SULIT
1449/1
Matematik
Kertas 1
September
2008
$1\frac{1}{4}$ jam

SEKOLAH-SEKOLAH MENENGAH NEGERI PAHANG
PEPERIKSAAN PERCUBAAN SPM 2008

MATEMATIK

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa*.

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

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

MATHEMATICAL FORMULAE
RUMUS MATEMATIK

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.
Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

RELATIONS
PERKAITAN

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

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

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

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

5 Distance / *Jarak*

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

6 Midpoint / *Titik tengah*

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

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

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

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

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

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

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

10 Pythagoras Theorem
Teorem Pithagoras

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

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

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

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

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

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

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 $= \pi d = 2 \pi r$
Lilitan bulatan $= \pi d = 2 \pi j$

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

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

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

6 Volume of right prism = cross sectional area $\times$ length
Isipadu prisma tegak = luas keratan rentas $\times$ *panjang*

7 Volume of cylinder $= \pi r^2 h$
Isipadu silinder $= \pi j^2 t$

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

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

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

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

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

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

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

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

$\dfrac{\textit{panjang lengkuk}}{\textit{lilitan bulatan}} = \dfrac{\textit{sudut pusat}}{360^o}$

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

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

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

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

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

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

1. Round off 0.03718 correct to three significant figures.
Bundarkan 0.03718 betul kepada tiga angka bererti.

   A. 0.03

   B. 0.04

   C. 0.037

   D. 0.0372

2. Express 53900 in standard form.
Ungkapkan 53900 dalam bentuk piawai.

   A. 5.39×10^{4}

   B. 5.39×10^{-4}

   C. 539×10^{2}

   D. 539×10^{-2}

3. $5.8 \times 10^{-7} - 7 \times 10^{-8} =$

   A. 5.1×10^{-7}

   B. 5.1×10^{-6}

   C 6.9×10^{-7}

   D. 6.9×10^{-6}

4. A factory produces 7.8×10^{3} and 4.5×10^{3} toys in March and April respectively. The total number of toys produced in the two months is
Sebuah kilang menghasilkan 7.8×10^{3} and 4.5×10^{3} permainan dalam bulan March dan April masing-masing. Jumlah permainan yang dihasilkan dalam dua bulan itu adalah

   A. 12.3×10^{6}

   B. 1.23×10^{5}

   C. 1.23×10^{4}

   D. 1.23×10^{3}

5. Express $2(8^4) + 8^2 + 5$ as a number in base eight.
Ungkapkan $2(8^4) + 8^2 + 5$ sebagai nombor dalam asas lapan.

A. 2085_8

B. 1015_8

C. 50102_8

D. 20105_8

6. $11100_2 + 1101_2$

A. 101001_2

B. 110110_2

C. 111101_2

D. 101101_2

7. In Diagram 1, P,Q,R,S and U are five of the vertices of a regular polygon. The value of x is
Dalam Rajah 1, P,Q,R,S dan U ialah lima daripada bucu-bucu sebuah polygon sekata. Nilai x ialah

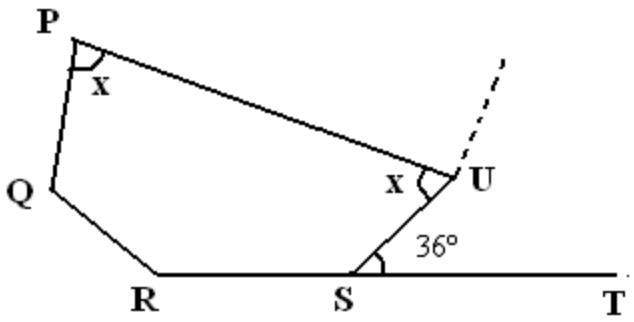


Diagram / Rajah 1

A. 27

B. 36

C. 54

D. 60

8. In Diagram 2, PR is a tangent to a circle QST at Q. The value of x is
Dalam Rajah 2, PR ialah tangen kepada bulatan QST di Q. Nilai x ialah

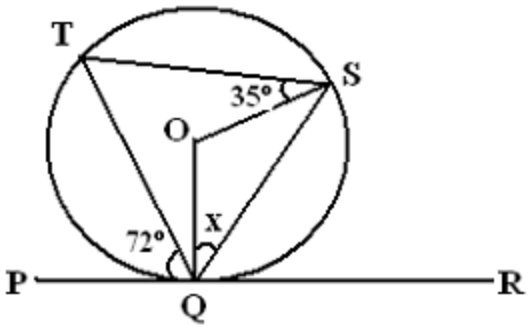


Diagram /Rajah 2

A. 35°

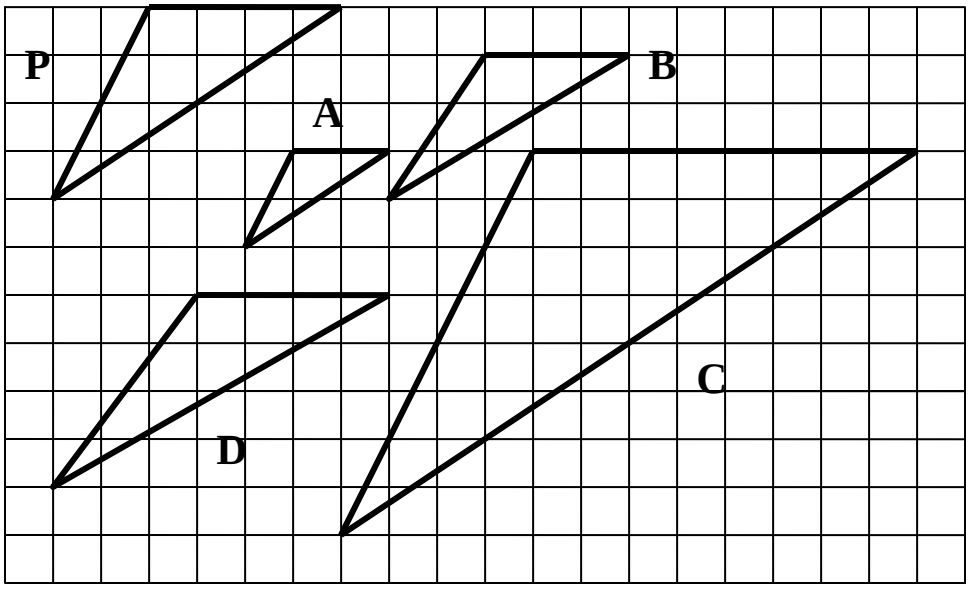
B. 37°

C. 39°

D. 41°

9. Diagram 3 shows five triangles drawn on square grids. Which of the triangle A,B,C,D is the image of triangle P under an enlargement with scale factor $\frac{1}{2}$.

Rajah 3 menunjukkan lima buah segi tiga yang dilukis pada grid segi empat sama. Antara segitiga A,B,C dan D , yang manakah imej bagi segitiga P di bawah suatu pembesaran dengan factor skala $\frac{1}{2}$



Diagram/ Rajah 3

10. In Diagram 4, which of the point, A, B, C or D is the image of *P* under a reflection in the x-axis followed by a translation $\begin{pmatrix} -2 \\ -2 \end{pmatrix}$?

Dalam Rajah 4, titik manakah diantara A,B ,C atau D ialah imej bagi P dibawah pantulan pada paksi x diikuti dengan translasi $\begin{pmatrix} -2 \\ -2 \end{pmatrix}$*?*

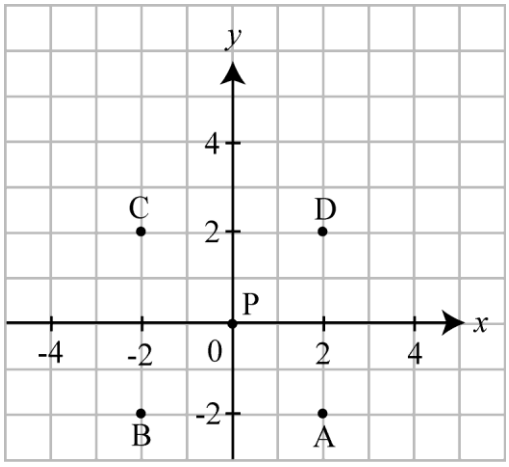
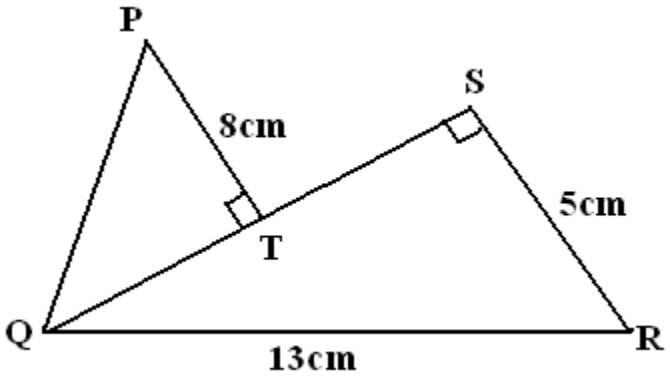


Diagram /Rajah4

11. In Diagram 5, QTS is a straight line and tan $\angle PQT = 2$. Find the length of TS.
Dalam Rajah 5, QTS ialah satu garis lurus. Cari panjang TS.



Diagram/Rajah 5

` A. 5

B. 6

C. 8

D. 9

12. Given that tan x^o = - 0.7002 and $180^o \leq x \leq 360^o$. Find the value of sin x.
Diberi bahawa tan x^o = - 0.7002 dan $180^o \leq x \leq 360^o$. *Cari nilai bagi sin x.*

A. -0.4266

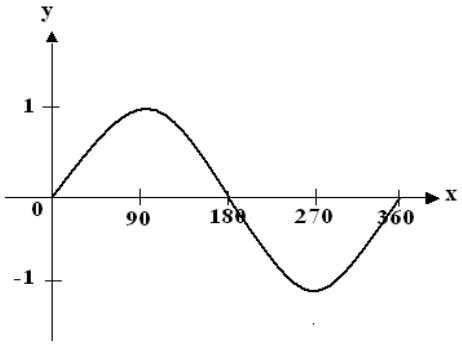
B. -0.4766

C. -0.5647

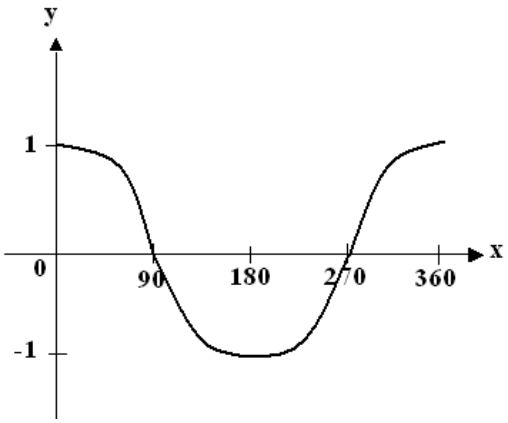
D. -0.5736

13. Which of the following graphs represents y = cos x

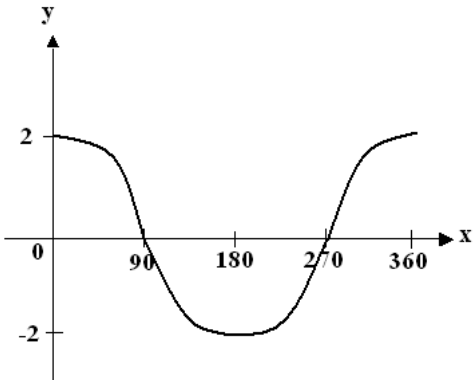
A.



