

1449/1
Matematik
Kertas 1
Ogos
2010
1 ¼ jam



BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010

MATEMATIK
Kertas 1
Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

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 setiap soalan, pilih satu jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.*
4. *Jika anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*

Kertas soalan ini mengandungi 26 halaman bercetak

MATHEMATICAL FORMULAE
RUMUS MATEMATIK

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

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

10. Pythagoras Theorem
Teorem Pithagoras

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

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

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

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

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

$$m = - \frac{p \text{ int asan} - y}{p \text{ int asan} - x}$$

SHAPES AND SPACE
BENTUK DAN RUANG

- 1 Area of trapezium = $\frac{1}{2} \times$ sum of parallel sides \times height
Luas trapezium = $\frac{1}{2} \times$ hasil tambah dua sisi selari \times tinggi
- 2 Circumference of circle = $\pi d = 2\pi r$
Lili tan bula tan = $\pi d = 2\pi j$
- 3 Area of circle = πr^2
Luas bulatan = πj^2
- 4 Curved surface area of cylinder = $2\pi r h$
Luas permukaan melengkung silinder = $2\pi j t$
- 5 Surface area of sphere = $4\pi r^2$
Luas permukaan sfera = $4\pi j^2$
- 6 Volume of right prism = cross sectional area \times length
Isipadu prisma tegak = *luas keratan rentas* \times *panjang*
- 7 Volume of cylinder = $\pi r^2 h$
Isipadu silinder = $\pi j^2 t$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
Isipadu kon = $\frac{1}{3} \pi j^2 t$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
Isipadu sfera = $\frac{4}{3} \pi j^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times$ base area \times height
Isipadu piramid tegak = $\frac{1}{3} \times$ *luas tapak* \times *tinggi*

- 11 Sum of interior angles of a polygon

Hasil tambah sudut pedalaman poligon

$$= (n - 2) \times 180^\circ$$

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

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

- 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, $k = \frac{PA'}{PA}$

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

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

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

- 1 Round off 80 209 correct to three significant figures.
Bundarkan 80 209 betul kepada tiga angka bererti.
- A 80 000
 - B 80 200
 - C 80 210
 - D 80 300
- 2 Express 528 000 in standard form.
Ungkapkan 528 000 dalam bentuk piawai.
- A 5.28×10^{-5}
 - B 5.28×10^{-3}
 - C 5.28×10^3
 - D 5.28×10^5
- 3 $8 \times 10^{-7} - 3.4 \times 10^{-8}$
- A 4.6×10^{-8}
 - B 4.6×10^{-7}
 - C 7.66×10^{-8}
 - D 7.66×10^{-7}
- 4 The mass of an hydrogen atom is 1.7×10^{-24} g and the mass of an oxygen atom is 2.7×10^{-23} g. One molecule of water is made up of two hydrogen atoms and one oxygen atom. Find the mass, in g, of one molecule of water.
Jisim satu atom hidrogen ialah 1.7×10^{-24} g dan jisim satu atom oksigen ialah 2.7×10^{-23} g. Satu molekul air terdiri daripada dua atom hidrogen dan satu atom oksigen. Cari jisim, dalam g, satu molekul air.
- A 3.04×10^{-23}
 - B 2.87×10^{-23}
 - C 5.57×10^{-23}
 - D 5.74×10^{-23}
- 5 $101_2 + 1101_2 =$
- A 1010_2
 - B 10010_2
 - C 10110_2
 - D 10111_2

- 6 Express 130_5 as a number in base ten.
 Ungkapkan 130_5 sebagai satu nombor dalam asas sepuluh.

- A 34_{10}
 B 39_{10}
 C 40_{10}
 D 41_{10}

- 7 In Diagram 7, $PQRSTW$ is a regular hexagon and $TUVW$ is a rectangle.
 Dalam Rajah 7, $PQRSTW$ ialah sebuah heksagon sekata dan $TUVW$ ialah sebuah segiempat tepat.

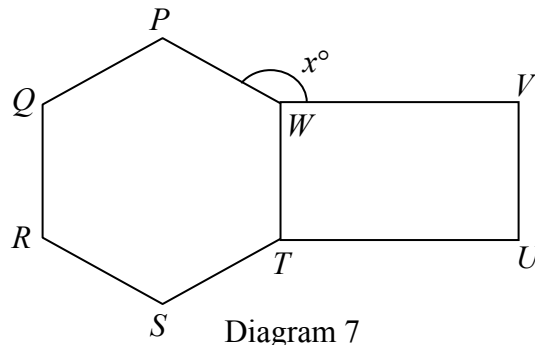


Diagram 7
 Rajah 7

Find the value of x .
 Cari nilai bagi x .

- A 180°
 B 170°
 C 162°
 D 150°

- 8 Diagram 8 shows a circle, EFK with centre O . JKL is a tangent to the circle at K .
Rajah 8 menunjukkan sebuah bulatan EFK berpusat O . JKL ialah tangen kepada bulatan itu pada K .

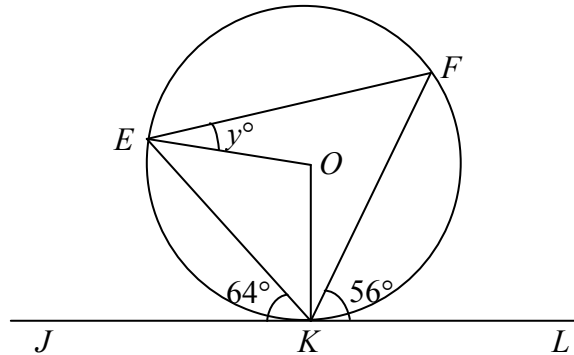


Diagram 8
Rajah 8

Find the value of y .
Cari nilai bagi y .

- A 30°
- B 25°
- C 36°
- D 40°

- 9 Diagram 9 shows five pentagons **A**, **B**, **C**, **D** and *P* drawn on square grid.
Rajah 9 menunjukkan 5 pentagon A, B, C, D dan P yang dilukis pada grid segiempat sama.

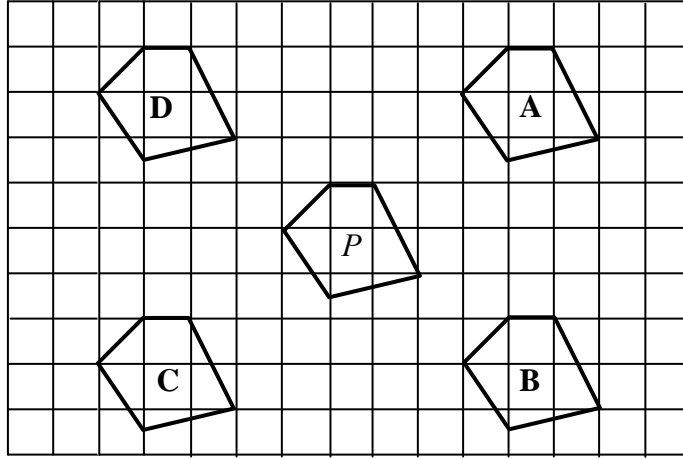


Diagram 9
Rajah 9

Which of the pentagons **A**, **B**, **C** and **D** is the image of *P* under translation $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$?

Antara pentagon A, B, C dan D yang manakah imej P di bawah translasi $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$?

10 Diagram 10 shows two quadrilaterals, $ABCD$ and $PQRS$. $PQRS$ is the image of $ABCD$ under an enlargement.

Rajah 10 menunjukkan dua sisiempat, $ABCD$ dan $PQRS$. $PQRS$ ialah imej bagi $ABCD$ di bawah satu pembesaran.

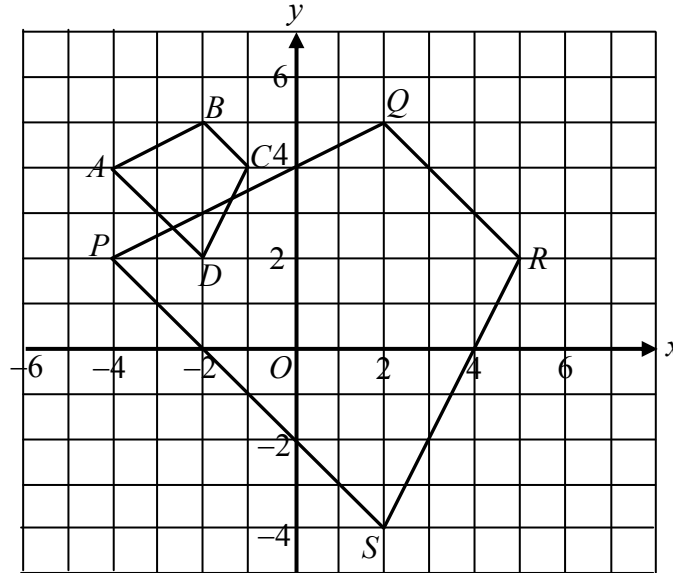


Diagram 10
Rajah 10

Find the coordinates of the centre of the enlargement.

Cari koordinat bagi pusat pembesaran itu.

- A $(-4, 4)$
- B $(-2, 5)$
- C $(-2, 2)$
- D $(-4, 5)$

- 11 In Diagram 11, ABC is a straight line. Given that $\tan \angle CBD = \frac{3}{2}$ and B is the midpoint of AC .

Dalam Rajah 11, ABC ialah garis lurus. Diberi $\tan \angle CBD = \frac{3}{2}$ dan B ialah titik tengah AC .

