\frac{5}{x}$ by writing down the values of y when $x = -3$ and $x = 2.5$

Lengkapkan Jadual berikut, di ruang jawapan, bagi persamaan $y = -\frac{5}{x}$ *dengan menulis nilai-nilai y apabila* $x = -3$ *dan* $x = 2.5$.

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

(b) For this part of the question, use the graph paper provided .
You may use flexible curve rule.
Untuk ceraian soalan ini, *gunakan kertas graf yang disediakan* .
Anda boleh menggunakan pembaris fleksibel.

Using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 2 unit on the y-axis, draw the graph of $y = -\frac{5}{x}$ for $-4 \le x \le 4$.

Dengan menggunakan skala 2 cm *kepada* 1 *unit pada paksi-x dan* 2 cm *kepada* 2 *unit pada paksi-y, lukiskan graf* $y = -\frac{5}{x}$ *bagi* $-4 \le x \le 4$.

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

(c) From the graph in **12**(b), find
Dari graf di **12***(b), cari*

(i) the value of y when $x = 1.8$
nilai y apabila $x = 1 \cdot 8$,

(ii) the value of x when $y = 3.4$
nilai x apabila $y = 3 \cdot 4$.

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

For Examiner's Only

(d) Draw a suitable straight line on the graph in **12**(b) to find the values of x which satisfy the equation $\frac{5}{x} = 2x + 3$ for $-4 \le x \le 4$.
State the values of x.

Lukiskan satu garis lurus yang sesuai pada graf di **12***(b) untuk mencari semua nilai* x *yang memuaskan persamaan* $\frac{5}{x} = 2x + 3$ *bagi* $-4 \le x \le 4$.
Nyatakan nilai-nilai x *itu.*

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

Answer/*Jawapan*:

(a)

x	−4	−3	−2	−1	−0.5	0.5	1	1.5	2.5	4
y	1.25		2.5	5	10	−10	−5	−3.33		−1.25

Table 12
Jadual 12

(b) Refer graph.
Rujuk graf.

(c) (i) $y =$ _____

(ii) $x =$ _____

(d)

The equation of the straight line:
Persamaan garis lurus:

_____

$x =$ _____ , _____

13 Diagram 13 shows triangles *ABC*, *PQR* and *LMN* on a Cartesian plane

Rajah 13 *menunjukkan segitiga ABC, PQR dan LMN pada suatu satah Cartesan.*

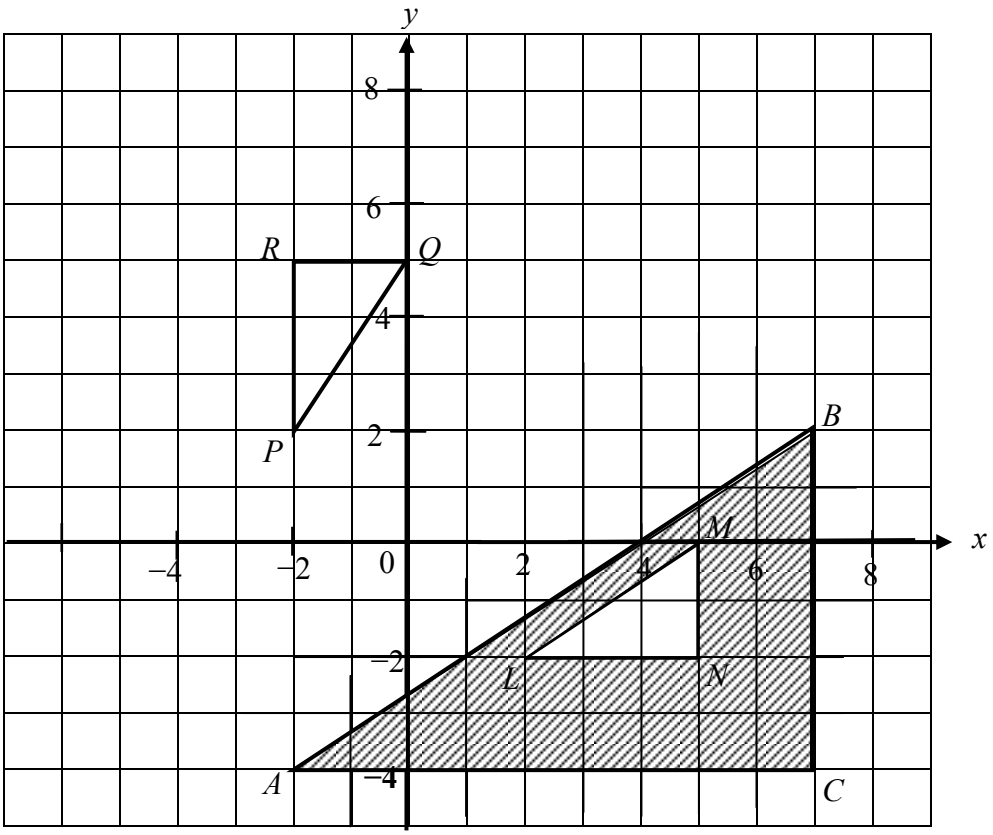


Diagram 13
Rajah 13

.

(a) Transformation **D** is a 90° anti-clockwise rotation about point (2,1).

Transformation **E** is the translation $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$.

State the coordinates of the images of point *M* under the following transformation:

Penjelmaan **D** *ialah putaran 90° lawan arah jam pada pusat* (2,1).

Penjelmaan **E** *ialah translasi* $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$.

Nyatakan koordinat imej bagi titik M di bawah setiap penjelmaan berikut:

(i) **DE**

(ii) **ED**

[4 *marks*]

[4 *markah*]

For Examiner's Only

(b) *LMN i*s the image of *PQR* under transformation **V**, and *ABC* is the image of *LMN* under transformation **W**.

LMN ialah imej bagi PQR di bawah penjelmaan **V***, dan ABC ialah imej bagi LMN di bawah penjelmaan* **W.**

(i) Describe in full, transformations **V** and **W**.

Huraikan selengkapnya penjelmaan **V** *dan* **W**.

(ii) Given the area of the shaded region is 56 cm^2, calculate, in cm^2, the area of triangle *RPQ*.

Diberi bahawa luas kawasan berlorek ialah 56 cm^2 *, Hitungkan luas, dalam* cm^2*, segitiga RPQ.*

[8 *marks*]
[8 *markah*]

Answer/ *Jawapan*:

(a) (i) _____

(ii) _____

(b) (i) **V:** _____

W: _____

(ii)

14 Diagram 14 shows the length, in cm, of 32 pieces of ribbons.
Rajah 14 *menunjukkan panjang, dalam* cm, *bagi* 32 *helai reben.*

26	37	30	31	29	55	32	46
50	28	49	42	30	50	28	33
42	46	26	53	31	40	34	48
26	31	35	40	44	27	47	33

Diagram 14
Rajah 14

(a) Using the data in Diagram 14 and by using a class interval of 5 cm, complete the Table 14 in the answer space on page 21.

Dengan menggunakan data dalam Rajah 14 *dan selang kelas* 5 cm *, lengkapkan Jadual* 14 *di ruang jawapan pada halaman* 21.

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

(b) State the modal class.
Nyatakan kelas mod.

[1 *marks*]
[1 *markah*]

(c) Based on the Table 14, calculate the estimated mean length of the ribbon.
Berdasarkan Jadual 14 *, hitung min anggaran panjang reben.*

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

(d) For this part of the question, use the graph paper.
By using a scale of 2 cm to 5 cm on the *x*- axis and 2 cm to 1 ribbon on the *y*- axis, draw a frequency polygon for the data.

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan.
Dengan menggunakan skala 2 cm *kepada* 5 cm *pada paksi-x dan* 2 cm *kepada* 1 *reben pada paksi-y, lukis satu poligon kekerapan bagi data tersebut.*

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

For Examiner's Only

Answer/*Jawapan*:

(a)

Class interval	Frequency	Midpoint
21 - 25		
26 - 30		

(b)

(c)

(d) Refer graph.
Rujuk graf.