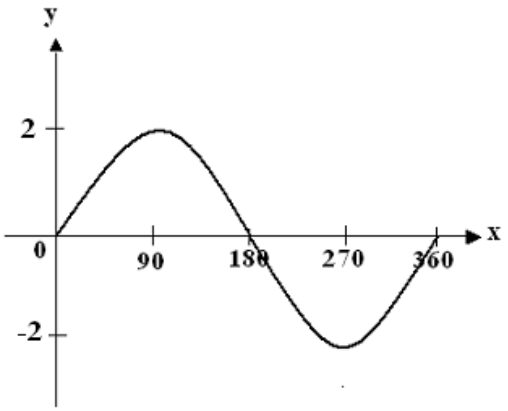
B.



C.

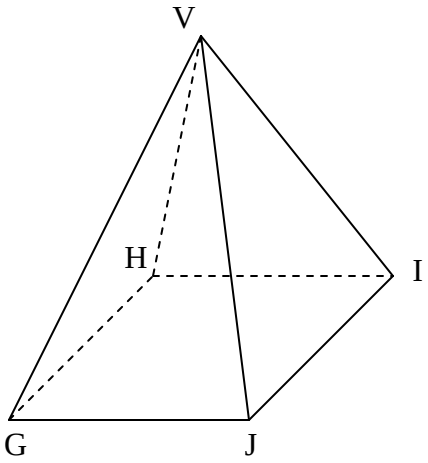


D.



14. Diagram 6 shows a pyramid with a horizontal rectangular base GHIJ. Name the angle between line VI and plane HIJG.

Rajah 6 menunjukkan sebuah piramid dengan tapak segiempat ghij. Namakan sudut antara garis VI dengan satah HIJG.



Diagram/Rajah 6

A. $\angle VIJ$

B. $\angle VIG$

C. $\angle VIH$

D. $\angle VHI$

15. In Diagram 7, GK and HJ are two vertical poles standing on a horizontal ground. The angle of depression of J from K is 15^0 . Calculate the height of pole HJ in m.

Dalam Rajah 7, GK dan HJ adalah dua batang tiang tegak yang terletak pada satah mengufuk. Sudut tunduk puncak J dari K ialah 15^0. Hitungkan tinggi tiang tegak HJ dalam m.

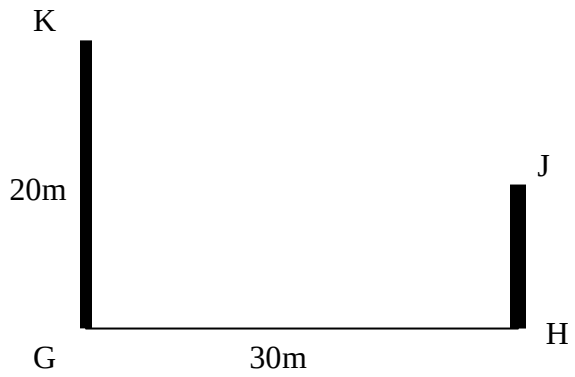


Diagram / Rajah 7

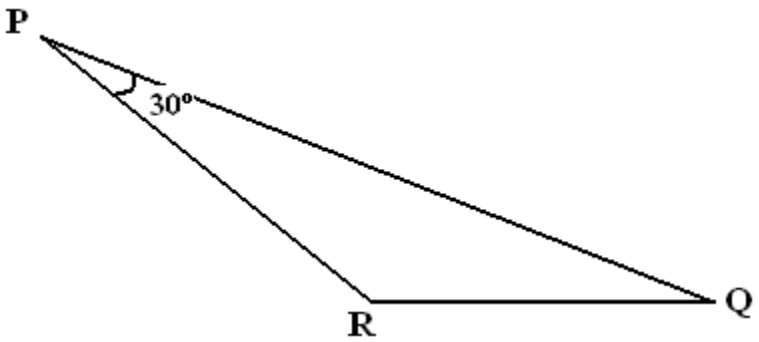
A. 9

B. 10

C. 12

D. 14

16. Diagram 8 shows three points, P,Q and R, on a horizontal plane. It is given that Q lies due east of R and the bearing of Q from P is 115^0 . Find the bearing of P from R.
Rajah 8 menunjukkan tiga titik, P,Q dan R yang terletak pada satah mengufuk. Diberi Q terletak ke timur R dan bering Q dari P ialah 115^0. Cari bering P dari R.



Diagram/Rajah 8

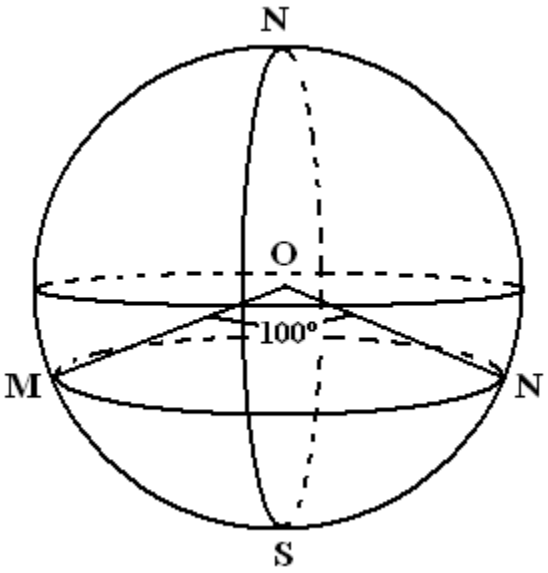
A. 235^0

B. 295^0

C. 325^0

D. 340^0

17.



Diagram/Rajah 9

In Diagram 9, *N* is a North Pole and S is South Pole and *NOS* is the axis of earth. Given that ∠MON = 100º. State the latitude of MN
Dalam Rajah 9, N adalah kutub utara manakala S adalah kutub selatan dan NOS adalah paksi bumi.Diberi bahawa ∠MON = 100º. Nyatakan latitud MN.

A. 40 ºS

B. 40º N

C. 50º S

D. 50º N

18. P (54^0 S , 68^0 W) and Q are two points on the surface of the earth . Given that PQ is the diameter of the earth. Find the longitude of Q
P (54^0 S , 68^0 W) dan Q adalah dua titik di permukaan bumi dengan keadaan PQ adalah diameter bumi. Cari Longitud bagi Q.

A. 108^0 E

B. 102^0E

C. 106^0 E

D. 112^0 E

19. Express $\frac{y+4}{2x} - \frac{2y-1}{xy}$ as a single fraction in its simplest form.
Nyatakan $\frac{y+4}{2x} - \frac{2y-1}{xy}$ *sebagai satu pecahan tunggal dalam bentuk termudah*

A. $\frac{y^2+1}{2xy}$

B. $\frac{y^2+2}{2xy}$

C. $\frac{y^2-2}{2xy}$

D. $\frac{2y+2}{xy}$

20. $p(p-4q) - (p-2q)^2 =$

A. $-4q^2$

B. $-4p^2$

C. $4pq - 4p^2$

D. $4pq - 4q^2$

21. Given that $\frac{m-2n}{n}=2m$, express m in term of n.

Diberi bahawa $\frac{m-2n}{n}=2m$, *ungkapkan m dalam sebutan n..*

A. $1-2n^2$

B. $\frac{2n}{1-2n}$

C. $\frac{4n}{1-n}$

D. $\frac{4n}{1-2n}$

22. Given that 2(3k – 5) = 6 – (2 +k). The value of k is
Diberi bahawa 2(3k – 5) = 6 – (2 +k) *. Nilai k ialah*

A. -2

B. 2

C. -7

D. 7

23. The value of $81^{\frac{3}{4}}$ is

Nilai bagi $81^{\frac{3}{4}}$ *ialah*

A. 3

B. 9

C. 12

D. 27

24. Simplify ($k^{\frac{1}{2}}m^{\frac{1}{3}})^2 \times k^2 m^{\frac{1}{3}}$

Ringkaskan ($k^{\frac{1}{2}}m^{\frac{1}{3}})^2 \times k^2 m^{\frac{1}{3}}$

A. km

B. k^2m

C. k^3m

D. k^2m^2

25. List all the integers of p that satisfies the two inequalities
$2p - 1 \leq 9$ and $11-3p < 2$.
Senaraikan semua nilai integer p yang memuaskan kedua-dua ketaksamaan
$2p - 1 \leq 9$ and $11-3p < 2$.

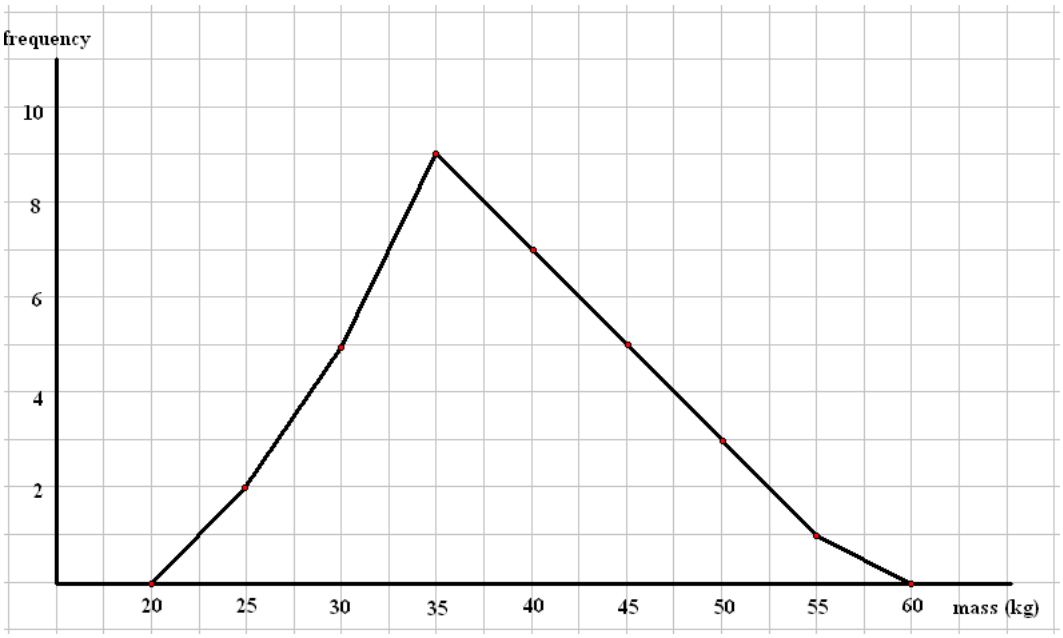
A. 4,5

B. 3,4,5

C. 4,5,6

D. 3,4,5,6

26. Diagram 10 is a frequency polygon that represents the masses of 32 boxes. Calculate the mean mass of the box in kg
Rajah 10 adalah sebuah polygon frekuensi yang mewakili berat 32 kotak. Hitungkan berat purata bagi kotak itu dalam kg.



