1449/1
Mathematics
Paper 1
September 2010
1¼ jam

JABATAN PELAJARAN NEGERI JOHOR

PEPERIKSAAN PERCUBAAN SPM 2010

MATHEMATICS

Paper 1

One hour and fifthteen minutes

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Soalan di bahagian atas adalah dalam bahasa Inggeris, diikuti oleh bahasa Melayu.*
3. *Calon dikehendaki membaca maklumat di halaman* 2.

Kertas soalan ini mengandungi 26 halaman bercetak.

Lihat Halaman Sebelah

1 Find the value of $0.4593 + 5.2 \times 0.8$ and round off the answer correct to three significant figures.
Cari nilai $0.4593 + 5.12 \times 0.8$ *dan bundarkan jawapan itu betul kepada tiga angka bererti.*

A 4.46
B 4.56
C 4.555
D 4.5553

2 Express 0.00008603 in standard form.
Ungkapkan 0.00008603 *dalam bentuk piawai.*

A 8.603×10^{-5}
B 8.603×10^{-4}
C 8.603×10^{4}
D 8.603×10^{5}

3 $7.28 \times 10^{-7} - 5.6 \times 10^{-9} =$

A 1.68×10^{2}
B 1.68×10^{-7}
C 7.224×10^{2}
D 7.224×10^{-7}

4 7800 kg of curry powder is packed into small packets. Each packet is filled with 60 g of curry powder. *Calculate the number of small packets packed.*
7800 kg serbuk kari dibungkus ke dalam bungkusan kecil . Setiap bungkusan mengandungi 60 *g serbuk kari. Hitung jumlah bungkusan yang terhasil.*

A 1.30×10^{2}
B 1.30×10^{5}
C 4.68×10^{5}
D 4.68×10^{8}

Lihat Halaman Sebelah

5 Express 1234_5 as a number in base eight.
Ungkapkan 1234_5 *sebagai nombor dalam asas lapan.*

A 276_8
B 302_8
C 1136_8
D 2322_8

6 $101100_2 - 1110_2 =$
A 10000_2
B 10100_2
C 10110_2
D 11110_2

7 In Diagram 7, *PQRSTU* and *PUFGH* are regular polygons. *GUJ* and *RSJ* are straight lines.
Dalam Rajah 7, PQRSTU dan PUFGH ialah polygon sekata. GUJ dan RSJ ialah garis lurus.

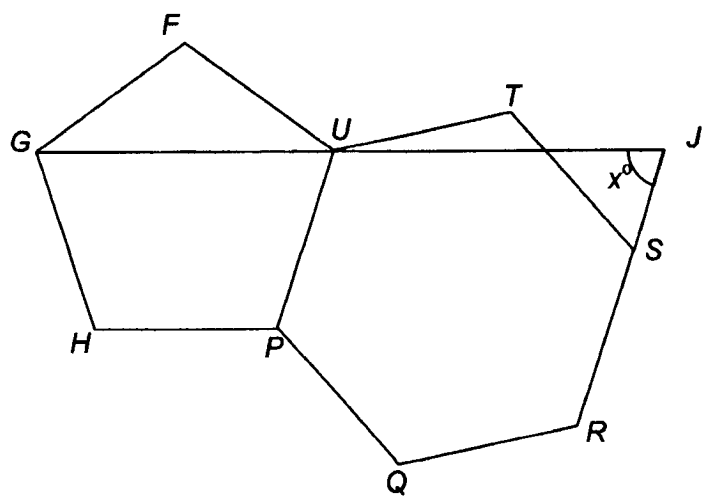


Diagram 7
Rajah 7

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

A 60
B 72
C 90
D 120

Lihat Halaman Sebelah

8 In Diagram 8, *TUV* is an isosceles triangle. *UVP* is a straight line.
Dalam Rajah 8, *TUV* ialah sebuah segi tiga sama kaki. *UVP* ialah garis lurus.

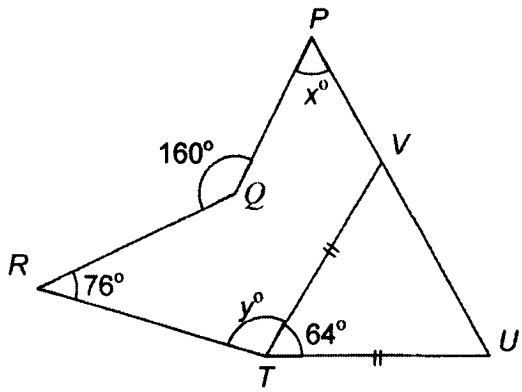


Diagram 8
Rajah 8

Calculate the value of $x + y$.
Hitung nilai $x + y$.