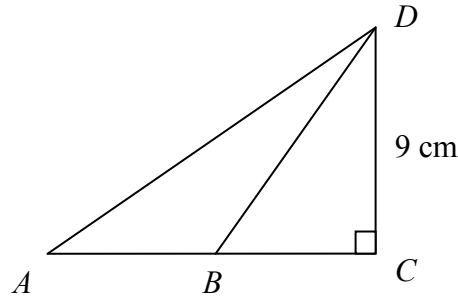
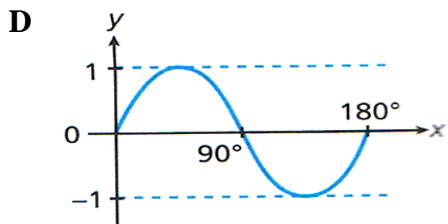
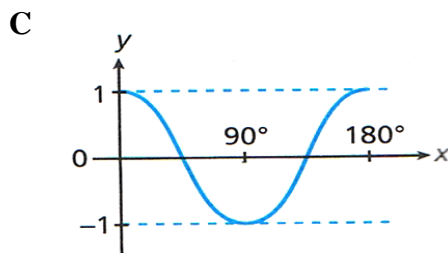
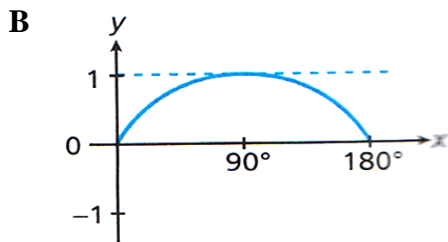
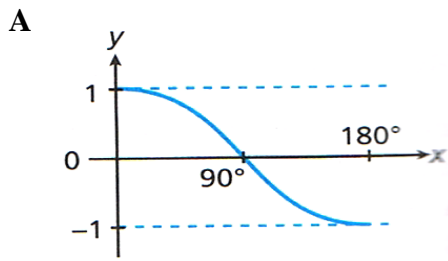


Diagram 11
Rajah 11

Find AD .
Cari AD .

- A 12 cm
 - B 15 cm
 - C 25 cm
 - D 33 cm
- 12 Given $\cos x^\circ = -0.5983$ and $180^\circ \leq x \leq 270^\circ$, the value of x is
Diberi $\cos x^\circ = -0.5983$ dan $180^\circ \leq x \leq 270^\circ$, nilai bagi x ialah
- A $126^\circ 45'$
 - B $216^\circ 45'$
 - C $233^\circ 15'$
 - D $233^\circ 25'$

- 13 Which of the following graphs represents $y = \cos x$ for $0^\circ < x < 180^\circ$?
Antara yang berikut, yang manakah mewakili graf $y = \cos x$ bagi $0^\circ < x < 180^\circ$?



- 14 Diagram 14 shows a cuboid.
Rajah 14 menunjukkan sebuah kuboid.

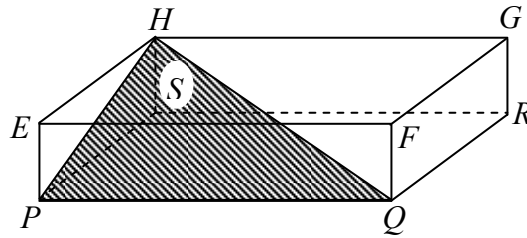


Diagram 14
Rajah 14

Name the angle between the plane PQH and the plane $PQRS$.
Namakan sudut di antara satah PQH dengan satah $PQRS$.

- A $\angle SPH$
 B $\angle SHP$
 C $\angle QSP$
 D $\angle QHP$
- 15 In Diagram 15, AB and CDG are two lamp posts. B and G are two points on the horizontal ground. $ABDG$ is a rectangle.
Dalam Rajah 15, AB dan CDG ialah dua batang tiang lampu. B dan G terletak pada satah mengufuk. $ABDG$ ialah sebuah segiempat tepat.

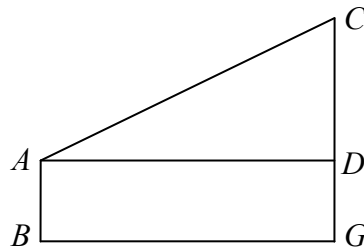


Diagram 15
Rajah 15

The angle of elevation of C from A is
Sudut dongakan C dari A ialah

- A $\angle ACG$
 B $\angle CAD$
 C $\angle ACD$
 D $\angle BCG$

- 16 In Diagram 16, A and B are two points on the horizontal ground. BCD is a building. Given that the angle of elevation of C from A is 38° and the angle of elevation of D from A is 55° .

Dalam Rajah 8, A dan B ialah dua titik pada permukaan mengufuk. BCD ialah sebuah bangunan. Diberi sudut dongakan C dari A ialah 38° dan sudut dongakan D dari A ialah 55° .

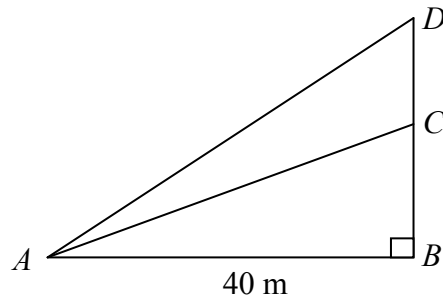


Diagram 17
Rajah 17

Calculate the distance, in m, of CD
Kira jarak, dalam m, bagi CD .

- A 8.14
- B 8.58
- C 25.87
- D 28.26

- 17 In Diagram 17, N lies to the east of M . Given $MP = NP$.
 Dalam Rajah 17, N terletak ke timur M . Diberi $MP = NP$.

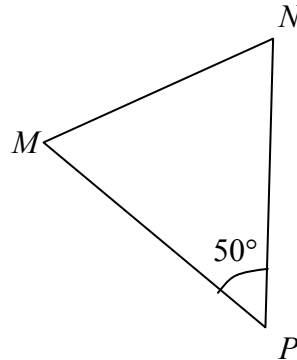


Diagram 17
 Rajah 17

Find the bearing of P from N .
 Cari bearing P dari N .

- A 050°
 B 205°
 C 230°
 D 245°
- 18 $P(25^\circ\text{N}, 10^\circ\text{E})$ and Q are two points on the earth's surface. Q is due south of P . The distance between P and Q is 2400 nautical miles. The latitude of Q is
 $P(25^\circ\text{N}, 10^\circ\text{E})$ dan Q ialah titik pada permukaan bumi. Q terletak ke selatan P . Jarak antara P dan Q ialah 2400 batu nautika. Latitud bagi Q ialah
- A 15°N
 B 65°N
 C 65°S
 D 15°S
- 19 Simplify $5mn - 3(1 - mn)$.
 Ringkaskan $5mn - 3(1 - mn)$.
- A $2mn - 3$
 B $3mn + 3$
 C $8mn - 3$
 D $8mn + 3$

- 20 Express $\frac{p}{3} - \frac{2(p^2 - 3)}{9p}$ as a single fraction in its simplest form.

Ungkapkan $\frac{p}{3} - \frac{2(p^2 - 3)}{9p}$ sebagai pecahan tunggal dalam bentuk yang teringkas.

A $\frac{p^2 + 6}{9p}$

B $\frac{p^2 - 6}{9p}$

C $\frac{6 - p^2}{9p}$

D $\frac{3 - 2p^2}{9p}$

- 21 Given that $R = 4\sqrt{\frac{1+S}{T}}$, express S in terms of R and T .

Diberi bahawa $R = 4\sqrt{\frac{1+S}{T}}$, ungkapkan S dalam sebutan R dan T .

A $\frac{R^2T}{4} - 1$

B $\frac{R^2T}{16} - 1$

C $\frac{R^2T}{4} + 1$

D $\frac{R^2T}{16} + 1$

- 22 Given that $7 - p = 4(1 - 2p)$, calculate the value of p .

Diberi bahawa $7 - p = 4(1 - 2p)$, hitung nilai p .

A $\frac{8}{7}$

B $\frac{3}{7}$

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

D $-\frac{8}{7}$

23 $y^{-6} \times 2y^4 =$

- A $2y^{-2}$
- B $2y^{-1}$
- C $2y^9$
- D $2y^{10}$

24 Simplify $(3 \times 8^{\frac{1}{3}})^3 \div (27^{\frac{2}{3}} \times 32^{\frac{1}{5}})$

Permudahkan $(3 \times 8^{\frac{1}{3}})^3 \div (27^{\frac{2}{3}} \times 32^{\frac{1}{5}})$

- A 2
- B 3
- C 12
- D 24

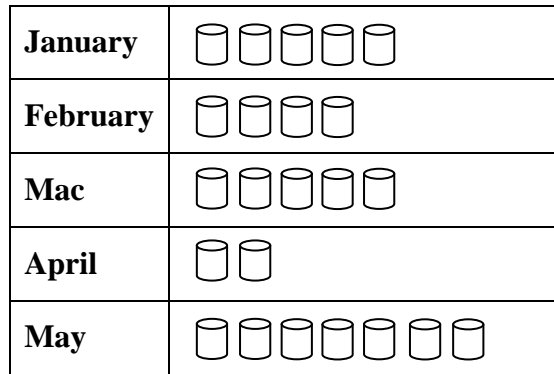
25 Given that $4p - 7 < 9$ and $1 - \frac{1}{2}p \leq 2$, one of the solutions for the simultaneous linear inequalities is

Diberi bahawa $4p - 7 < 9$ dan $1 - \frac{1}{2}p \leq 2$, satu penyelesaian untuk ketaksamaan serentak linear ini adalah

- A -3
- B 3
- C 4
- D 6

26 Diagram 26 is a pictograph which shows the amount of palm oil exported by Malaysia in 5 months.

Rajah 26 ialah piktograf yang menunjukkan jumlah minyak kelapa sawit yang dieksport oleh Malaysia dalam masa 5 bulan



 Represents 500 tonne
Mewakili 500 ton

Diagram 26
Rajah 26

The total amount of palm oil exported before April is
Jumlah minyak kelapa sawit yang di eksport sebelum April ialah

- A 1200 tonne
- B 2500 tonne
- C 6000 tonne
- D 7000 tonne

- 27 Table 27 is a frequency table which shows the mass of fish caught by 20 fishermen.
Jadual 27 ialah jadual kekerapan yang menunjukkan jisim ikan yang ditangkap oleh 20 orang nelayan.