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

(a) Diagram 15(i) shows a solid right prism with rectangular base *PQRS* on a horizontal plane. The surface *SPUT* is the uniform cross section of the prism. *UP* and *VQ* are vertical edges. Rectangle *TUVW* and rectangle *TSRW* are inclined planes. *T* is vertically above *N*.
Given that *TN* = 7 cm, *NP* = 4 cm and *SN* = 2 cm.
Rajah 15(i) *menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segi empat tepat PQRS terletak di atas satah mengufuk. Permukaan SPUT ialah keratan rentas seragam prisma itu. Tepi UP dan VQ adalah tegak. Segi empat tepat TUVW dan segi empat tepat TSRW ialah satah condong. T berada tegak di atas N.*
Diberi bahawa TN = 7 cm, *NP* = 4 cm *dan SN* = 2 cm

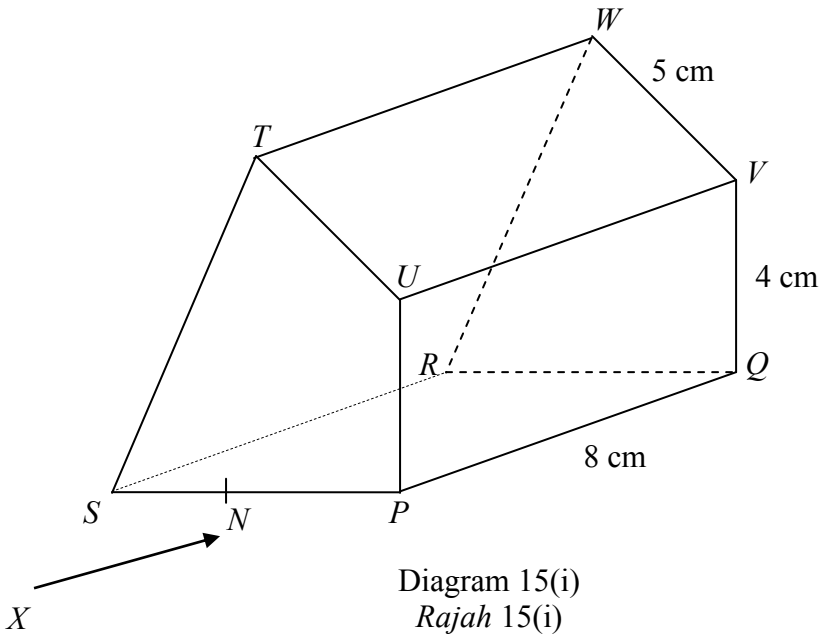


Diagram 15(i)
Rajah 15(i)

Draw to full scale, the elevation of the solid on a vertical plane parallel to *SP* as viewed from *X*. [3 marks]
Lukis dengan skala penuh, dongakan pepejal itu pada satah mencancang yang selari dengan SP sebagaimana dilihat dari X. [3 *markah*]

For Examiner's Only

Answer/ *Jawapan*:

(a)

(b) A solid cuboid is cut and removed from the solid in Diagram 15(i).
The remaining solid is shown in Diagram 15(ii).
Rectangle *BCDE* is a horizontal plane. *AB* = 1 cm and *BC* = 1.5 cm.

Sebuah pepejal kuboid dipotong dan dikeluarkan daripada pepejal pada Rajah 15(i). *Pepejal yang tinggal ditunjukkan di Rajah* 15(ii).
Segi empat tepat BCDE ialah satah mengufuk. *AB* = 1 cm dan *BC* = 1.5 cm.

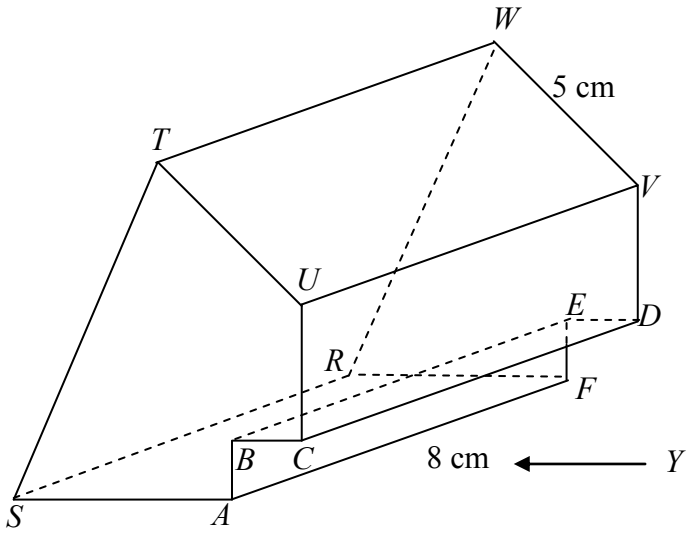


Diagram 15(ii)
Rajah 15(ii)

Draw to full scale,
Lukis dengan skala penuh,

(i) the plan of the remaining solid, [5 marks]
pelan pepejal yang tinggal itu, [5 *markah*]