A 142
B 174
C 192
D 200

9 In Diagram 9, *PQR* is a tangent to circle *QUTW* at Q.
STR is a tangent to the circle *QUTW* at point *T*.
Dalam Rajah 9, PQR ialah tangent kepada bulatan QUTW di titik Q.
STR ialah tangent kepada bulatan di titik T.

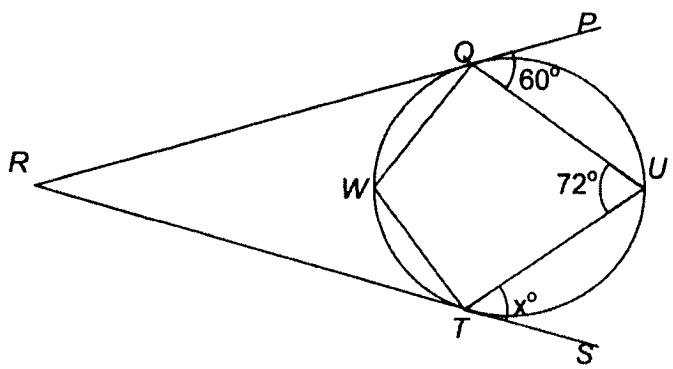


Diagram 9
Rajah 9

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

A 30 **B** 36
C 48 **D** 60

10 Diagram 10 shows point *M* and point *M'* on a Cartesian plane.
Rajah 10 menunjukkan titik M dan titik M' di atas satah Cartesan.

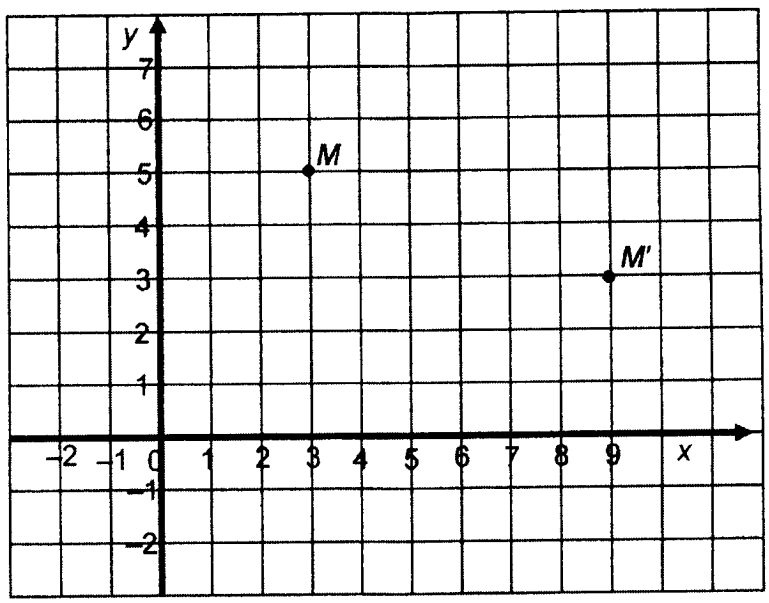


Diagram 10
Rajah 10

Point *M'* is the image of point *M* under a clockwise rotation of 90° about centre *P*.
Titik M' ialah imej bagi titik M bawah satu putaran mengikut arah jam pada pusat P.

The coordinates of centre *P* is
Koordinat bagi pusat P ialah

A (0, 6)
B (5, 1)
C (6, 4)
D (7, 7)

Lihat Halaman Sebelah

11 Diagram 11 shows parallelogram *PQRS* and *VWXY* drawn on a Cartesian plane. *VWXY* is the image of *PQRS* under an enlargement.

Rajah 11 menunjukkan segi empat selari PQRS dan i VWXY dilukis di atas satah Cartesan. Segi empat selari VWXY ialah imej bagi segi empat selari PQRS di bawah satu pembesaran.