Mass of fish caught (kg) <i>Jisim ikan ditangkap (kg)</i>	Frequency <i>Kekerapan</i>
11 – 13	7
14 – 16	x
17 – 19	2
20 – 22	2
23 – 25	5

Table 27
Jadual 27

Given that the mean mass of fish caught by the fisherman is 17.1 kg, find the value of x .

Diberi min jisim ikan yang ditangkap oleh nelayan adalah 17.1 kg, cari nilai x .

- A 2
- B 3
- C 4
- D 5

- 28 Diagram 28 shows the graph of a function.
Rajah 28 menunjukkan graf bagi satu fungsi.

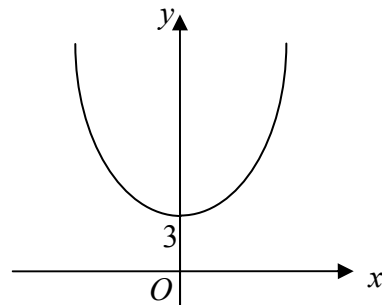


Diagram 28
Rajah 28

The equation that represents this function is
Persamaan yang mewakili fungsi tersebut adalah

- A $y = x^2 + 3$
 B $y = (x + 3)^2$
 C $y = x^2 - 3$
 D $y = (x - 3)^2$
- 29 It is given that the universal set, $\xi = \{x : 10 \leq x \leq 21, x \text{ is an integer}\}$ and set $R = \{x : x \text{ is a number such that the sum of two digits is an odd number}\}$.
Find set R^c .
*Diberi bahawa set semesta $\xi = \{x : 10 \leq x \leq 21, x \text{ ialah integer}\}$, dan set $R = \{x : x \text{ ialah nombor dengan keadaan hasil tambah dua digitnya ialah nombor ganjil}\}$.
Carikan set R^c*
- A $\{10,12,14,16,18,20\}$
 B $\{11, 13, 15, 17, 19, 21\}$
 C $\{10, 11, 13, 15, 17, 19,\}$
 D $\{11, 13, 15,17,19,20\}$

- 30 Diagram 30 is a Venn diagram with the universal set $\xi = P \cup Q \cup R$.
Rajah 30 ialah gambar rajah Venn dengan set semesta $\xi = P \cup Q \cup R$.

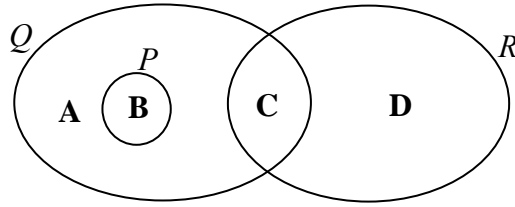


Diagram 30

Rajah 30

Which of the region, **A**, **B**, **C** or **D**, represents the set $(P \cup Q') \cap R$.

*Antara kawasan **A**, **B**, **C** atau **D**, yang manakah mewakili set $(P \cup Q') \cap R$.*

- 31 Venn diagram in Diagram 31 shows three sets F , G and H .
Gambar rajah Venn dalam Rajah 31 menunjukkan tiga set F , G dan H .

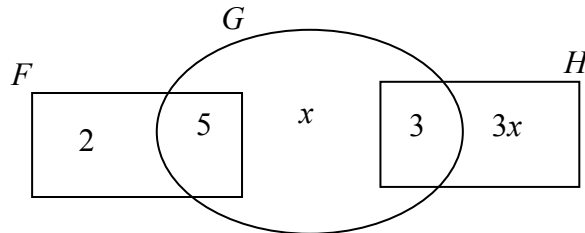


Diagram 31

Rajah 31

Given the universal set $\xi = F \cup G \cup H$ and $n(F \cup G)' = n(G)$ the value of x is
Diberi set semesta $\xi = F \cup G \cup H$ dan $n(F \cup G)' = n(G)$, nilai x ialah

- A** 1
B 4
C 7
D 9

32 State the y -intercept of the straight line $2x - 3y + 18 = 0$.
Nyatakan pintasan- y bagi garis lurus $2x - 3y + 18 = 0$

- A 6
- B -6
- C 9
- D 18

33 Diagram 33 shows a straight line PQ on a Cartesian plane.
Rajah 33 menunjukkan garis lurus PQ pada suatu satah Cartesian.

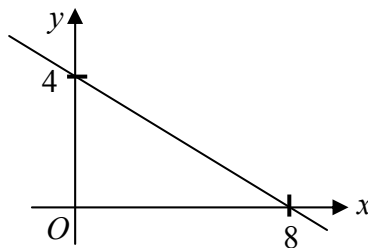


Diagram 33
Rajah 33

Find the gradient of PQ .
Cari kecerunan PQ .

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

- 34 The probability of a football team to loose or draw in a match is $\frac{1}{3}$ and $\frac{1}{5}$. How many games will the team win if they play 45 matches?

Kebarangkalian satu pasukan bola sepak untuk kalah atau seri dalam satu perlawanan adalah $\frac{1}{3}$ dan $\frac{1}{5}$. Berapa bilangan permainan yang akan dimenangi oleh pasukan itu sekiranya mereka bermain dalam 45 perlawanan?

- A 9
B 15
C 21
D 24
- 35 In a group of 100 college students, 80 are boys. In the second intake 20 more girls join the college. If a student is chosen at random from the college, state the probability that the student chosen is a girl.

Dalam satu kumpulan 100 orang pelajar kolej, 80 orang daripadanya adalah perempuan. Dalam pengambilan kedua 20 orang pelajar perempuan lagi mendaftar di kolej itu. Jika seorang pelajar dipilih secara rawak daripada kolej itu, nyatakan kebarangkalian bahawa pelajar yang dipilih adalah perempuan.

- A $\frac{1}{6}$
B $\frac{1}{5}$
C $\frac{1}{3}$
D $\frac{5}{6}$

- 36 The mass, m gm of weight is hung to a spring varies directly to its expansion, x cm. Given that when the mass of the weight is 50 gm, its expansion is 5 cm, find the expansion of the spring when the mass of the weight is 150 gm.

Jisim, m gm bagi satu pemberat yang tergantung pada satu spring adalah berubah secara langsung dengan pemanjangan spring itu, x cm. Diberi bahawa apabila jisim pemberat adalah 50 gm, pemanjangan spring adalah 5 cm, cari pemanjangan spring bila jisim pemberat adalah 150 gm.

- A 5 cm
B 10 cm
C 15 cm
D 20 cm
- 37 Table 37 shows some values of the variables p , q , and r , which satisfy the relationship $p \propto q^2 r$.
Jadual 37 menunjukkan sebahagian daripada nilai-nilai bagi pemboleh ubah p , q dan r , yang memuaskan hubungan $p \propto q^2 r$.

p	-18	8
q	3	a
r	-1	1

Table 37
Jadual 37

Calculate the value of a .
Find the value of a .

- A 2
B 4
C 16
D 32

- 38 Table 38 shows the values of p , q and r .
Jadual 38 menunjukkan nilai-nilai bagi p , q dan r .

p	8	7.2	0.5
q	3	3	18
r	4	3.6	1.5

Table 38
Jadual 38

The relation between r , p and q is
Hubungan di antara r , p dan q adalah

- A $r = \frac{1}{6}pq$
 B $r = 6pq$
 C $r = 6\frac{p}{q}$
 D $r = \frac{6}{pq}$

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

- A $\begin{pmatrix} -5 & 3 \\ 14 & 6 \end{pmatrix}$
 B $\begin{pmatrix} 5 & 3 \\ 14 & 6 \end{pmatrix}$
 C $\begin{pmatrix} 5 & 5 \\ 14 & 8 \end{pmatrix}$
 D $\begin{pmatrix} -5 & 5 \\ 14 & 8 \end{pmatrix}$

40 Given $\begin{pmatrix} 3 & 2 \\ 4 & 4 \end{pmatrix} \begin{pmatrix} 2 \\ 1 \end{pmatrix} - \begin{pmatrix} x \\ 3 \end{pmatrix} = \begin{pmatrix} 4 \\ 7 \end{pmatrix}$, find the value of x .

Diberi $\begin{pmatrix} 3 & 2 \\ 4 & 4 \end{pmatrix} \begin{pmatrix} 2 \\ 1 \end{pmatrix} - \begin{pmatrix} x \\ 3 \end{pmatrix} = \begin{pmatrix} 4 \\ 7 \end{pmatrix}$, cari nilai x .

- A -2
- B 2
- C 4
- D 6

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of **40** question.
Kertas soalan ini mengandungi 40 soalan.
2. Answer **all** question.
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 4.
Satu senarai rumus disediakan di halaman 2 hingga 4.
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 deprogram.

SULIT

NAMA :

TINGKATAN :



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA.**

**PEPERIKSAAN PERCUBAAN SPM SELARAS SBP 2010
SIJIL PELAJARAN MALAYSIA
MATHEMATIK**

1449/2

**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*

<i>Pemeriksa</i>			
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 29 halaman bercetak.

MATHEMATICAL FORMULAE
RUMUS MATEMATIK

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

RELATIONS
PERKAITAN

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

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 = $\pi d = 2\pi j$
- 3 Area of circle = πr^2
Luas bulatan = πj^2
- 4 Curved surface area of cylinder = $2\pi r h$
Luas permukaan melengkung silinder = $2\pi j t$
- 5 Surface area of sphere = $4\pi r^2$
Luas permukaan sfera = $4\pi j^2$
- 6 Volume of right prism = cross sectional area \times length
Isipadu prisma tegak = luas keratan rentas \times panjang
- 7 Volume of cylinder = $\pi r^2 h$
Isipadu silinder = $\pi j^2 t$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
Isipadu kon = $\frac{1}{3} \pi j^2 t$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
Isipadu sfera = $\frac{4}{3} \pi j^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
Isipadu piramid tegak = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$

- 11 Sum of interior angles of a polygon

Hasil tambah sudut pedalaman poligon

$$= (n - 2) \times 180^\circ$$

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

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

- 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, $k = \frac{PA'}{PA}$

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

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

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

**BLANK PAGE
HALAMAN KOSONG**

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

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

1 The Venn diagram below shows sets P , Q , and R . Given that the universal set $\xi = P \cup Q \cup R$.

Shade the region representing

Gambarajah Venn di bawah menunjukkan set P , Q dan R . Di beri set semesta $\xi = P \cup Q \cup R$.