(ii) the elevation of the remaining solid on a vertival plane parallel to *AF* as viewed from *Y*. [4 marks]
dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan AF sebagaimana dilihat dari Y. [4 *markah*]

For Examiner's Only

Answer/ *Jawapan.*

(b) (i)

(b) (ii)

16 Diagram 16 shows the locations of three points, *P*, *Q* and *R* on the surface of the earth. *O* is the centre of the earth. The longitude of *R* is 100° *E*.
Rajah 16 *menunjukkan kedudukan tiga titik ,P, Q dan R pada permukaan bumi. O ialah pusat bumi. Longitud bagi R ialah* 100° *E.*

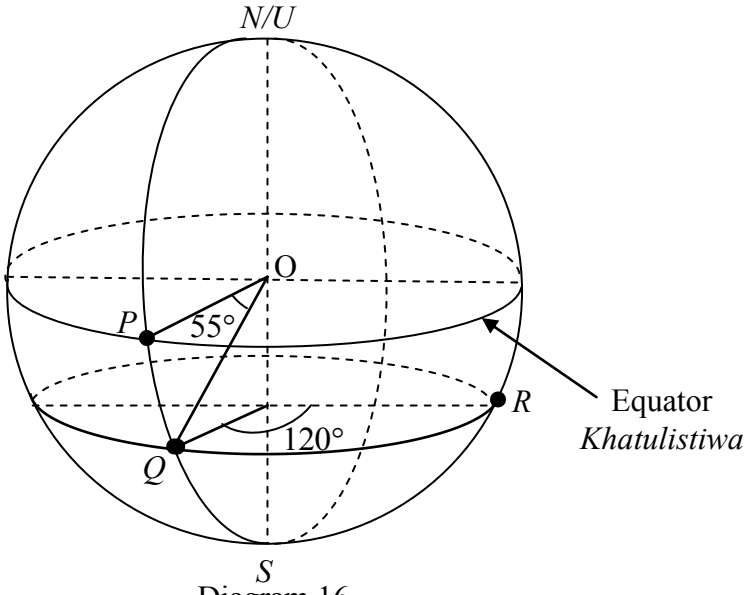


Diagram 16
Rajah 16

(a) (i) State the latitude of *Q*. [2 *marks*]
Nyatakan latitud bagi Q. [2 *markah*]

(ii) State the location of *P*. [2 *marks*]
Nyatakan kedudukan bagi P. [2 *markah*]

(b) *T* lies 7200 nautical miles due north of *R*.
Calculate the latitude of *T*. [3 *marks*]
T terletak 7200 *batu nautika ke utara R.*
Hitung latitud bagi T. [3 *markah*]

(c) Calculate the distance, in nautical mile, from *R* due west to *Q* measured along the parallel of latitude. [3 *marks*]
Hitung jarak, dalam batu nautika, dari R arah ke barat ke Q diukur sepanjang selarian latitud sepunya. [3 *markah*]

(d) An aeroplane took off from *R* and flew due north to *T*. The time taken for the flight is 11 hours.
Calculate the average speed, in knot, for the flight. [2 *marks*]
Sebuah kapal terbang berlepas dari R arah ke utara ke T. Masa untuk penerbangan itu ialah 11 *jam.*
Hitung purata laju, dalam knot, bagi penerbangan itu. [2 *markah*]

Answer/ *Jawapan:*

For Examiner's Only

(a) (i)

(ii)

(b)

(c)

(d)

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

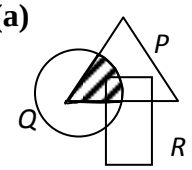
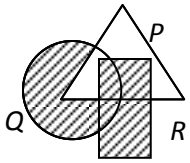
PEPERIKSAAN PERCUBAAN SELARAS SBP 2012

MATEMATIK

KERTAS 1

NO	JAWAPAN	NO.	JAWAPAN	NO.	JAWAPAN	NO.	JAWAPAN
1	C	11	B	21	D	31	D
2	C	12	A	22	D	32	B
3	B	13	C	23	C	33	A
4	D	14	D	24	A	34	A
5	C	15	A	25	A	35	D
6	A	16	C	26	C	36	B
7	D	17	B	27	C	37	A
8	D	18	C	28	D	38	C
9	B	19	C	29	B	39	A
10	C	20	B	30	C	40	A