Diagram/Rajah 10

A. 38.28

B. 31.15

C. 32.03

D. 46.43

27. The numbers 2,3,5,k,10,15 are arranged in ascending order. Given the median and mean are the same, find the value of k.
Nombor 2,3,5,k,10,15 telah disusun secara menaik. Diberi median dan purata adalah sama . Cari nilai bagi k.

A. 6

B. 7

C. 8

D. 10

28. Diagram 11 shows a graph for function $y = 3x^n$. State the value of x.

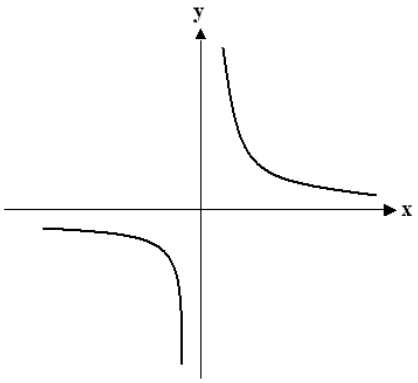


Diagram /Rajah 11

A. -2

B. -1

C. 1

D. 3

29.

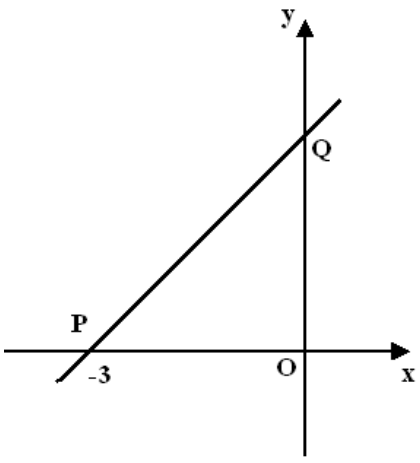


Diagram / Rajah 12

In the Diagram 12, OP=OQ. The equation of PQ is
Dalam rajah, OP = OQ. Persamaan bagi PQ ialah

A. $y = -x - 3$

B. $y = -x + 3$

C. $y = x - 3$

D. $y = x + 3$

30. Which of the following lines has a y-intercept equal to the y-intercept of the line $2y = 3x + 4$
Manakah diantara garis lurus berikut mempunyai pintasan-y yang sama dengan pintasan-y bagi garis lurus $2y = 3x + 4$.

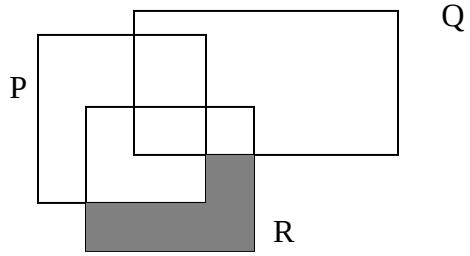
A. $y = x + 4$

B. $y + 6x = 2$

C. $y - 3x = 4$

D. $2y = 3x + 1$

31.



Which of the following sets represents the shaded region in the Venn diagram shown?
Manakah set yang diwakili oleh kawasan berlorek dalam gambajah Venn yang ditunjukkan.

A. $(P \cap R \cup Q)$

B. $P' \cap R \cap Q$

C. $(P \cup Q) \cap R$

D. $(P \cup Q)' \cap R$

32. Given universal set $\xi = \{x : 1 \leq x \leq 12, \text{x is an integer}\}$,
set H = {x: x is a prime number} and set K = { x ; x is a multiple of 6 }.
Find n (H $\cup K$)'
Diberi set universal $\xi = \{x : 1 \leq x \leq 12, x \text{ adalah integer}\}$,
set H = {x: x adalah nombor perdana} dan set K = { x ; x gandaan bagi 6}.
Cari n (H $\cup K$ *)'*

A. 2

B. 5

C. 6

D. 7

33. Given that universal set ξ = {x: $1 \leq x \leq 10$, x is an integer}
Set A = {x: x is a prime number}and B = {x: x is a multiple of 2}
Find $n(A \cap B')$
Diberi set Semesta ξ *= { x : 1* $\leq x \leq 10$, *x is an integer }.*
A = {x: x ialah nombor perdana} dan B = {x : x ialah nombor gandaan 2}
Cari $n(A \cap B')$

A. 1

B. 2

C. 3

D. 4

34. A bag contains 320 red, blue and yellow marbles. 100 of the marbles are red. If a marble is randomly selected from the bag, the probability that the marble is yellow is $\frac{1}{4}$. Calculate the number of green marbles in the bag.

Sebuah bag mengandungi 320 biji guli berwarna merah, biru dan kuning.100 dari guli itu berwarna merah. Jika sebiji guli diambil secara rawak daripada beg itu, kebarangkalian sebiji guli kuning dipilih ialah $\frac{1}{4}$. *Kirakan bilangan guli hijau yang terdapat dalam kotak itu.*

A. 30

B. 80

C. 120

D. 140

35. Table 1 shows a number of students participating in a Recycle Campaign from two society. A student is chosen at random from the group.

Jadual 1 menunjukkan bilangan pelajar dari dua buah persatuan yang menyertai Kempen Kitar Semula. Jika seorang pelajar dipilih dari kumpulan pelajar ini,

Group	Mathematics Society	Science Society
Boy	22	18
Girl	36	24

Table /Jadual1

Find the probability that a girl from Science Society will be choosen.

Cari kebarangkalian seorang pelajar perempuan dari Persatuan Sains dipilih.

A. $\frac{3}{7}$

B. $\frac{3}{5}$

C. $\frac{2}{25}$

D. $\frac{6}{25}$

36. Given that $m \propto \sqrt{p}$, and m = 10 and p = 4 . Find the value of p if m = 35.
Diberi $m \propto \sqrt{p}$ *dan m = 10 apabila p = 4. Cari nilai p jika m = 35*

A. 7

B. 9

C. 49

D. 81

37. Given $y \propto x^m z^n$. If y varies inversely with square root of x and directly with z, the value of m and n are
Diberi $y \propto x^m z^n$. *Jika y berubah secara songsang dengan punca kuasa dua x dan secara langsung dengan z, nilai bagi m dan n ialah*

A. $m = \frac{1}{2}$, n = 1

B. $m = \frac{1}{2}$, n = -1

C. $m = -\frac{1}{2}$, n = 1

D. $m = -\frac{1}{2}$, n = -1

38. Given that P varies directly as the square of e and inversely as square root of f. P = 9 when e = 3 and f = 25. Express P in terms of e and f.
Diberi bahawa P berubah secara langsung dengan kuasa dua e dan secara songsang dengan punca kuasa dua f. P = 9 apabila e =3 dan f =2. Ungkapkan P dalam sebutan e dan f .

A. $P = 5e^2\sqrt{f}$

B. $P = \dfrac{5e^2}{\sqrt{f}}$

C. $P = \dfrac{\sqrt{f}}{5e^2}$

D. $P = \dfrac{15e^2}{\sqrt{f}}$

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

A. $\begin{pmatrix} -2 \\ 6 \end{pmatrix}$

B. $\begin{pmatrix} 2 \\ 14 \end{pmatrix}$

C. $\begin{pmatrix} -6 & -4 \\ -10 & 16 \end{pmatrix}$

D. $\begin{pmatrix} -6 & -2 \\ 20 & 16 \end{pmatrix}$

40. Given that $k\begin{pmatrix}1\\-3\end{pmatrix}+\begin{pmatrix}4\\2\end{pmatrix}=\begin{pmatrix}3k\\-4\end{pmatrix}$, then the value of k is

Diberi bahawa $k\begin{pmatrix}1\\-3\end{pmatrix}+\begin{pmatrix}4\\2\end{pmatrix}=\begin{pmatrix}3k\\-4\end{pmatrix}$, *nilai k ialah*

A. -2

B. -1

C. 1

D 2

END OF QUESTION PAPER

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consist of 40 questions.
Kertas soalan ini mengandungi 40 soalan.

2. Answer all questions.
Jawab semua soalan.

3. Each question is followed by four alternative answers, **A, B, C** and **D**. For each question ,shoose one answer only. Blacken your answer on the objective answer sheet provided.
*Tiap-tiap soalan diikuti dengan 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. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the new answer.
Jika anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru

5. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

6. A list of formulae is provided on pages 2 to 3.
Satu senarai rumus disediakan di halaman 2 hingga 3.

7. A booklet of four- figure mathematical tables is provided.
Sebuah buku sifir matematik empat angka disediakan.

8. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

1449/2
Matematik
Kertas 2
Mei 2008
2½ jam

SEKOLAH-SEKOLAH MENENGAH NEGERI PAHANG

PEPERIKSAAN PERCUBAAN SPM 2008

MATEMATIK
Kertas 2
Dua Jam Tiga Puluh Minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1 *Tulis* **nombor kad pengenalan** *dan* **angka giliran** *anda pada ruangan yang disediakan .*

2 *Kertas soalan ini adalah dalam dwibahasa .*

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

4 *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.*

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

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

Kertas soalan ini mengandungi 30 halaman bercetak

MATHEMATICAL FORMULAE
RUMUS MATEMATIK

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.
Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

RELATIONS
PERKAITAN

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

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

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

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

5 Distance / *Jarak*

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

6 Midpoint / *Titik tengah*

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

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

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

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

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

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

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

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

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

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

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

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

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

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 $= \pi d = 2 \pi r$
Lilitan bulatan $= \pi d = 2 \pi j$

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

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

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

6 Volume of right prism = cross sectional area $\times$ length
Isipadu prisma tegak = luas keratan rentas $\times$ *panjang*

7 Volume of cylinder $= \pi r^2 h$
Isipadu silinder $= \pi j^2 t$

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

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

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

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

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

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

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

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

$$\frac{\textit{panjang lengkuk}}{\textit{lilitan bulatan}} = \frac{\textit{sudut pusat}}{360^o}$$

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

$$\frac{\textit{luas sektor}}{\textit{luas bulatan}} = \frac{\textit{sudut pusat}}{360^o}$$

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

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

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

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

SECTION A
Bahagian A
[52 marks]
[52 markah]

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

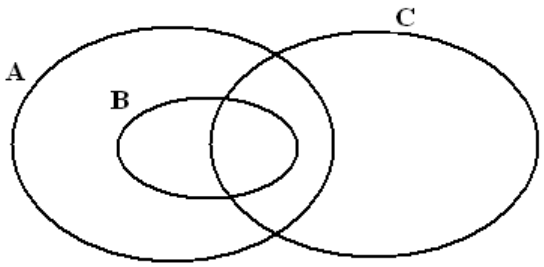
1 On the diagrams provided in the answer space, shade the region which represent the following operation of set.
Pada ruang jawapan dalam rajah yang disediakan, lorekkan rantau yang mewakili operasi-operasi set berikut.