Lorekkan kawasan yang mewakili

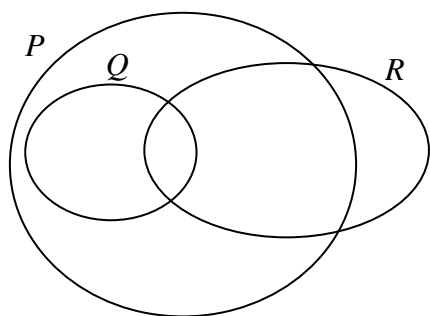
(i) $Q' \cap R$

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

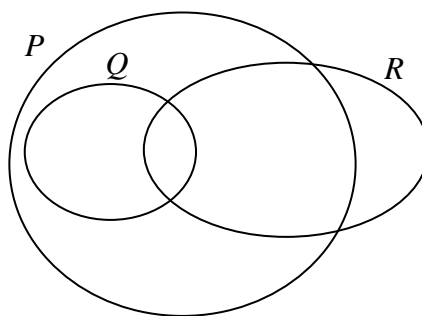
[3 marks]
[3 markah]

Answer/ Jawapan:

(i)



(ii)



- 2 Solve the following quadratic equation:
Selesaikan persamaan kuadratik berikut :

$$\frac{1}{2}(3x^2 - x) = 1 - 3x.$$

[4 marks]
[4 markah]

Answer/Jawapan :

-
- 3 Calculate the value of x and y that satisfy the following simultaneous linear equations:
Hitung nilai x dan nilai y yang memuaskan persamaan linear serentak berikut :

$$3x - 4y = 3$$

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

[4 marks]
[4 markah]

Answer/Jawapan :

- 4 Diagram 4 shows a right prism with a horizontal rectangular base $ABCD$. $EFGH$ is a square. The plane $EDCH$ is vertical and the uniform cross-section of the prism is the trapezium $GHCB$. K is the midpoint of ED .

Rajah 4 menunjukkan sebuah prisma tegak dengan satah mengufuk $ABCD$. $EFGH$ ialah sebuah segiempat sama. Satah $EDCH$ adalah tegak dan trapezium $GHCB$ ialah keratan rentas seragam prisma. K ialah titik tengah ED .

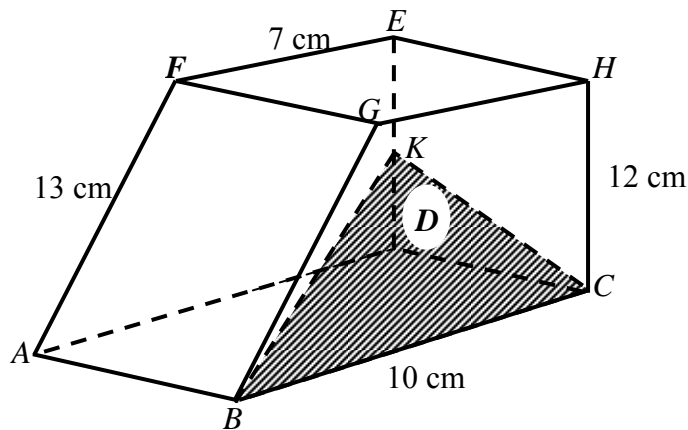


Diagram 4
Rajah 4

- (a) Name the angle between the plane BCK and the base $ABCD$.
Namakan sudut di antara satah BCK dengan satah $ABCD$.
- (b) Calculate the angle between the plane BCK and the base $ABCD$.
Hitungkan sudut di antara satah BCK dengan satah $ABCD$.

[4 marks]
[4 markah]

Answer :

(a)

(b)

- 5 (a) Write two implications base on the sentence below.
Tulis dua implikasi berdasarkan pernyataan berikut.

“ $P \not\subset Q$ if and only if $P \cap Q = \emptyset$ ”
 “ $P \not\subset Q$ jika dan hanya jika $P \cap Q = \emptyset$ ”

- (b) Complete the following argument:
Lengkapkan hujah berikut:

Premise 1 : If $n = 2$, then $x^n + x$ is a quadratic expression.
Premis 1 : Jika $n = 2$, then $x^n + x$ ialah suatu ungkapan kuadratik.

Premise 2 : $x^n + x$ is not a quadratic expression.
Premis 2 : $x^n + x$ bukan suatu ungkapan kuadratik.

Conclusion : _____

Kesimpulan : _____

- (c) Make a general conclusion by induction for the number sequence 7, 22, 47, 82, ... which follows the following pattern.
Buat satu kesimpulan umum secara aruhan bagi urutan nombor 7, 22, 47, 82,...yang mengikut pola berikut.

$$\begin{aligned} 7 &= 5(1) + 2 \\ 22 &= 5(4) + 2 \\ 47 &= 5(9) + 2 \\ 82 &= 5(16) + 2 \\ &\dots\dots\dots \end{aligned}$$

[5 marks]
[5 markah]

Answer/Jawapan :

(a)

(b) Conclusion/Kesimpulan :

(c)

- 6 Diagram 6 shows a cone with diameter 18 cm and height 21 cm. A cube of 6 cm sides is taken out of the cone.

Rajah 6 menunjukkan sebuah kon dengan diameter 18 cm dan tinggi 21 cm. Sebuah kiub dengan sisi 6 cm dikeluarkan dari kon tersebut.

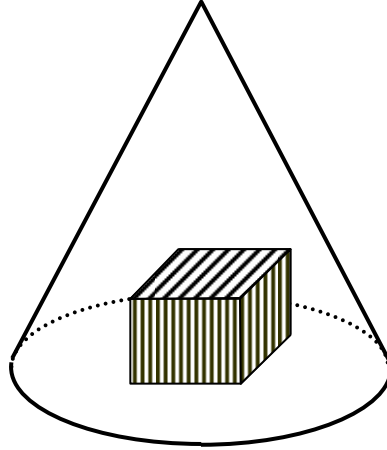


Diagram 6
Rajah 6

Using $\pi = \frac{22}{7}$, calculate the volume, in cm^3 , of the remaining solid.

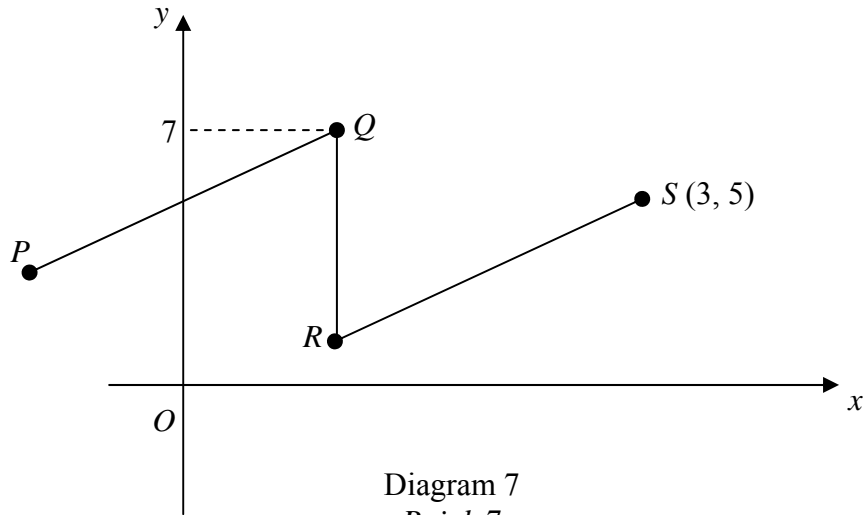
Dengan menggunakan $\pi = \frac{22}{7}$, hitungkan isi padu, dalam cm^3 , pepejal yang tinggal.

[4 marks]

[4 markah]

Answer/Jawapan :

- 7 In Diagram 7, O is the origin. Straight line PQ is parallel to straight line RS and straight line QR is parallel to y -axis. The equation of the straight line PQ is $y = 2x + 5$.
Dalam Rajah 7, O ialah asalan. Garis lurus PQ adalah selari dengan garis lurus RS dan garis lurus QR adalah selari dengan paksi- y . Persamaan garis lurus PQ ialah $y = 2x + 5$.



- (a) State the equation of the straight line QR .
Nyatakan persamaan garis lurus QR .
- (b) Find the equation of the straight line RS .
Carikan persamaan garis lurus RS .

[5 marks]
 [5 markah]

Answer/Jawapan :

(a)

(b)

8 (a) Given that $M \begin{pmatrix} 2 & -4 \\ -2 & 5 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, find matrix M .

Diberi $M \begin{pmatrix} 2 & -4 \\ -2 & 5 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, cari matrix M .

(b) Write the following simultaneous linear equations as matrix equation.
Tulis persamaan linear serentak berikut dalam bentuk persamaan matriks.

$$\begin{aligned} 2p - 4q &= -6 \\ -2p + 5q &= 8 \end{aligned}$$

Hence, using matrix method, calculate the value of p and q .
Seterusnya, dengan menggunakan kaedah matriks, hitungkan nilai p dan nilai q .

[6 marks]
[6 markah]

Answer/Jawapan:

(a)

(b)

- 9 In Diagram 9, AC is the diameter of a semicircle ABC with centre O and EC is the diameter of semicircle EDC . BFO is an arc of circle with centre A and E is the midpoint of OC . $AC = 28$ cm.

Dalam Rajah 9, AC ialah diameter bagi semibulatan ABC berpusat O dan EC adalah diameter bagi semibulatan EDC . BFO ialah lengkuk bulatan berpusat A dan E adalah titik tengah OC . $AC = 28$ cm.