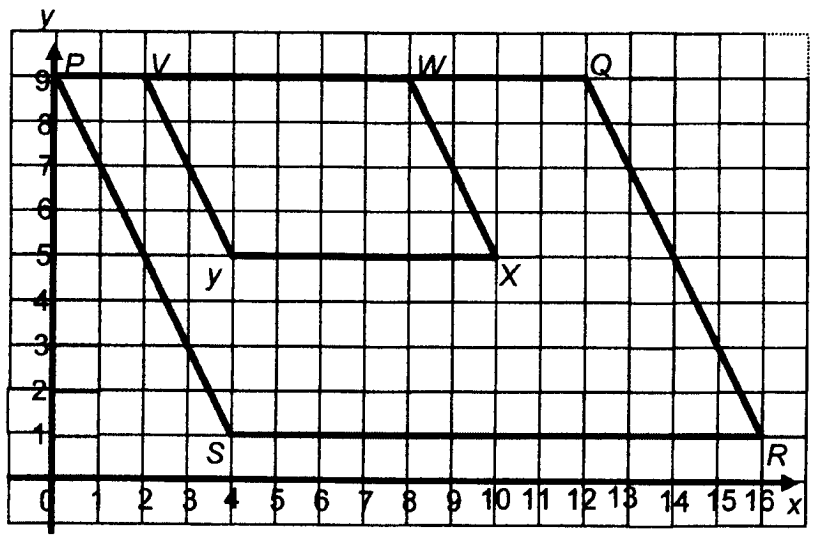


Diagram 11

Rajah 11

The centre and the scale factor of the enlargement are

Pusat dan factor skala pembesaran itu ialah

	Centre of enlargement Pusat pembesaran	Scale factor Faktor scala
A	(5, 9)	2
B	(8, 5)	2
C	(6, 7)	$\frac{1}{2}$
D	(4, 9)	$\frac{1}{2}$

12 In Diagram 12, *TPQ* is a right-angled triangle.
PQRS is a straight line. *TQ* = 26 cm and *QR* = 8 cm.

Dalam Rajah 12, TPQ ialah sebuah segitiga bersudut tegak.
PQRS ialah garis lurus. TQ = 26 cm dan QR = 8 cm.

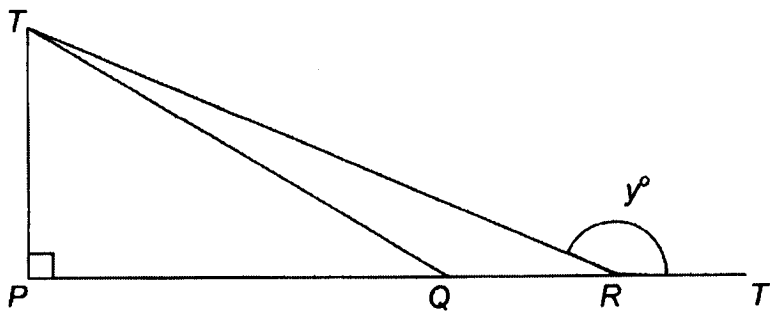


Diagram 12
Rajah 12

Given that cos $\angle PQT = \frac{12}{13}$, find the value of tan y°.

Diberi kos $\angle PQT = \frac{12}{13}$, *cari nilai bagi tan* y°.

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

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

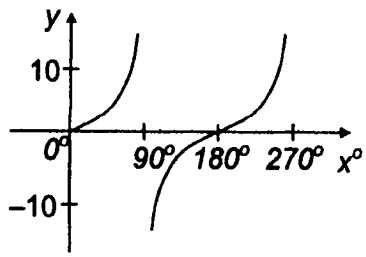
C $-\frac{13}{8}$

D $-\frac{5}{16}$

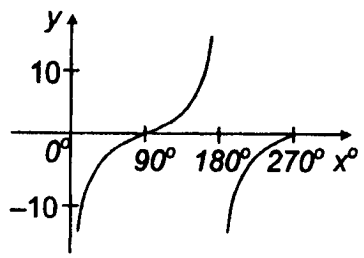
13 Which graph represents $y = \tan x^\circ$ for $0^\circ \leq x \leq 270^\circ$?

Graf manakah yang mewakili $y = \tan x^\circ$ *untuk* $0^\circ \leq x \leq 270^\circ$?

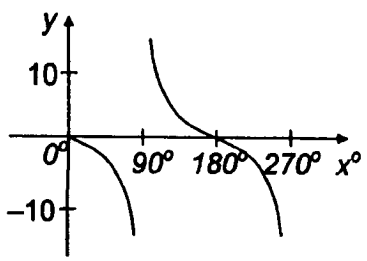
A



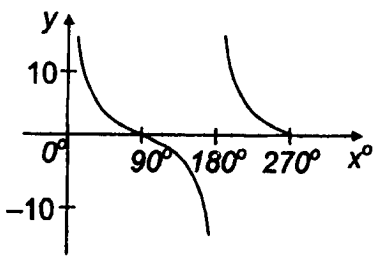
B



C



D



14 Diagram 14 shows a right prism with a rectangular base *MNPQ*. The right - angled triangle *MNS* is the uniform cross section of the prism.