(a) Set $A \cap B'$
(b) (b) $A \cap (B \cup C)'$

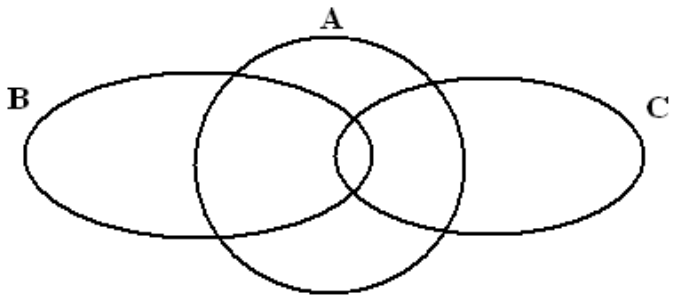
[3 marks]
[3 markah]

Answer / *Jawapan*:

(a)



(b)



For Examiner's Use

2. Diagram 1 shows a solid formed by joining a cone and a hemisphere. The radius of the cone is 7cm. The volume of the solid is 1155 cm^3.

Rajah 1 menunjukkan suatu pepejal cantuman terdiri dari kon yang berjejari 7 cm. Isipadu cantuman pepejal itu ialah 1155 cm^3.

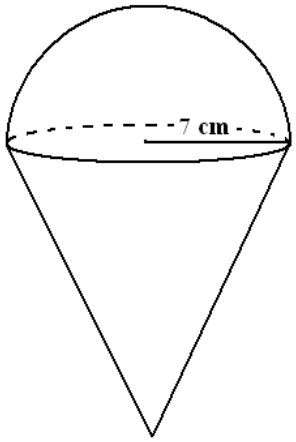


Diagram 1
Rajah 1

Calculate the height of the cone in cm.
Hitung tinggi kon dalam cm.

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

[4 marks]
[*4 markah*]

Answer / *Jawapan*:

3. Diagram 2 shows a right prism with a horizontal rectangular base CDEF. The triangle AFE is the uniform cross section of the prism.

Rajah 2 menunjukkan satu prisma tegak dengan segiempat CDEF sebagai tapak. Segitiga AFE adalah keratan rentas yang seragam pada prisma tersebut.

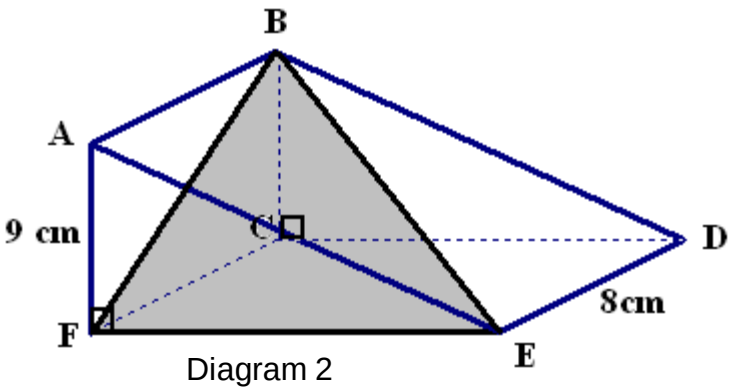


Diagram 2
Rajah 2

Calculate the angle between the plane BEF and the base CDEF.
Hitung sudut antara satah BEF dan CDEF.

[4 marks]
[*4 markah*]

Answer / *Jawapan*:

For Examiner's Use

4 (a) Determine whether the following statement is **true** or **false**.
*Nyatakan sama ada pernyataan berikut **benar** atau **palsu***

2 is an even number and 2 is a prime number.

2 adalah nombor genap dan 2 adalah nombor perdana.

(b) Write down two implications based on the following statement :
"$3^x = 1$ if and only if $x = 0$"

Tulis dua implikasi berdasarkan pernyataan berikut :
"3^x = jika dan hanya jika $x = 0$"

(c) Make a general conclusion by induction for the sequence of numbers 7, 20, 57,… which follows the following pattern.

Buat satu kesimpulan umum secara aruhan bagi turutan nombor 7, 20, 57,… yang mengikut pola berikut .

$7 = 2(3)^1 + 1$

$20 = 2(3)^2 + 2$

$57 = 2(3)^3 + 3$

… = ……..

[5 marks]
[5 markah]

Answer / *Jawapan* :

(a) ……

(b) Implication 1 / Implikasi 1 :

……

Implication 2 / Implikasi 2 :

……

(c) ……

……

5 Calculate the value of v and of w that satisfy the following simultaneous linear equations:

Hitung nilai v dan w yang memuaskan persamaan linear serentak berikut :

$$\frac{3}{2}v + w = 7$$
$$v - 6w = -2$$

[4 marks]
[4 markah]

Answer / *Jawapan* :

---

6. Using factorization, solve the following quadratic equation :

Menggunakan pemfaktoran, selesaikan persamaan kuadratik berikut:

$$2p = \frac{4p^2 - 15}{2}$$

[4 marks]
[4 markah]

Answer / *Jawapan*:

For Examiner's Use

7. In Diagram 3, KL, LM and MN are three straight lines. OK is parallel to LM and KL is parallel to MN. The equation of the straight line KL is 4x + 3y = 8.

Dalam Rajah 3, KL, LM dan MN adalah garis lurus. OK adalah selari dengan LM dan KL selari MN. Persamaan bagi garislurus KL adalah 4x + 3y = 8.

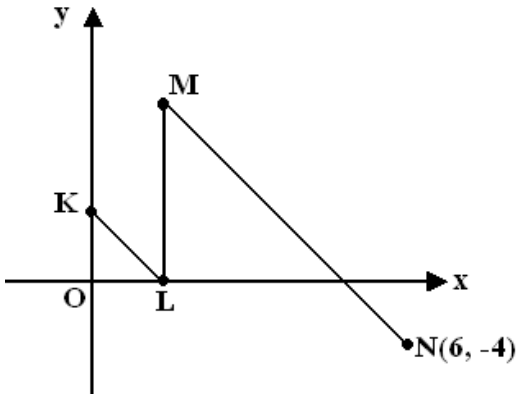


Diagram 3
Rajah 3

Find
Cari

(a) the equation of the straight line LM.
persamaan bagi garislurus LM.

(b) the equation of straight line MN and hence, state its y-intercept.
persamaan garislurus MN dan seterusnya nyatakan pintasan-y.

[5 marks]
[5 markah]

Answer / *Jawapan* :

(a)

(b)

For Examiner's Use

8. (a) It is given that matrix D = $\begin{pmatrix} 7 & -6 \\ 3 & -2 \end{pmatrix}$, matrix E = $\frac{1}{k}\begin{pmatrix} -2 & v \\ -3 & 7 \end{pmatrix}$ and DE = $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$.

Find the value of k and of v.

Diberi bahawa matriks D = $\begin{pmatrix} 7 & -6 \\ 3 & -2 \end{pmatrix}$, *matriks* E = $\frac{1}{k}\begin{pmatrix} -2 & v \\ -3 & 7 \end{pmatrix}$ *dan* DE = $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$.

Cari nilai k dan v.

(b) Using matrices, calculate the value of x and of y that satisfy the following matrix equation:

Menggunakan kaedah matriks, hitung nilai x dan nilai y yang memuaskan persamaan matriks berikut :

$$\begin{pmatrix} 7 & -6 \\ 3 & -2 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5 \\ 1 \end{pmatrix}$$

[6 marks]
[6 markah]

Answer/ *Jawapan* :

(a)

(b)

For Examiner's Use

9. Diagram 4 shows a sector OPQ of a circle with center O and a semicircle with diameter AOB. Given that OB = 7 cm and OP = 2OB.

Rajah 4 menunjukkan satu sector OPQ suatu bulatan berpusat di O dan satu semibulatan dengan diameter AOB. Diberi OB = 7 cm dan OP = 2OB.

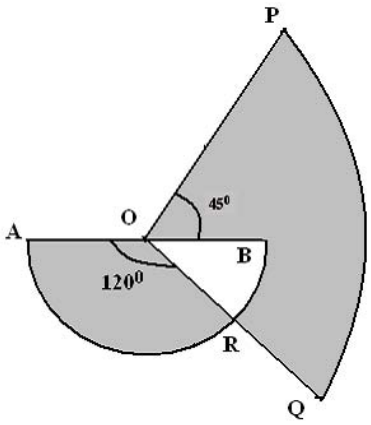


Diagram 4
Rajah 4

[Using/ *guna* $\pi = \frac{22}{7}$]

Calculate
Hitung

(a) the perimeter of the whole diagram,
perimeter 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 Use

10. The table below shows the number of boys and girls from a group of students who had passed or failed in a Mathematics test.

Jadual di bawah menunjukkan bilangan pelajar lelaki dan perempuan dari satu kumpulan pelajar yang lulus dan yang gagal dalam satu ujian Matematik.

	Pass / *Lulus*	Fail / *Gagal*
Boy / *Pelajar lelaki*	10	5
Girl / *Pelajar perempuan*	6	4

(a) If a student is picked at random from the group, find the probability of getting a student who had passed the Mathematics test.

Jika seorang pelajar dipilih secara rawak dari kumpulan, cari kebarangkalian untuk mendapatkan pelajar yang lulus ujian Matematik

(b) If two students are picked at random from the group, find the probability that

Jika dua pelajar dipilih secara rawak dari kumpulan, cari kebarangkalian bahawa

(i) two boys or two girls are picked
dua lelaki atau dua perempuan dipilih

(ii) both had passed the Mathematics test.
Kedua-dua adalah lulus ujian Matematik.