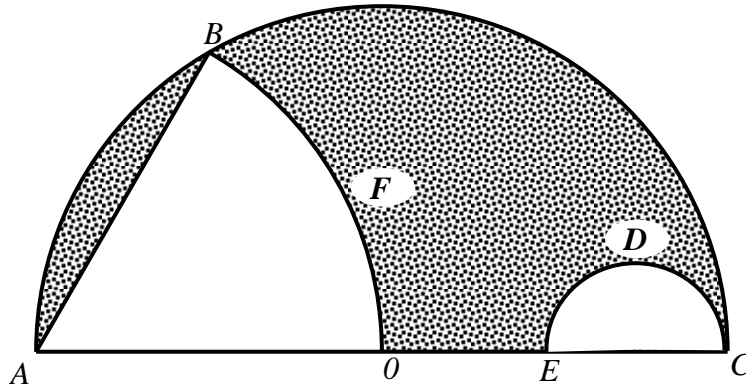


Diagram 9
Rajah 9

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

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

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

[6 marks]
[6 markah]

Answer/Jawapan:

(a)

(b)

- 10 Diagram 10 shows a speed-time graph for the movement of a particle for a period of 45 seconds.
Rajah 10 menunjukkan menunjukkan graf laju-masa bagi suatu zarah dalam tempoh 45 saat.

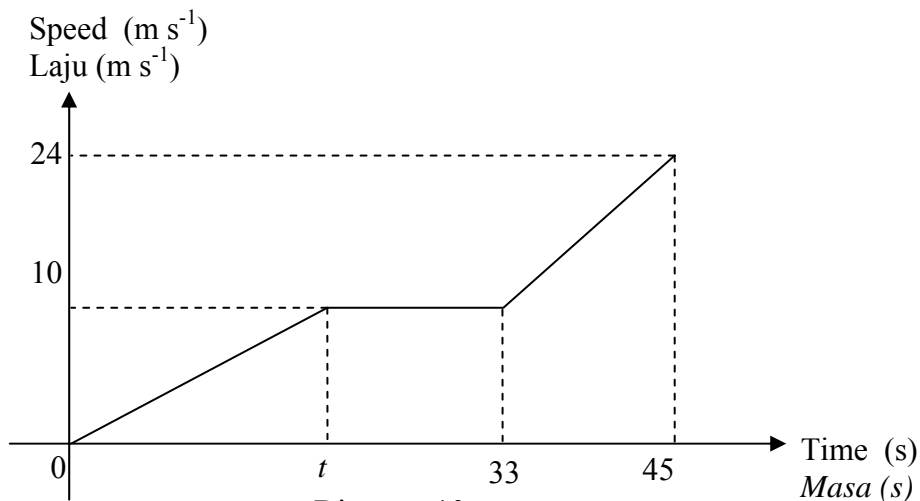


Diagram 10
Rajah 10

- (a) Given that the distance travelled by uniform speed is 140 m.
Calculate the value of t .
*Diberi bahawa jarak dilalui dengan laju seragam ialah 140 m.
Hitungkan nilai t .*
- (b) Calculate the rate of change of speed, in m s^{-2} , of the particle in the last 12 seconds.
Hitungkan kadar perubahan laju, dalam ms^{-2} , zarah itu dalam 12 saat terakhir.
- (c) Calculate the total distance travelled by the particle.
Hitungkan jumlah jarak yang dilalui oleh zarah itu.

[6 marks]
[6 markah]

Answer/Jawapan:

(a)

(b)

(c)

- 11 Diagram 11 shows a set of cards labeled with letters in Box *P* and a set of cards labeled with numbers in Box *Q*
Rajah 11 menunjukkan satu set kad berlabel dengan huruf di dalam kotak P dan satu set kad berlabel dengan nombor di dalam Kotak Q.

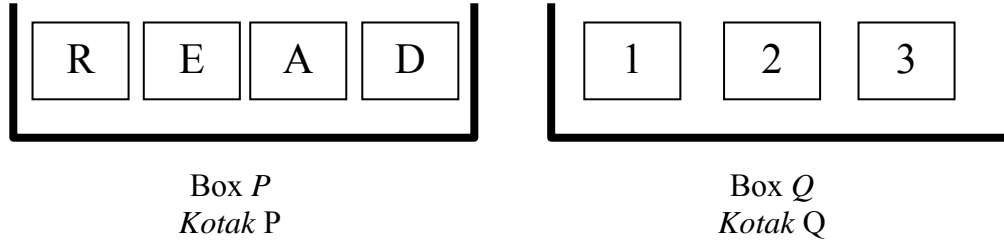


Diagram 11
Rajah 11

A card is picked at random from each of the boxes.
Sekeping kad dipilih secara rawak daripada setiap kotak itu.

- (a) List the sample space.
Senaraikan ruang sampel.
- (b) List all the outcomes of events and find the probability that
Senaraikan semua kesudahan peristiwa dan cari kebarangkalian bahawa
- (i) one of the cards picked is labelled with a vowel.
satu kad yang dipilih berlabel huruf vokal.
- (ii) a card labelled R and a card with a prime number are picked.
satu kad berlabel R dan satu kad nombor perdana dipilih.

[5 marks]
 [5 markah]

Answer/Jawapan:

- (a)
- (b) (i)
- (ii)

Section B
Bahagian B

[48 marks]
[48 markah]

Answer any **four** questions in this section.
Jawab empat soalan di bahagian ini.

- 12 (a)** Complete Table 12 in the answer space for the equation $y = x^3 - 4x - 5$ by writing down the values of y when $x = -2$ and $x = 3$.
Lengkapkan Jadual 12 di ruang jawapan bagi persamaan $y = x^3 - 4x - 5$ dengan menulis nilai-nilai y apabila $x = -2$ dan $x = 3$.

[2 marks]
[2 markah]

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

By using the scale of 2 cm to 1 unit on the x -axis and 2 cm to 5 units on the y -axis, draw the graph of $y = x^3 - 4x - 5$ for $-3 \leq x \leq 3.5$.

Dengan menggunakan skala 2 cm kepada 1 unit pada paksi- x dan 2 cm kepada 5 unit pada paksi- y , lukis graf $y = x^3 - 4x - 5$ bagi $-3 \leq x \leq 3.5$.

[4 marks]
[4 markah]

- (c)** By using the graph drawn in **12(b)**, find
*Dengan menggunakan graf yang dilukis di **12(b)**, cari*

(i) the value of y when $x = 1.5$,
nilai y apabila $x = 1.5$,

(ii) the value of x when $y = 5$.
nilai x apabila $y = 5$.

[2 marks]
[2 markah]

- (d)** Draw a suitable straight line on your graph to find all the values of x which satisfy the equation $x^3 - 9x + 5 = 0$ for $-3 \leq x \leq 3.5$.
State these values of x .

*Lukis satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai x yang memuaskan persamaan $x^3 - 9x + 5 = 0$ bagi $-3 \leq x \leq 3.5$.
Nyatakan nilai-nilai x itu.*

[4 marks]
[4 markah]

Answer/Jawapan:

(a)

x	-3	-2.5	-2	-1	0	1	2	3	3.5
y	-20	-10.6		-2	-5	-8	-5		23.9

Table 12
Jadual 12(b) Refer graph provided.
Rujuk graf yang disediakan.(c) (i) $y = \dots\dots\dots$ (ii) $x = \dots\dots\dots$ (d) $x = \dots\dots\dots, \dots\dots\dots$

- 13 Diagram 13.1 shows the point $A(7, 5)$ and point P drawn on a Cartesian plane.
Rajah 13.1 menunjukkan titik $A(7, 5)$ dan titik P dilukis pada suatu satah Cartesian.

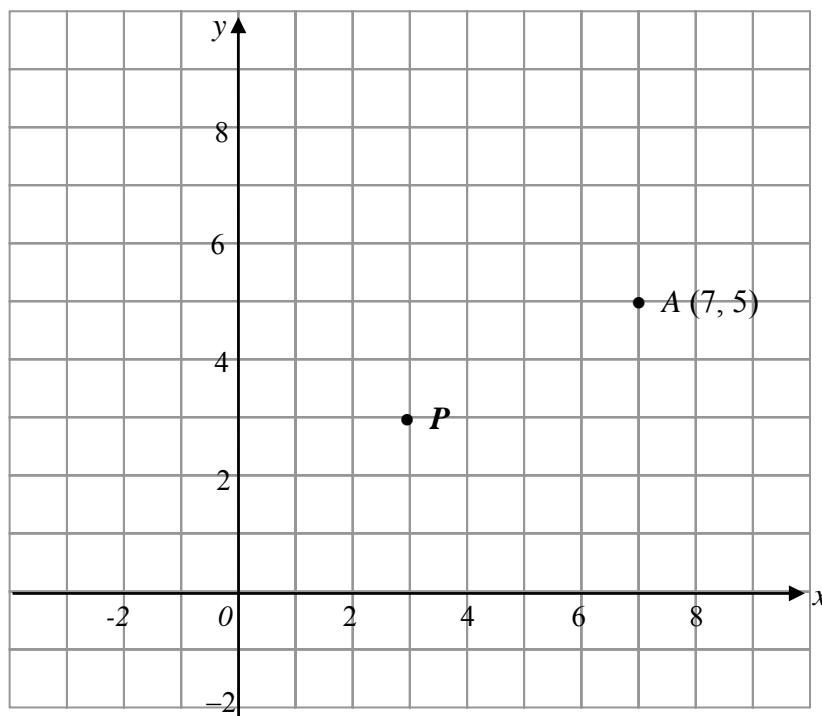


Diagram 13.1
Rajah 13.1

- (a) Transformation \mathbf{T} is a translation $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$ and transformation \mathbf{R} is an anticlockwise rotation of 90° about the centre P .
State the coordinates of the image of point $A(7, 5)$ under each of the following transformations:

Penjelmaan \mathbf{T} ialah translasi $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$ dan penjelmaan \mathbf{R} ialah putaran 90° lawan arah jam berpusat di P .

Nyatakan koordinat imej bagi titik $A(7, 5)$ di bawah penjelmaan berikut:

- (i) \mathbf{T} ,
(ii) \mathbf{TR} .