Marking Scheme Trial SBP 2012

No.	Answer	Marks	Total
1	**(a)**  **(b)** 	**P1, P2**	**3**
2	$4p+10q = -16$ $-13q = 26$ $p = 1$ $q = -2$	K1 K1 N1 N	**4**
3	$3p^2 - p - 2 = 0$ $(3p+2)(p-1) = 0$ $p = -\frac{2}{3}, \quad p = 1$	K1 K1 N1, N1	**4**
4	$\angle PMN$ $\tan \angle PMN = \frac{8}{6}$ $\angle PMN = 53.13^{o}$ or $53^{o}8'$	**P1** **K1** **N1**	**3**
5	a) i) True ii) False b) Implication 1: If $3m > 18$ then $m > 6$ Implication 2: If $m > 6$ then $3m > 18$ c) Premise 2: 2^3 is more than zero	N1 N1 N1 N1 N1	**5**
6	$m_{HG} = m_{OF}$ $= \frac{-4-0}{3-0}$ $= \frac{-4}{3}$ $y = -\frac{4}{3}x + c$	K1	

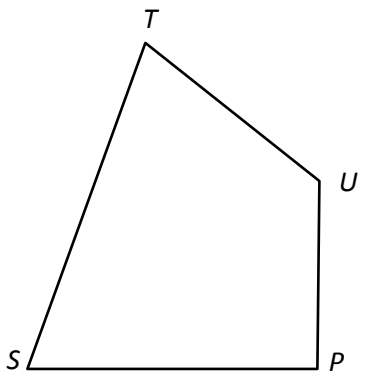
	$3 = -\frac{4}{3}(4) + c$ $c = \frac{25}{3}$ Equation $GH = y = -\frac{4}{3}x + \frac{25}{3}$ $0 = -\frac{4}{3}x + \frac{25}{3}$ $x = \frac{25}{4}$	K1 N1 K1 N1	**5**
7	$\frac{1}{2} \times \frac{22}{7} \times (3.5)^2 \times 15$ $10 \times (7) \times (8)$ $\frac{1}{2} \times \frac{22}{7} \times (3.5)^2 \times 15 + 10(7)(8)$ $848\frac{3}{4}\ cm^3$	K1 K1 K1 N1	**4**
8	inverse $\begin{pmatrix} 2 & -3 \\ -2 & k \end{pmatrix}$ $= \frac{1}{2k-(6)}\begin{pmatrix} k & -3 \\ 2 & 2 \end{pmatrix}$ Compare with $\frac{1}{4}\begin{pmatrix} k & 3 \\ 2 & 2 \end{pmatrix}$ *or* $2k - 6 = 4$ $k = 5$ $\begin{pmatrix} 2 & -3 \\ -2 & 5 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -11 \\ 19 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{4}\begin{pmatrix} 5 & 3 \\ 2 & 2 \end{pmatrix}\begin{pmatrix} -11 \\ 19 \end{pmatrix}$ $x = \frac{1}{2}$ $y = 4$	K1 N1 P1 K1 N1 N1	**6**