[5 marks]
[5 markah]

Answer / Jawapan :
(a)

(b) (i)

(ii)

For Examiner's Use

11. Diagram 5 shows the speed-time graph movement of a particle for a period of 26 seconds.

Rajah 5 menunjukkan graf laju-masa bagi pergerakan satu zarah dalam tempoh 26 saat.

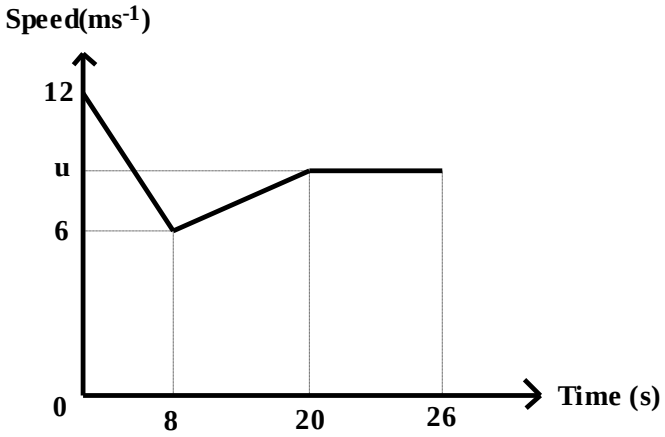


Diagram 5
Rajah 5

Calculate
Hitung

(a) State the period of time that the particle moves with uniform speed.
Nyatakan tempoh masa bagi zarah berada pada laju seragam.

(b) the rate of change in speed, in ms^{-2}, in the first 8 seconds.
kadar perubahan laju, dalam ms^{-2}, 8 saat yang pertama.

(c) The value of u, if the distance traveled in the last 18 seconds is 156m.
Nilai u, jika jarak pergerakan 18 saat terakhir adalah 156m.

[6 marks]
[6 markah]

Answer / *Jawapan* :

(a)

(b)

(c)

Section B
Bahagian B

[48 *marks*]
[48 *markah*]

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

12 (*a*) Complete Table 1 in the answer space for the equation $y = 3 - 4x - x^2$ by writing down the values of y when $x = -4$ and $x = 1$.
Lengkapkan Jadual 1 di ruang jawapan bagi persamaan dengan $y = 3 - 4x - x^2$ *menulis nilai-nilai* y *apabila* $x = -4$ *dan* $x = 1$.

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

(*b*) For this part of the question, use the graph paper provided on page 17.
You may use a flexible curve rule.
Untuk ceraian soalan ini, gunakan kertas graf yang disediakan pada halaman 17. Anda boleh menggunakan pembaris fleksibel.

By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 1 unit on the y-axis, draw the graph of $y = 3 - 4x - x^2$ for $-5 \le x \le 1$.
Dengan menggunakan skala 2cm *kepada* 1 *unit pada paksi-x dan* 2cm *kepada 1 unit pada paksi-y, lukis graf* $y = 3 - 4x - x^2$ *bagi* $-5 \le x \le 1$.

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

(*c*) From your graph, find
Daripada graf anda, cari
(i) the value of y when $x = -0.5$,
nilai y *apabila* $x = -0.5$,

(ii) the values of x when $y = 4$.
nilai x *apabila* $y = 4$.

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

(d) Draw a suitable straight line on your graph to find the values of x which satisfy the equation $x^2 + 3x - 3 = 0$ for $-5 \le x \le 1$.
State these values of x .
Lukiskan satu garis lurus yang sesuai pada graf anda untuk mencari nilai-nilai x *yang memuaskan persamaan* $x^2 + 3x - 3 = 0$ *bagi* $-5 \le x \le 1$.
Nyatakan nilai-nilai x *itu .*

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

For Examiner's Use

Answer / *Jawapan* :

(*a*)

x	-5	-4.5	-4	-3	-2	-1	0	0.5	1
y	-2	0.75		6	7	6	3	0.75	

Table 1
Jadual 1

(*b*) Refer graph on page 17.
Rujuk graf di halaman 17.

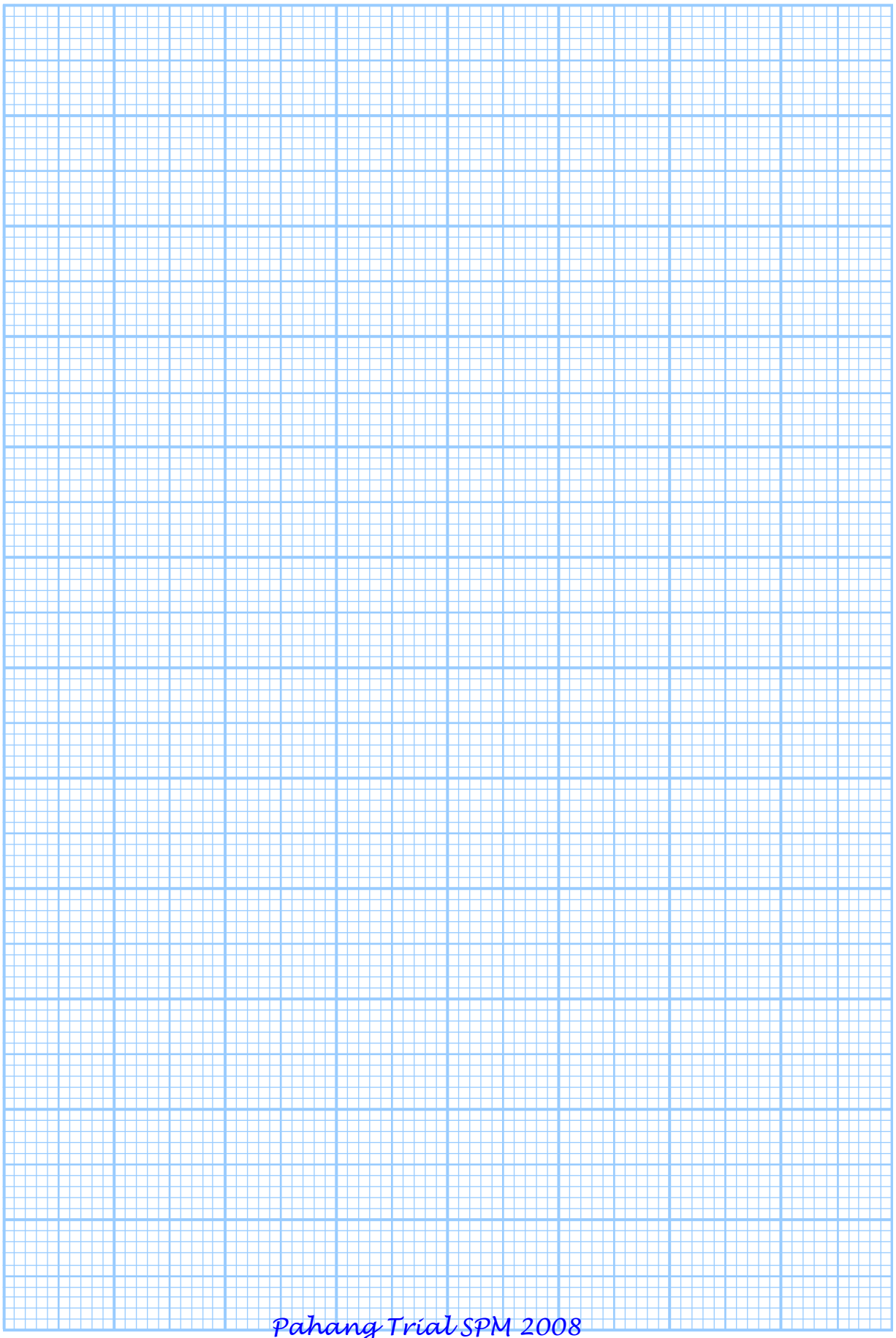
(*c*) (i) y = ...

(ii) x = ... , ...

(*d*) x = ...

For Examiner's Use

Graf for Question 12
Graf untuk Soalan 12



For Examiner's Use

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

(*a*) Diagram 6(i) shows a solid right prism with rectangular base JKLI on a horizontal plane. The surface *ABJIH* is the uniform cross-section of prism. *JB*, CK,*LG* and *HI* are vertical edges. Rectangle *ABCD* is a horizontal plane and rectangle ABHG is an inclined plane.

Rajah 6(i) *menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segiempat JKLI terletak di atas satah mengufuk. Permukaan ABJIH ialah keratan rentas seragamnya*. *Tepi JB,CK*,LG *dan HI adalah tegak*. *Segiempat tepat ABCD ialah satah mengufuk dan segiempat tepat ADGH ialah satah condong*.

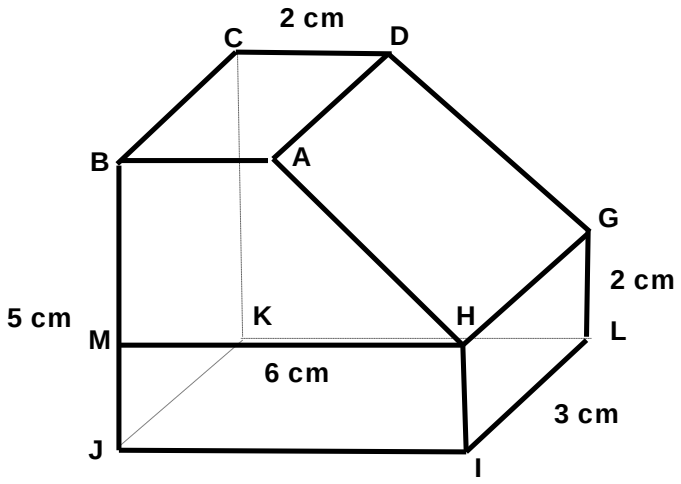


Diagram 6(i)
Rajah 6(i)

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

[3 marks]
[3 *markah*]

For Examiner's Use

Answer / *Jawapan* :

(*a*)

For Examiner's Use

(*b*) A solid in the shape of semi-cylinder is joined to the solid in Diagram 6(i) at the plane MHJI. The combined solid is shown in Diagram 6(ii). The base JPI lies on a horizontal plane. Given that the diameter of the semi-cylinder is 6cm.

Sebuah pepejal berbentuk separuh silinder dicantumkan kepada pepejal dalam Rajah 6(i) pada satah MHJI. Gabungan pepejal itu ditunjukkan dalam Rajah 6(ii). Tapak JPI berada pada satah mengufuk. Diberi diameter separuh silinder adalah 6 cm.