[4 marks]
[4 markah]

- (b) Diagram 13.2 shows three pentagons, $ABCDE$, $FGHIJ$ and $FKLMN$, drawn on a Cartesian plane.

Rajah 13.2 menunjukkan tiga pentagon $ABCDE$, $FGHIJ$ dan $FKLMN$, dilukis pada suatu satah Cartesian.

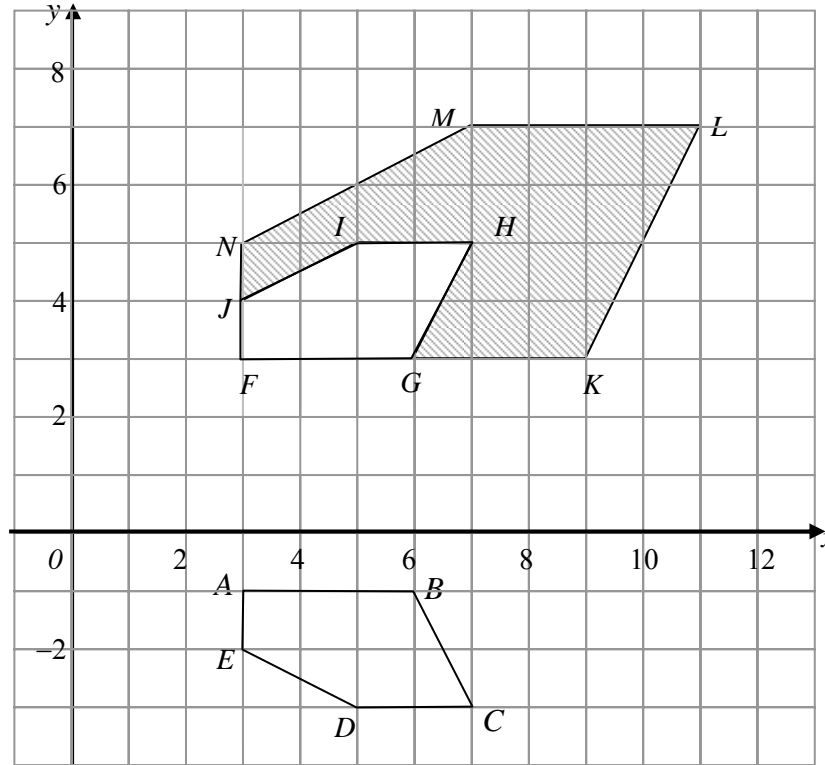


Diagram 13.2

Rajah 13.2

- (i) $FKLMN$ is the image of $ABCDE$ under a combined transformation VU .
 $FKLMN$ ialah imej bagi $ABCDE$ di bawah gabungan penjelmaan VU .

Describe in full the transformation
Huraikan selengkapnya penjelmaan

- (a) U ,
(b) V .

- (ii) It is given that the area of the shaded region is 112.5 m^2 . Calculate the area, in m^2 , of the pentagon $ABCDE$.
Diberi bahawa luas kawasan berlorek ialah 112.5 m^2 . Hitung luas, dalam m^2 , pentagon $ABCDE$.

[8 marks]
[8 markah]

Answer/Jawapan :

(a) (i)

(ii)

(b) (i) (a)

(b)

(ii)

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

- (a) Diagram 14.1 shows a solid right prism with a rectangular base $JKQR$ on a horizontal plane. The surface $KQPL$ is the uniform cross-section of the prism. The rectangle $MLPN$ is an inclined plane. KL and QP are vertical edges.
Rajah 14.1 menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segi empat tepat $JKQR$ terletak di atas satah mengufuk. Permukaan $KQPL$ ialah keratan rentas seragam prisma itu. Segi empat tepat $MLPN$ ialah satah condong. Tepi KL dan QP adalah tegak.

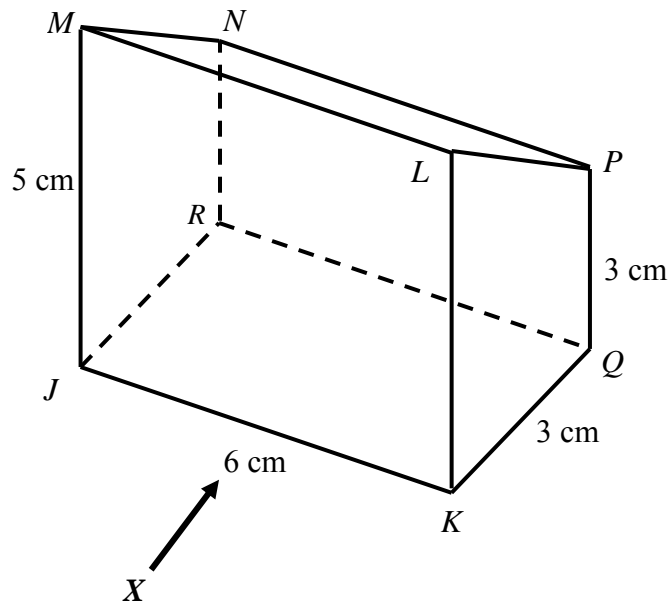


Diagram 14.1
Rajah 14.1

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

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

[3 marks]
[3 markah]

Answer/Jawapan:

14. (a)

- (b) Another solid right prism with trapezium $WVUT$ as the cross-section is joined to the prism in Diagram 14.1 at the vertical plane $RQPN$. The composite solid is shown in Diagram 14.2. The base $JKQVWR$ is on a horizontal plane and rectangle $SPUT$ is an inclined plane.

Sebuah pepejal lain berbentuk prisma tegak dengan trapezium $WVUT$ sebagai keratan rentas seragam dicantumkan kepada prisma dalam Rajah 14.1 pada satah mencancang $RQPN$. Gabungan pepejal adalah seperti yang ditunjukkan dalam Rajah 14.2. Tapak $JKQVWR$ terletak di atas satah mengufuk dan segi empat tepat $SPUT$ ialah satah condong.

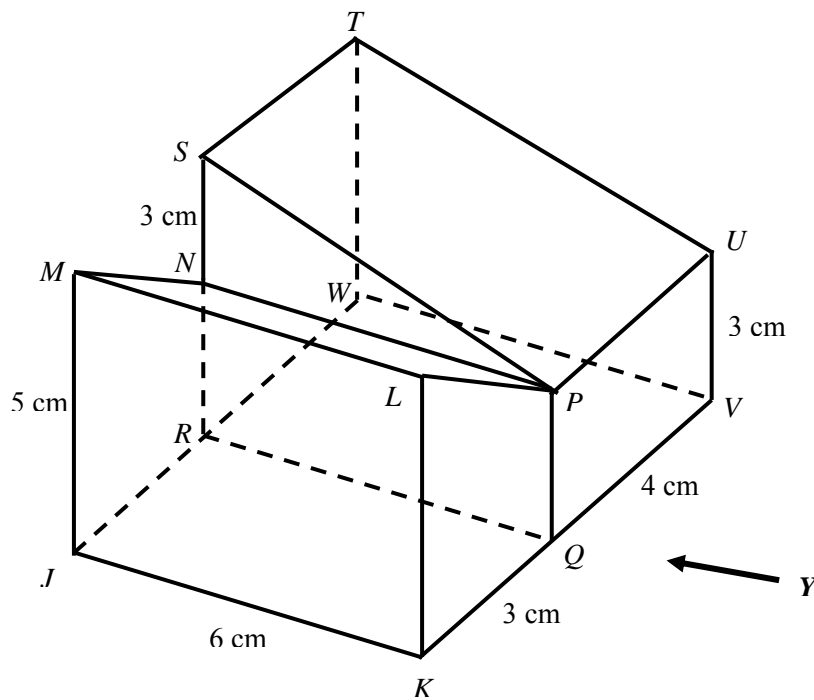


Diagram 14.2
Rajah 14.2

Draw to full scale,
Lukis dengan skala penuh,

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

Answer/Jawapan :

(b) (i)

(ii)

- 15** The data in Diagram 15 shows the score of 40 participants in a written Mathematics quiz competition.

Data dalam Rajah 15 menunjukkan skor yang diperolehi oleh 40 orang peserta dalam suatu pertandingan kuiz Matematik secara bertulis.

25	26	34	45	33	30	39	32
40	43	17	48	37	42	37	43
31	37	36	35	29	31	33	23
45	28	44	36	50	39	27	40
34	39	24	30	38	34	44	35

Diagram 15
Rajah 15

- (a) Based on the data in Diagram 15, complete Table 15 in the answer space. [3 marks]
Berdasarkan data di Rajah 15, lengkapkan Jadual 15 di ruang jawapan. [3 markah]

Based on Table 15, calculate the estimated mean of the score obtained by a participant. [3 marks]
Berdasarkan Jadual 15, hitung min anggaran skor yang diperolehi oleh peserta. [3 markah]

- (b) For this part of the question, use the graph paper provided. [4 marks]
Untuk ceraiian soalan ini, guna kertas graf yang disediakan. [4 markah]

By using the scale of 2 cm to 5 marks on the horizontal axis and the scale of 2 cm to 5 participants on the vertical axis, draw an ogive for the data.
Dengan menggunakan skala 2 cm kepada 5 markah pada paksi mengufuk dan 2 cm kepada 5 peserta pada paksi mencancang, lukis satu ogif bagi data tersebut. [4 markah]

- (d) Based on the ogive in 15(c), find the interquartile range. [2 marks]
Berdasarkan ogif di 15(c), hitung julat antara kuartil. [2 markah]

Answer/Jawapan:

(a)

Class interval <i>Selang kelas</i>	Frequency <i>Kekerapan</i>	Upper Boundary <i>Sempadan Atas</i>	Cumulative Frequency <i>Kekerapan longgokan</i>
11 – 15			
16 – 20			
21 – 25			
26 – 30			
31 – 35			
36 – 40			
41 – 45			
46 – 50			

Table 15
Jadual 15

(b)

(c) Refer to the provided graph .
Rujuk graf yang disediakan.