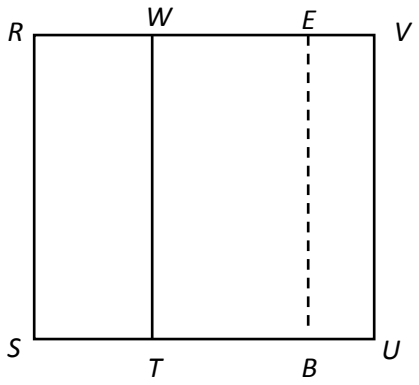
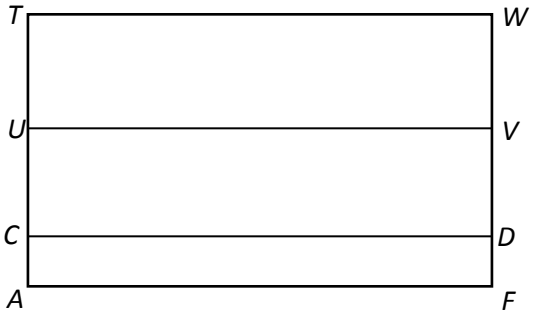
9(a)	$\frac{120}{360}\times 2\times\frac{22}{7}\times 14$ or $\frac{60}{360}\times 2\times\frac{22}{7}\times 7$	K1	
	$\frac{120}{360}\times 2\times\frac{22}{7}\times 14 + 2\left(\frac{60}{120}\times 2\times\frac{22}{7}\times 7\right)+7+7+7+7$	K1	
	72	N1	
(b)	$\frac{120}{360}\times\frac{22}{7}\times 14^2$ or $\frac{60}{360}\times\frac{22}{7}\times 7^2$ or $\frac{120}{360}\times\frac{22}{7}\times 7^2$	K1	
	$\frac{120}{360}\times\frac{22}{7}\times 14^2 + 2\times\frac{60}{360}\times\frac{22}{7}\times 7^2 - \frac{120}{360}\times\frac{22}{7}\times 7^2$	K1	
	$205\frac{1}{3}$ *or* 205.33	N1	
10	(a)(i) $\frac{4}{10}\times\frac{5}{8}=\frac{1}{4}$	K1 N1	
	(a)(ii) $\frac{4}{10}\times\frac{3}{8}+\frac{5}{8}\times\frac{6}{10}=\frac{21}{40}$	K1 N1	
	(b) $\frac{4}{9}\times\frac{6}{9}+\frac{5}{9}\times\frac{3}{9}=\frac{13}{27}$	K1 N1	
11	(a) 15	P1	
	(b) $\frac{35-0}{24-40}=-2.1875$	K1 N1	
	(c) $\frac{1}{2}\times(u+35)\times 9+\frac{1}{2}\times 16\times 35=514$	K2	
	$u=17$	N1	
12	(a) <table><tr><td>x</td><td>−3</td><td>2.5</td></tr><tr><td>y</td><td>1.67</td><td>−2</td></tr></table>	K1 K1	
	(b) Refer graph Uniform scale on both axes All points correctly plotted	**K1** K1N1 (Second quadrant)	

	Smooth curve passing through all plotted points	K1N1 (Fourth quadrant)	
	(c) $y = -2.8 \pm 0.1$ $x = -1.45 \pm 0.05$	N1 N1	
	(d) Equation of straight line $y = -2x - 3$ Draw straight line on the graph $x = -2.5 \pm 0.05$ $x = 1 \pm 0.05$	K1 K1 N1	
13	a) i) (4,7) ii) (6,3) b) (i) V is a reflection in the line $y = x$ W is an enlargement of scale factor 3 about the point (4,-1). (ii) $3^2 \times$ area RPQ – area RPQ = 56 Area of RPQ = 7	P2 P2 P1P1 P1P1P1 K1K1 N1	**12**
14(a)			

Class interval	Frequency	Midpoint
21 - 25	0	23
26 - 30	9	28
31 – 35	8	33
36 – 40	3	38
41 – 45	3	43
46 – 50	7	48
51 - 55	2	53

Column I P1

	Column II P1 Column III P1		
(b)	26 - 30	P1	
(c)	Mean $= \frac{9(28)+8(33)+3(38)+3(43)+7(48)+2(53)}{9+8+3+3+7+2}$ $= 37.53$	K2 N1	
(d)	Frequency Polygon Axes drawn in the correct direction , uniform scale for $23 \le x \le 58$ and $0 \le y \le 10$. Horizontal axis labeled using midpoint / boundary / class interval. 7 points plotted correctly *or* the polygon frequency passed through them. Points (23 , 0) and (58 , 0) plotted correctly *or* the polygon frequency passed through them. The polygon frequency completed and passed through 8 points correctly.	K1 K1 K1 K1 N1	**12**
15(a)	 Correct shape of quadrilateral SP > TU > UP Correct measurement ± 2mm, angle ± 1°	N1 N1 N1	

(b)	 Correct shape of two rectangles Dotted line RS > SU >TB > ST >BU Correct measurement ± 2mm, angle ± 1°  Correct shape of three rectangles AF > AT > UT = WV > DF Correct measurement ± 2mm, angle ± 1°	K1 K1 K1 N2 K1 K1 N2	
16 (a)(i)	55°S	P2	

(ii)	$120° - 100^{\circ} = 20°$ P $(0°, 20^{\circ}W)$	K1 N1	
(b)	$\frac{7200}{60} = 120°$ $120° - 55°$ $65°$ N	K1 K1 N1	
(c)	$120° \times 60' \times cos55°$ 4129.75 nautical miles	P1, K1 N1	
(d)	$\frac{7200}{11}$ 654.55 knots	K1 N1	**12**

Graf untuk soalan 12