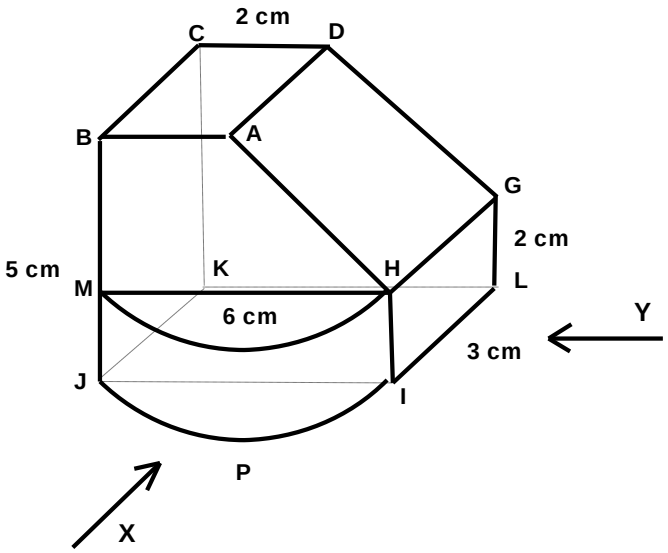


Diagram 6(ii)
Rajah 6(ii)

Draw full scale,
Lukiskan dengan skala penuh,

(i) the elevation of the remaining solid on a vertical plane parallel to as JI viewed from *X* .
dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan JI sebagaimana dilihat dari X .

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

(ii) the elevation of the remaining solid on a vertical plane parallel to *IL* as viewed from *Y* .
dongakan pepejal yang tinggal itu pada satah mencancang yang selari dengan IL sebagaimana dilihat dari Y .

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

For Examiner's Use

Answer / *Jawapan* :

(*b*) (i) , (ii)

For Examiner's Use

14 A(45° N, 60° W) , B (45°N, 20°W) and C are three points on the surface of the earth. AC is the diameter of the earth.
A(45° N, 60° E) , B (45°N, 20°W) and C adalah tiga titik pada permukaan bumi. AC ialah diameter bumi.

(*a*) State the longitude of *C*.
Nyatakan longitud bagi C.

[2 marks]
[2 *markah*]

(*b*) Find the distance in nautical mile from A to B measured along the common parallel of latitude.
Hitungkan jarak dalam batu nautika dari A ke B diukur sepanjang selarian latitude sepunya.

[3 marks]
[*3 markah*]

(c) Given that D lies at a distance of 4500 nautical miles due south of B. Find the position of D.
Diberi titik D terletak 4500 batu nautika ke selatan Q . Hitung latitud bagi D.

[3 marks]
[3 markah]

(d) An aeroplane leaves A and flies due north to C at a speed of 750 knots. Calculate the time taken to reach point C.
Sebuah kapal terbang bertolak dari A menuju ke C melalui kutub utara dengan purata laju 750 knot. Hitungkan masa yang diambil untuk sampai ke C.

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

Answer / *Jawapan* **:**

(*a*)

(*b*)

(*c*)

(d)

For Examiner's Use

15. Diagram 7 shows quadrilaterals ABCD, *EFGH* and *KLIJ* drawn on a Cartesian plane.
Rajah 7 menunjukkan sisisempat ABCD, EFGH dan KLIJ dilukis pada satah Cartesan.

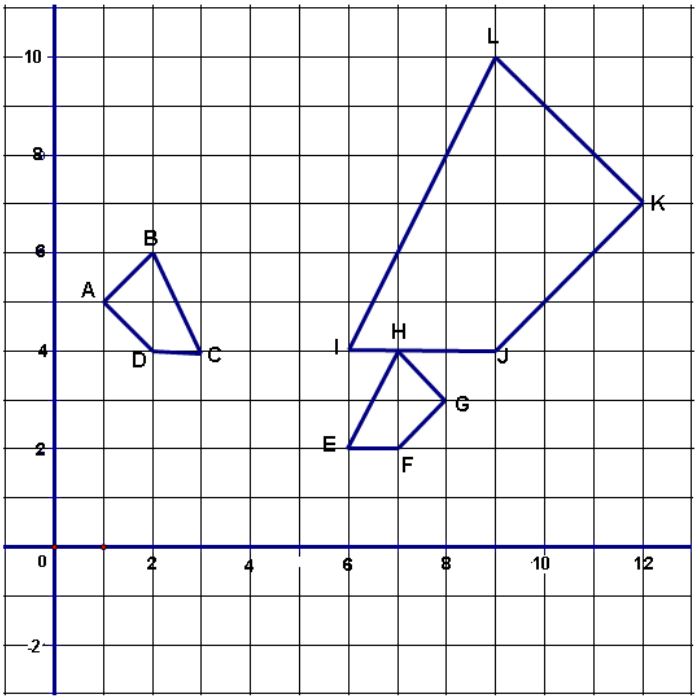


Diagram 7
Rajah 7

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

Transformation **P** is a reflection in the line $x = 3$.

Transformation **Q** is a reflection in the line y = 3

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

Penjelmaan **P** *ialah satu pantulan pada garis lurus* $x = 3$.

Penjelmaan ***Q*** *ialah satu pantulan pada garis lurus y = 3*

(i) State the coordinates of the image of point *E* under transformations T
Nyatakan koordinat imej titik E di bawah penjelmaan T.

[1 mark]
[1 markah]

(ii) State the coordinates of the image of point *A* under transformations P
Nyatakan koordinat imej titik A di bawah penjelmaan P.

[2 marks]
[2 markah]

(iii) State the coordinates of the image of point *H* under transformations QT
Nyatakan koordinat imej titik H di bawah penjelmaan QT.

[2 marks]
[*2 markah*]

(b) (i) By identifying the image of ABCD under the combined transformation QP, Describe in full a single transformation which is equivalent to the combined
transformation QP
Dengan mengenal pasti imej bagi ABCD di bawah penjelmaan QP, huraikan
satu penjelmaan tunggal yang setara dengan pejelmaan QP.

[3 marks]
[*3 markah*]

(ii) IJKL is the image of EFGH under transformation R. Describe in full transformation R.
IJKL ialah imej bagi EFGH dibawah satu penjelmaan R. Huraikan selengkapnya
penjelmaan R.

[3 marks]
[*3 markah*]

(c) If the area of EFGH is 15 unit^2, calculate the area of IJKL.
Jika luas EFGH ialah 15 unit ^{2}, hitungkan luas IJKL.

[2 marks]
[*2 markah*]

For Examiner's Use

Answer / *Jawapan*:

(a) (i)

(ii)

(iii)

(b) (i)

(ii)

(c)

16. Diagram 8 shows the telephone bills in RM , of a group of 40 teachers in a school for the month of Mei.
Jadual 8 menunjukkan bil telefon bagi bulan Mei *bagi sekumpulan* 40 *orang guru di sebuah sekolah.*

42	32	43	30	47	51	38	36
38	40	46	37	50	48	47	40
44	45	52	41	54	45	45	30
50	59	44	53	38	42	31	48
55	31	56	37	43	55	56	53

Diagram 8
Rajah 8

(*a*) Based on the data in Diagram 8, complete Table 2 in the answer space.
Berdasarkan data dalam Rajah 8, *lengkapkan Jadual* 2 *pada ruang jawapan*.

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

(*b*) Hence, calculate the estimated mean of the telephone bill.
Seterusnya, *hitung min anggaran bagi bil telefon mereka* .

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

(*c*) For this part of the question, use the graph paper provided on page 29.
Untuk ceraian soalan ini, *gunakan kertas graf yang disediakan di halaman* 29.
By using the scale of 2 cm to RM5 on the horizontal axis and 2 cm to 1 teachers on the vertical axis, draw a histogram for the data.
Dengan menggunakan skala 2 cm *kepada* RM5 *pada paksi mengufuk dan* 2 cm *kepada* 1 guru *pada paksi mencancang*, *lukis satu histogram bagi data tersebut*.

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

(*d*) Based on your histogram in 16(c), give one information about the modal class of the data.
Berdasarkan histogram anda di 16(c), *nyatakan satu maklumat berkaitan dengan kelas mod data tersebut*.

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

For Examiner's Use

Answer / *Jawapan* :

(*a*)

Bill (RM) ***Bil* (RM)**	**Frequency** ***Kekerapan***	**Midpoint** ***Titik tengah***
30 - 34		
35 - 39		

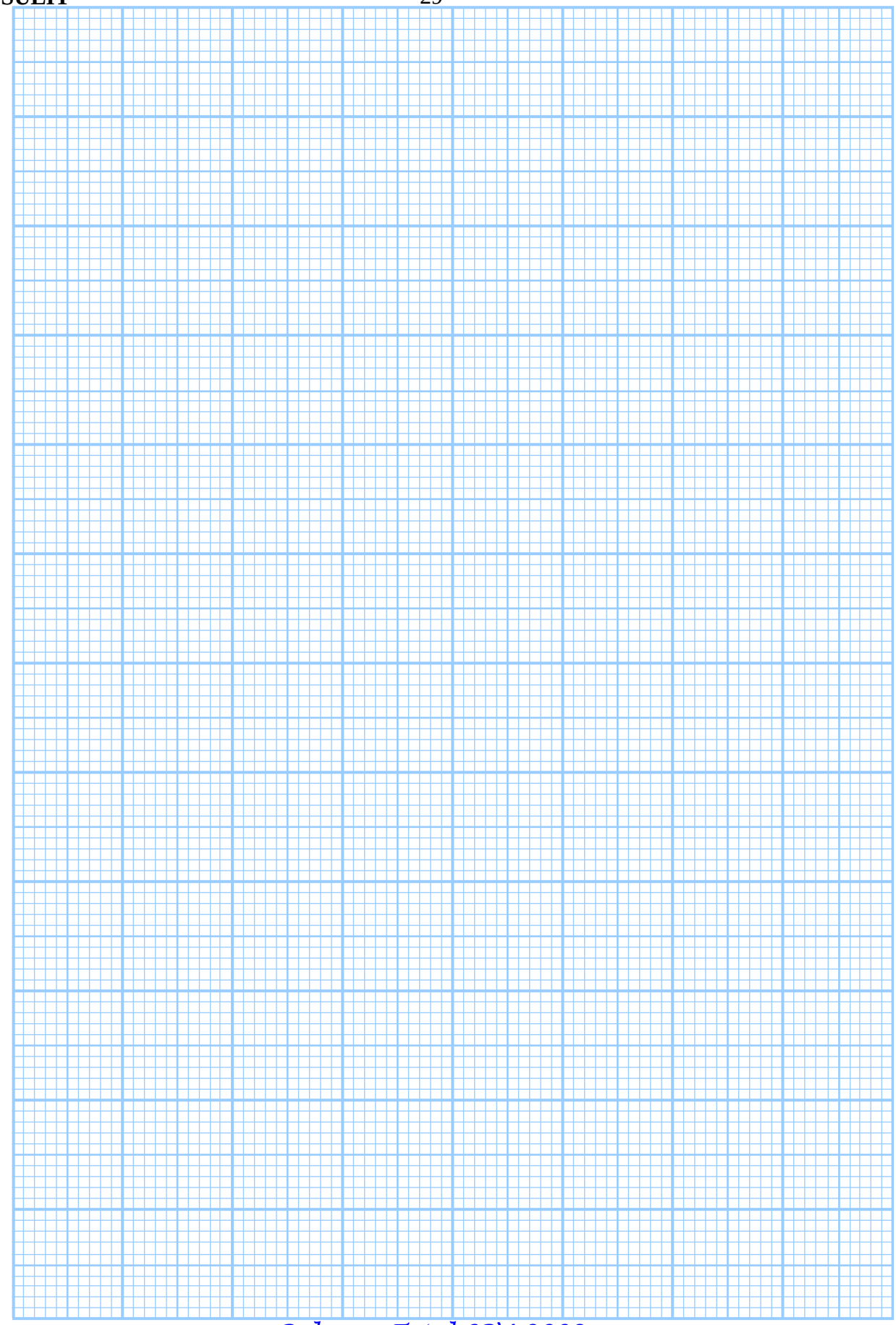
Table 2
Jadual 2

(*b*)