(d)

- 16 In Diagram 16, P ($40^{\circ}N$, $58^{\circ}W$), Q , R and X are four points on the surface of the earth. PQ is the diameter of the parallel of latitude of $40^{\circ}N$. X lies 3780 nautical miles due south of R .

Dalam Rajah 16, P ($40^{\circ}U$, $58^{\circ}B$), Q , R dan X ialah empat titik di atas permukaan bumi. PQ ialah diameter selarian latitud $40^{\circ}U$. X terletak 3780 batu nautika ke selatan R .

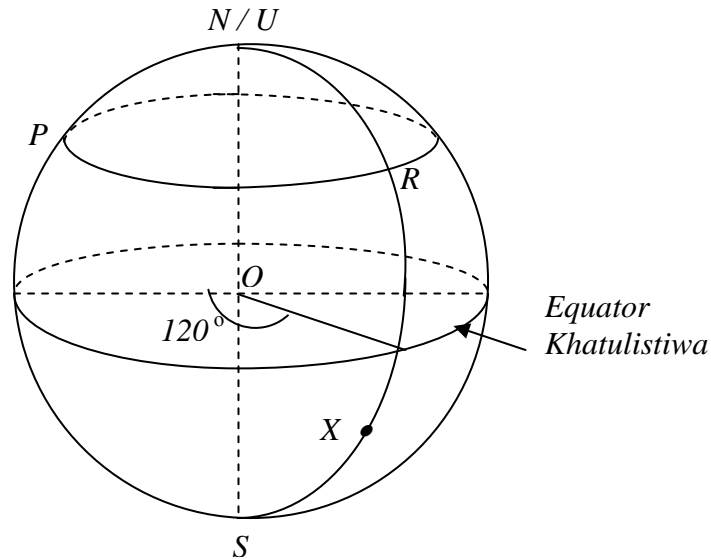


Diagram 16
Rajah 16

- (a) (i) State the longitude of R .
Nyatakan longitud bagi R .
- (ii) State the location of Q .
Nyatakan kedudukan bagi Q .
- [4 marks]
[4 markah]
- (b) Calculate the shortest distance, in nautical mile, from P to Q measured along the surface of the earth.
Hitung jarak terpendek, dalam batu nautika, dari P ke Q diukur sepanjang permukaan bumi.
- [2 marks]
[2 markah]
- (c) Calculate the distance, in nautical mile, from P to R measured along the common parallel of latitude.
Hitung jarak, dalam batu nautika, dari P ke R diukur sepanjang selarian latitud sepunya.
- [3 marks]
[3 markah]

- (d) An aeroplane took off from P and flew due east to R and then flew due south to X . The average speed for the whole flight was 680 knots. Calculate the time, in hours, taken for the whole flight.
Sebuah kapal terbang berlepas dari P arah ke timur ke R dan terbang arah ke selatan ke X . Purata laju seluruh penerbangan itu ialah 680 knot. Hitungkan masa, dalam jam, yang diambil untuk seluruh penerbangan itu.

[3 marks]
[3 markah]

Answer/Jawapan :

(a) (i)

(ii)

(b)

(c)

(d)

**END OF QUESTION PAPER
KERTAS SOALAN TAMAT**

INFORMATION FOR CANDIDATES

1. This question paper consists of two sections: **Section A** and **Section B**.
Kertas soalan ini mengandungi dua bahagian : Bahagian A dan bahagian B.
2. Answer **all** questions in **Section A** and **four** questions from **Section B**.
Jawab semua soalan dalam Bahagian A dan mana-mana empat soalan daripada Bahagian B.
3. Write your answers in the spaces provided in the question paper.
Tulis jawapan 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 baharu.
6. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. The marks allocated for each question and sub-part of a question are shown in brackets.
Markah yang diperuntukkan bagi setiap soalan dan ceraihan soalan ditunjukkan dalam kurungan.
8. A list of formulae is provided on page 2 to 3.
Satu senarai rumus disediakan di halaman 2 hingga 4.
9. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.
10. Hand in this question paper to the invigilator at the end of the examination.
Serahkan kertas soalan ini kepada pengawas peperiksaan pada akhir peperiksaan.



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH
KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010**

SKIMA PERMARKAHAN

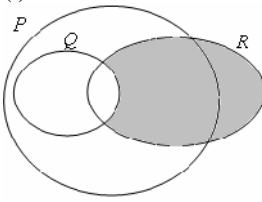
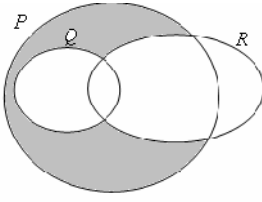
MATEMATIK SPM

KERTAS 1 DAN KERTAS 2

PAPER 1

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

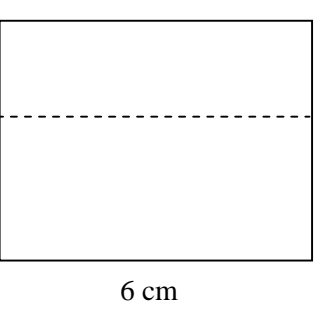
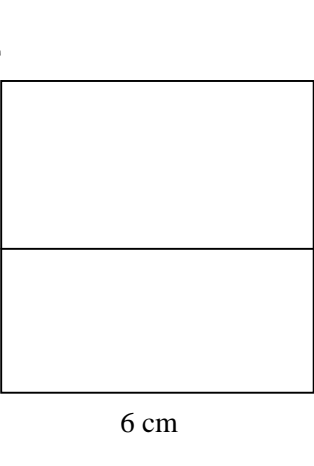
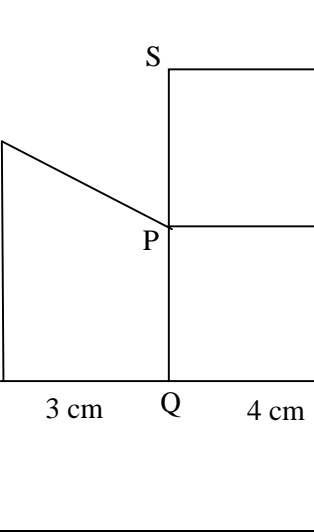
PAPER 2
Section A
[52 marks]

No	Marking Scheme	Marks	
1	<p>(i) </p> <p>(ii) </p>	P1, P2	3
2.	$3x^2 + 5x - 2 = 0$ $(3x - 1)(x + 2) = 0$ $x = \frac{1}{3}, x = -2$	K1 K1 N1N1	4
3.	$6x + 6y = -1 \quad \text{or} \quad 6x - 8y = 6$ $14y = -7$ $y = -\frac{1}{2}$ $x = \frac{1}{3}$	K1 K1 N1 N1	4
4.	<p>(a) $\angle KCD$</p> <p>(b) $\tan \angle KCD = \frac{6}{7}$ $\angle KCD = 40.6^\circ \text{ or } 40^\circ 36'$</p>	P1 K2 N1	4

No	Marking Scheme	Marks					
5.	(a) If $P \not\subset Q$ then $P \cap Q = \emptyset$. If $P \cap Q = \emptyset$ then $P \not\subset Q$. (b) $n \neq 2$ (c) $5n^2 + 2$; $n = 1, 2, 3, \dots$	P1 P1	5				
6.	$\frac{1}{3} \times \frac{22}{7} \times 9^2 \times 21$ $\frac{1}{3} \times \frac{22}{7} \times 9^2 \times 21 - 6 \times 6 \times 6$ 1566	K1		4			
7.	(a) $Q(1,7)$ $x = 1$ (b) $m_{RS} = 2$ $\frac{y-5}{x-3} = 2 \quad \text{or} \quad 5 = 2(3) + c$ $y = 2x - 1$	P1 P1	5				
8.	(a) $M = \frac{1}{2(5) - (-4)(-2)} \begin{pmatrix} 5 & 4 \\ 2 & 2 \end{pmatrix}$ $= \begin{pmatrix} 5/2 & 2 \\ 1 & 1 \end{pmatrix}$ (b) $\begin{pmatrix} 2 & -4 \\ -2 & 5 \end{pmatrix} \begin{pmatrix} p \\ q \end{pmatrix} = \begin{pmatrix} -6 \\ 8 \end{pmatrix}$ $\begin{pmatrix} p \\ q \end{pmatrix} = \frac{1}{2(5) - (-4)(-2)} \begin{pmatrix} 5 & 4 \\ 2 & 2 \end{pmatrix} \begin{pmatrix} -6 \\ 8 \end{pmatrix}$ $= \frac{1}{2} \begin{pmatrix} 2 \\ 4 \end{pmatrix}$ $= \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ $p = 1 \quad q = 2$	K1			N1	P1	K1

No	Marking Scheme	Marks	
9.	<p>(a) $\frac{180}{360} \times 2 \times \frac{22}{7} \times 14$ or $\frac{180}{360} \times 2 \times \frac{22}{7} \times \frac{7}{2}$ or $\frac{60}{360} \times 2 \times \frac{22}{7} \times 14$</p> <p>$\frac{180}{360} \times 2 \times \frac{22}{7} \times 14 + \frac{180}{360} \times 2 \times \frac{22}{7} \times \frac{7}{2} + \frac{60}{360} \times 2 \times \frac{22}{7} \times 14 + 14 + 7$</p> <p>$90\frac{2}{3}$ or 90.67</p> <p>(b) $\frac{180}{360} \times \frac{22}{7} \times 14^2$ or $\frac{180}{360} \times \frac{22}{7} \times (\frac{7}{2})^2$ or $\frac{60}{360} \times 2 \times \frac{22}{7} \times 14^2$</p> <p>$\frac{180}{360} \times \frac{22}{7} \times 14^2 - \frac{180}{360} \times \frac{22}{7} \times (\frac{7}{2})^2 - \frac{60}{360} \times \frac{22}{7} \times 14^2$</p> <p>186.08</p>	K1	
10	<p>(a) $(33 - t)10 = 140$</p> <p>$t = 19$</p> <p>(b) $\frac{24 - 10}{12}$</p> <p>1.17</p> <p>(c) $\frac{1}{2} \times 19 \times 10 + 140 + \frac{1}{2}(10 + 24)12$</p> <p>439</p>	K1 N1 K1 N1 K1 N1	6 6

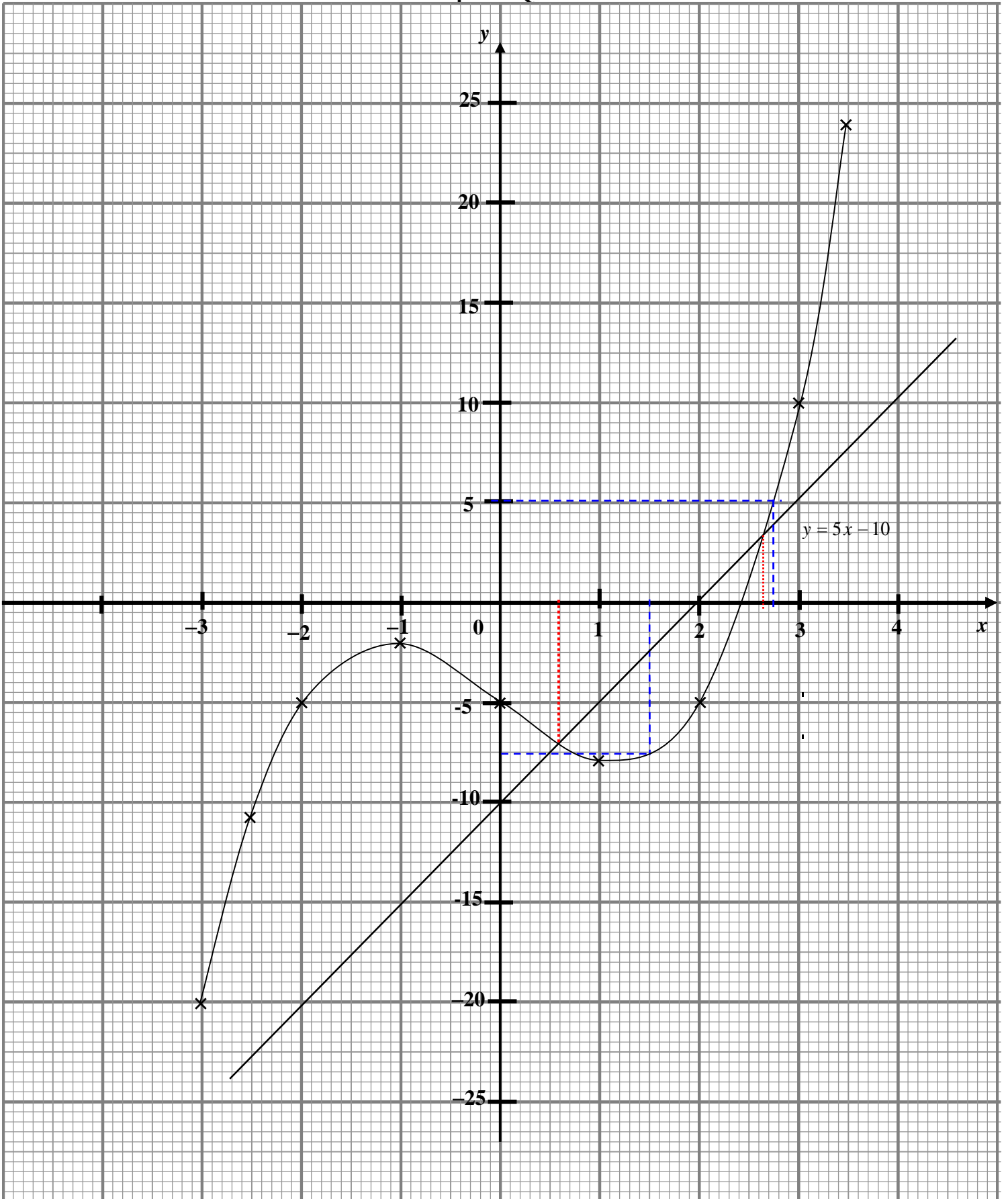
No	Marking Scheme	Marks							
12	<p>(a) <table border="1" data-bbox="435 275 657 352"> <tr> <td>x</td> <td>-2</td> <td>3</td> </tr> <tr> <td>y</td> <td>-5</td> <td>10</td> </tr> </table></p> <p>(b) <u>Graph</u></p> <p>Axes drawn in the correct direction , the uniform scale is in the range given.</p> <p>9 coordinates plotted correctly in the range given.</p> <p>Smooth curve drawn continuously in the range without a straight line at any part and passed through 9 correct coordinates .</p> <p>(c) (i) $y = -7.5 \pm 0.5$</p> <p>(ii) $x = 2.75 \pm 0.1$</p> <p>(d) Identify the equation $y = 5x - 10$ or equivalent. Draw the line $y = 5x - 10$</p> <p>$x = 0.6 \pm 0.1$, 2.6 ± 0.1</p>	x	-2	3	y	-5	10	K1K1	
x	-2	3							
y	-5	10							
13	<p>(a) (i) (4 , 7)</p> <p>(ii) (-2 , 9)</p> <p>(b) (i) U = Reflection in the line $y = 1$</p> <p>(ii) V = Enlargement with scale factor 2 about centre F or (3 ,3)</p> <p>(b) (ii) $2^2(ABCDE) - ABCDE = 112.5$ or $\frac{112.5}{3}$ $37.5 m^2$.</p>	P2 P2 P2 P3 K2 N1	12						

No	Marking Scheme	Marks	
14	<p>(a)</p> 	Correct shape of rectangle JKLM	K1
		Dotted line	K1
		Correct measurement ± 0.2 cm	N1
	<p>(b)(i)</p> 	Correct shape of two rectangle.	K1
		$TU > TS > SM$	K1
		Correct measurement ± 0.2 cm	N2
	<p>(b)(ii)</p> 	Correct shape of two rectangle and a trapezium	K1
		$KQ = TU = UV = 3$ cm	K1
		$LK > QV > KQ / TU / UV$	K1
		Correct measurement ± 0.2 cm	N2
			12

No	Marking Scheme	Marks																																														
15	<p>(a)</p> <table border="1" data-bbox="506 296 1232 737"> <thead> <tr> <th></th> <th>Class Interval</th> <th>Frequency</th> <th>Upper Boundary</th> <th>Cumulative Frequency</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>11 – 15</td> <td>0</td> <td>15.5</td> <td>0</td> </tr> <tr> <td>II</td> <td>16 – 20</td> <td>1</td> <td>20.5</td> <td>1</td> </tr> <tr> <td>III</td> <td>21 – 25</td> <td>3</td> <td>25.5</td> <td>4</td> </tr> <tr> <td>IV</td> <td>26 – 30</td> <td>6</td> <td>30.5</td> <td>10</td> </tr> <tr> <td>V</td> <td>31 – 35</td> <td>10</td> <td>35.5</td> <td>20</td> </tr> <tr> <td>VI</td> <td>36 – 40</td> <td>11</td> <td>40.5</td> <td>31</td> </tr> <tr> <td>VII</td> <td>41 – 45</td> <td>7</td> <td>45.5</td> <td>38</td> </tr> <tr> <td>VIII</td> <td>46 – 50</td> <td>2</td> <td>50.5</td> <td>40</td> </tr> </tbody> </table> <p>Frequency : (I to VIII) correct Upper boundary : (I to VIII) correct Cumulative Frequency : (I to VIII) correct</p> <p>(b)</p> $\frac{(18 \times 1) + (23 \times 3) + (28 \times 6) + (33 \times 10) + (38 \times 11) + (43 \times 7) + (48 \times 2)}{40}$ <p>or $\frac{1400}{40}$</p> <p>35</p> <p>(c) <u>Ogive</u> (<i>Refer graph</i>)</p> <p>Axes drawn in the correct direction , uniform scale for $15.5 \leq x \leq 50.5$ and $0 \leq y \leq 40$.</p> <p>Horizontal axis labeled using upper boundary or use the values of upper boundary for plotting</p> <p>8 points plotted correctly <u>or</u> the ogive passed through them.</p> <p>The ogive completed and passed through 8 points correctly.</p> <p>(d) 40 – 30.5 9.5</p>		Class Interval	Frequency	Upper Boundary	Cumulative Frequency	I	11 – 15	0	15.5	0	II	16 – 20	1	20.5	1	III	21 – 25	3	25.5	4	IV	26 – 30	6	30.5	10	V	31 – 35	10	35.5	20	VI	36 – 40	11	40.5	31	VII	41 – 45	7	45.5	38	VIII	46 – 50	2	50.5	40	<p>P1 P1 P1</p> <p>K2</p> <p>N1</p> <p>K1</p> <p>K1</p> <p>K1</p> <p>N1</p> <p>K1 N1</p>	<p>12</p>
	Class Interval	Frequency	Upper Boundary	Cumulative Frequency																																												
I	11 – 15	0	15.5	0																																												
II	16 – 20	1	20.5	1																																												
III	21 – 25	3	25.5	4																																												
IV	26 – 30	6	30.5	10																																												
V	31 – 35	10	35.5	20																																												
VI	36 – 40	11	40.5	31																																												
VII	41 – 45	7	45.5	38																																												
VIII	46 – 50	2	50.5	40																																												

No	Marking Scheme	Marks	
16	<p>(a) (i) $62^\circ E$</p> <p>(ii) $Q (40^\circ N , 122^\circ E)$</p> <p>(b) 100×60 6000</p> <p>(c) $\cos 40$ seen $120 \times 60 \times \cos 40$ 5515.52</p> <p>(d) $\frac{5515.52 + 3780}{680}$ or $\frac{9295.52}{680}$ 13.67 hours</p>	<p>P1 P1</p> <p>P1 P1</p> <p>K1</p> <p>N1</p> <p>K1</p> <p>K1</p> <p>N1</p> <p>K1 K1</p> <p>N1</p>	<p>12</p>

Graph for Question 12



Graph for Question no 15