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

(*d*)

Graf for Question 16
Graf untuk Soalan 16



END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1 This question paper consists of two sections: **Section A** and **Section B**.
Kertas soalan ini mengandungi dua bahagian: ***Bahagian A*** *dan* ***Bahagian B***.

2 Answer **all** questions in **Section A** and **four** questions from **Section B**.
Jawab ***semua*** *soalan dalam* ***Bahagian A*** *dan* ***empa****t soalan daripada* ***Bahagian B***.

3 Write your answers in the space provided in the question paper.
Jawapan anda hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.

4 Show your working. It may help you to get marks.
Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah .

5 If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
Jika anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.

6 The diagrams in the questions provided are not drawn to scale unless stated .
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

7 The marks allocated for each question and sub-part of a question are shown in brackets.
Markah yang diperuntukkan bagi setiap soalan dan ceraian soalan ditunjukkan dalam kurungan.

8 A list of formulae is provided on page 2 to 4.
Satu senarai rumus disediakan di halaman 2 hingga 4.

9 A booklet of four-figure mathematical tables is provided .
Sebuah buku sifir matematik empat angka disediakan.

10 You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

11 Hand in this question paper to the invigilator at the end of the examination.
Serahkan kertas soalan ini kepada pengawas peperiksaan pada akhir peperiksaan.

PAPER 1 TRIAL 2008

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

1449/2
Matematik
Kertas 2
Mei 2008
2½ jam

SEKOLAH-SEKOLAH MENENGAH NEGERI PAHANG

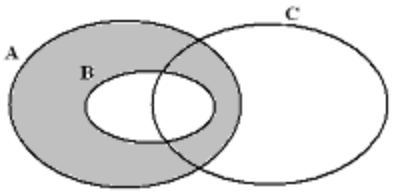
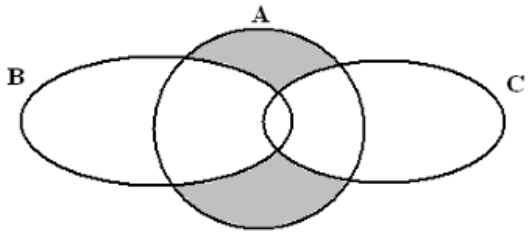
PEPERIKSAAN PERCUBAAN SPM 2008

MATEMATIK

Kertas 2

PERATURAN PERMARKAHAN

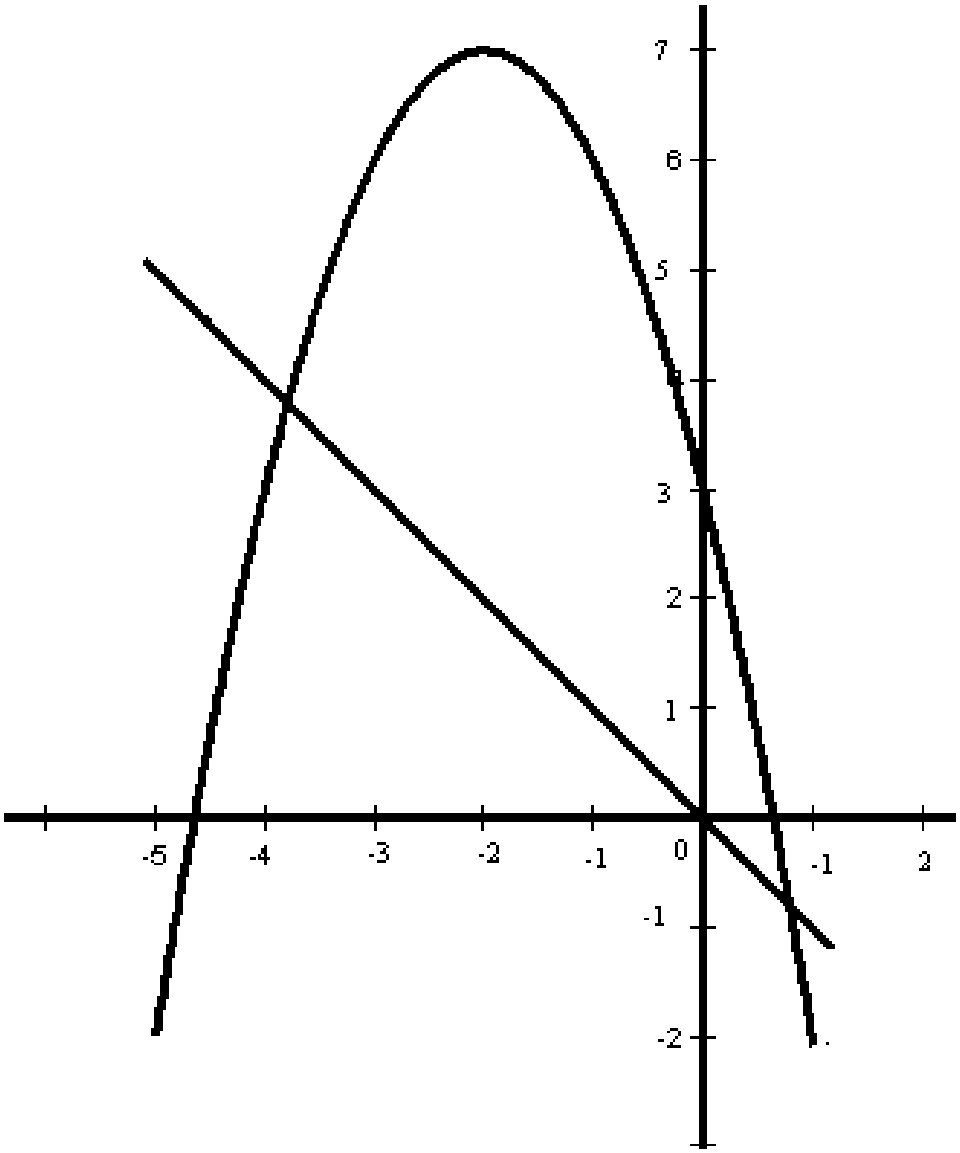
UNTUK KEGUNAAN PEMERIKSA SAHAJA

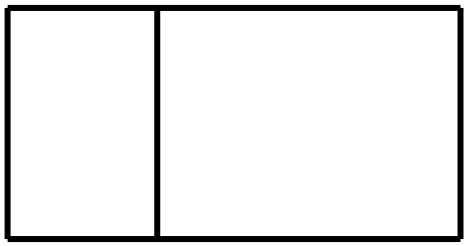
Question	Solution and Mark Scheme	Marks	
1(a)		K1	3
(b)		K2	
2	$\left(\frac{1}{2}\times\frac{4}{3}\times\frac{22}{7}\times 7^3\right)$ $1155 = \left(\frac{1}{3}\times\frac{22}{7}\times 7^2\times h\right)+\left(\frac{1}{2}\times\frac{4}{3}\times\frac{22}{7}\times 7^3\right)$ 154h = 1309 h = 8.5 cm	K1 K1 K1 N1	4
3.	Kenalpasti sudut $\angle$BFC or $\angle$CFB Tan $\angle$BFC = $\frac{9}{8}$ $\angle$BFC = 41.63^0 or $41^0\ 38'$	P1 K1K1 N1	4
4(a)	True	P1	5
(b)	If $3^x = 1$ then x = 0 If x = 0 then $3^x = 1$	K1 K1	
(c)	$2(3)^n + n$; n = 1, 2,3, …	K1K1	
5.	9v + 6w = 42 atau setara 10v = 40 atau setara v = 4 w = 1	K1 K1 N1 N1	4

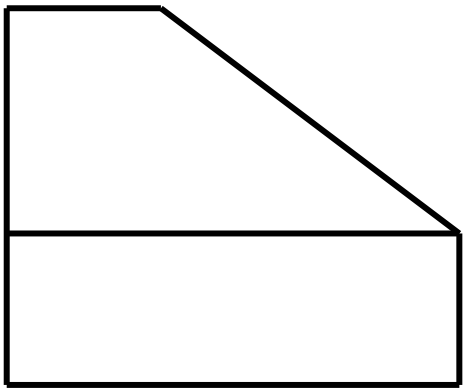
6	$4p^2 - 4p - 15 = 0$ $(2p+3)(2p-5) = 0$ $p = \frac{-3}{2}$ atau $p = \frac{5}{2}$	K1 K1 N1N1	4
7 (a)	$m_{kl} = -\frac{4}{3}$ LM; x=2	P1 N1	5
(b)	$-4 = -\frac{4}{3}(6) + c$ atau setara MN; $y = \frac{-4}{3}x + 4$ atau $3y = -4x + 12$ y-intercept is 12	K1 KI N1	
8 (a)	k = 4 v = 6	P1 P1	6
(b)	$\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{(7\times -2)-(-6\times 3)}\begin{pmatrix} -2 & 6 \\ -3 & 7 \end{pmatrix}\begin{pmatrix} 5 \\ 1 \end{pmatrix}$ x= -1 y = -2	K2 NI N1	
9 (a)	$\left[\frac{120}{360}\times 2\times\frac{22}{7}\times 7\right]$ atau $\left[\frac{105}{360}\times 2\times\frac{22}{7}\times 14\right]$ $7 + 7 + 14 + \frac{44}{3} + \frac{77}{3}$ $68\frac{1}{3}$ cm.	K1 K1 NI	6
(b)	$\left[\frac{120}{360}\times\frac{22}{7}\times 7^2\right]$ or $\left[\frac{60}{360}\times\frac{22}{7}\times 7^2\right]$ or $\left[\frac{105}{360}\times\frac{22}{7}\times 14^2\right]$ $\left(51\frac{1}{3}+179\frac{2}{3}-25\frac{2}{3}\right)$ $205\frac{1}{3}cm^2 atau \frac{616}{3}cm^2$	K1 K1 N1	

10(a) (b)(i) (ii)	$\frac{16}{25}$ $\left(\frac{15}{25}\times\frac{14}{24}\right)+\left(\frac{10}{25}\times\frac{9}{24}\right)$ $\frac{1}{2}$ $\left(\frac{16}{25}\times\frac{15}{24}\right)$ $\frac{2}{5}$	K1 K1 N1 K1 N1	5
11(a) (b) (c)	6s $\frac{6-12}{8-0}$ -0.75 $156\text{m} = \left[\frac{1}{2}(6+u)6\right] + 6\text{u}$ u = 10	P1 K1 N1 K1 N1	6

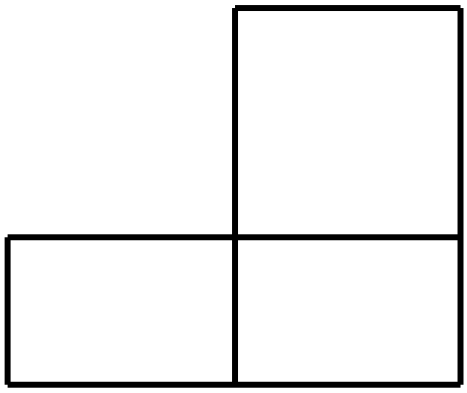
Question	Solution and Mark Scheme	Marks	
12(*a*)	3	K1	
	-2	K1	**2**
(*b*)	Graph		
	Axes drawn in correct direction, uniform scale for $-5 \le x \le 1$ and $-2 \le y \le 7$	P1	
	7 point and *2 points correctly plotted or curve passes through these points for $-5 \le x \le 1$.	K2	
	smooth and continuous curve without any straight line and passes through all 9 correct points using the given scale for $-5 \le x \le 3$.	N1	**4**
	Note: 7 or 8 points correctly plotted, award K1		
(*c*)(i)	$4.65 \le y \le 4.80$	P1	
(ii)	$-0.2 \le x \le -0.4$	P1	
	$-3.85 \le x \le -3.65$	P1	**3**
(*d*)	Identify equation y = - x	K1	
	Straight line y = - x correctly drawn	K1	
	Values of x :		
	$-3.85 \le x \le -3.7$ $0.7 \le x \le 0.9$	N1	**3**
	Note:		
	Values of y and x obtained by computations, award P0N0		**12**


7
6
5
3
2
1
-5
-4
-3
-2
-1
0
-1
2
-1
-2

Question	Solution and Mark Scheme	Marks	
13(*a*)	 Correct shape with rectangles KLPS and PQRS . All solid lines. *KL* > *DL* > *LI* Measurements correct to ± 0.2 cm (one way) and All angles at vertices of rectangles = $90^o \pm 1^o$	K1 K1 N1	**3**

Question	Solution and Mark Scheme	Marks	
(*b*)			
	Correct shape with rectangle *MJHI* and trapezium *ABMH* . All solid lines.	K1	
	$JB > JI = MH > BM > MJ = HI$	K2	
	Measurements correct to ± 0.2 cm (one way) and All angles at vertices of rectangles = $90^o \pm 1^o$	N2	**5**

Question	Solution and Mark Scheme	Marks

(*c*)			
	Correct shape with rectangles *HGIL* and *MHJI* and square *ADHG*. All solid lines.	K1	
	JL > *DL* = *AI* > *DG* = *HG* > *GL* = *HI*=*MJ*	K1	
	Measurements correct to ± 0.2 cm (one way) and All angles at vertices of rectangles = $90^{o} \pm 1^{o}$	K1	
		N2	**5**
			12

Question	Solution and Mark Scheme	Marks

14(*a*)	$120^{o}\ E$ Note: 120^{o} or $\theta\ E$, award P1	 P2	 **2**
(*b*)	$40 \times 60 \times \cos 45^{0}$ 1697.06 Notes: cos 45 used correctly, award K1	K2 N1	 **3**
(c)	$\frac{4500}{60}$ or 75^{0} 75 - 45 30^{0}S	K1 K1 N1	 **3**
(d)	10800 $750 = \frac{10800}{T}$ 14.4	 K1 K2 N1	 **4**
			12

Question	Solution and Mark Scheme	Marks

15(*a*)(i)	(8, -1) Note: point (8 , -1) marked on the diagram award P1	P1	
(ii)	(5 , 5) Note: point (5 , 5) marked on diagram, award P1	P2	
(iii)	(9, 5)	P2	**5**
(iv)	Rotation 180^o , centre *(3,3)* Note: 1. P2: Rotation 180^o, Rotation 180^o , centre *G* 2. P1: Rotation 180^o	P3	
(v)	Enlargement centre *N*(6,1) with scale factor 3 Note: 1. P2: Enlargement centre *N* *or* Enlargement scale factor 2 2. P1: Enlargement	P3	
(ii)	$\frac{160}{2^2}$ 40	K1 N1	**8**
			12

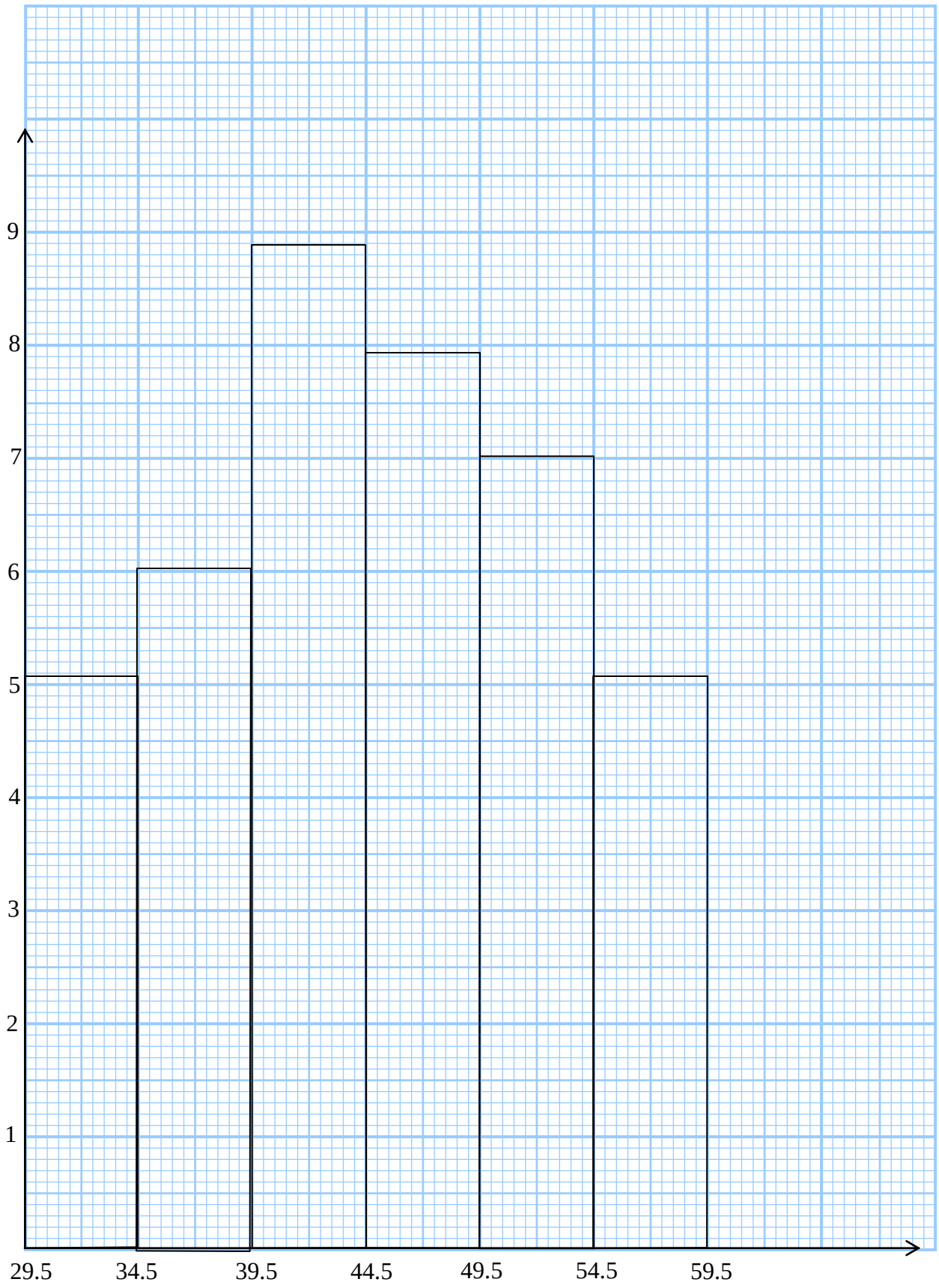
Question	Solution and Mark Scheme	Marks

16(*a*)			

Mass(kg)	Frequency	Midpoint	
30 - 34	5	32	I
35 - 39	6	37	II
40 - 44	9	42	III
45 - 49	8	47	IV
50 - 54	7	52	V
55 - 59	5	57	VI

	Class interval : (III to VI)	P1	
	Frequency : (I to VI)	P2	
	Midpoint : (I to VI)	P1	**4**
	Note: Allow one mistake in frequency for P1.		
(*b*)	$\dfrac{32(5)+37(6)+42(9)+47(8)+52(7)+57(5)}{5+6+9+8+7+5}$	K2	
	44.63	N1	
	Notes: Allow two mistakes for K1.		**3**
(*c*)	Axes drawn in correct direction, uniform scale for $29.5 \le x \le 59.5$ and $0 \le y \le 9$	P1	
	Using lower boundry *or* upper boundry *or* midpoint *or* class interval for *x*-axis.	K1	
	* 6 bar correctly drawn Note: * 5 bar correctly drawn, award N1	N2	**4**
(*d*)		K1	**1**
	example: Most of the telephone bill is between 40 to 44		**12**

Graph for Question 16
Graf untuk Soalan 16



END OF MARK SCHEME