Rajah 14 *menunjukkan sebuah prisma tegak dengan tapak mengufuk MNPQ. Segi tiga tepat MNS ialah keratan rentas seragam bagi prisma tersebut.*

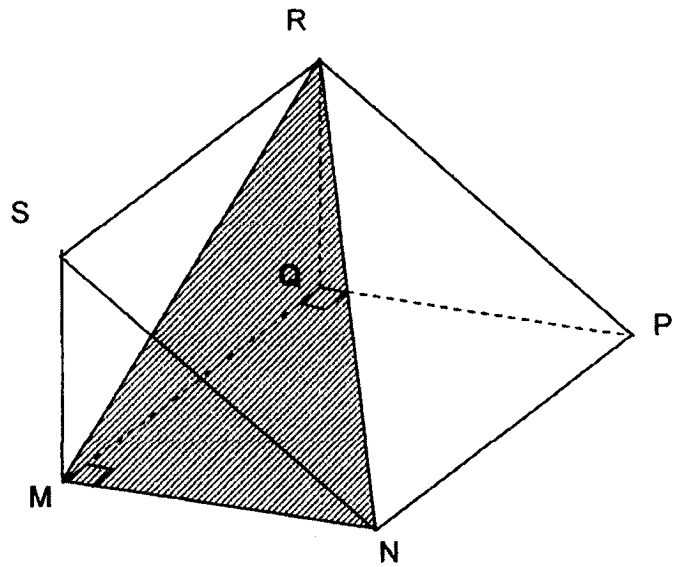


Diagram 14

Rajah 14

Name the angle between the plane *MNR* and the base *MNPQ*.

Namakan sudut di antara satah MNR dengan tapak MNPQ

A $\angle RMQ$

B $\angle RNQ$

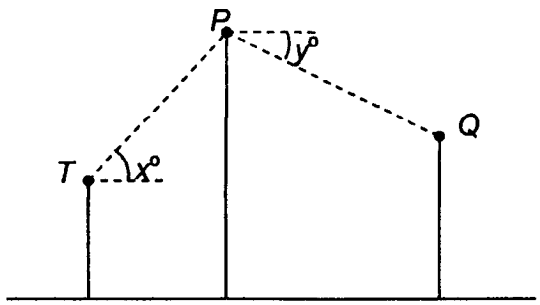
C $\angle RQM$

D $\angle RQN$

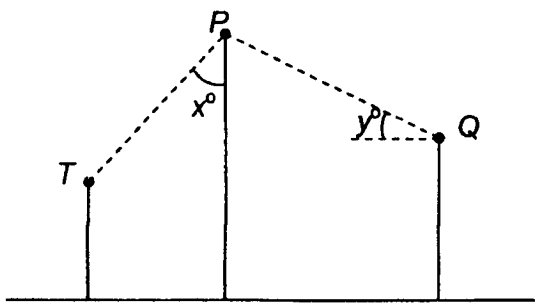
15 *T, P and Q are tips on three vertical poles. Angle of elevation of point P from point T is x°. Angle of depression of point Q from P is y°. Which diagram represents the situation ?*

T, P dan Q adalah puncak-puncak bagi tiga batang tiang tegak. Sudut dongakan titik P dari T ialah x° dan sudut tunduk titik Q dari P ialah y°. Rajah manakah yang mewakili situasi tersebut ?

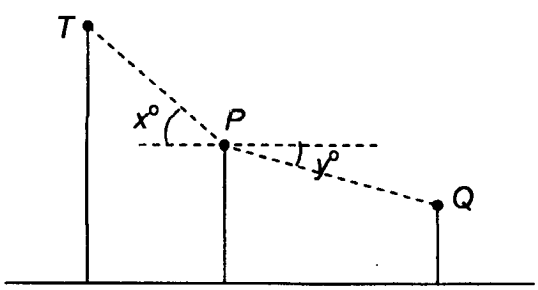
A



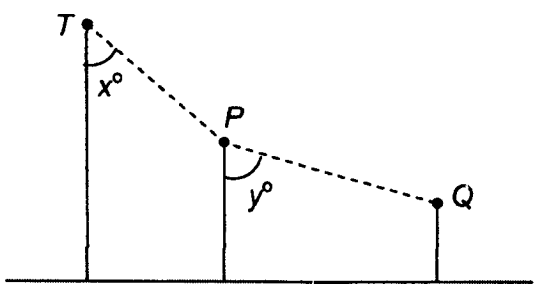
B



C



D



16 In Diagram 16, *HJ* and *KL* are two vertical poles on a horizontal plane.
Dalam Rajah 16, HJ dan KL ialah dua batang tiang tegak pada satah mengufuk.

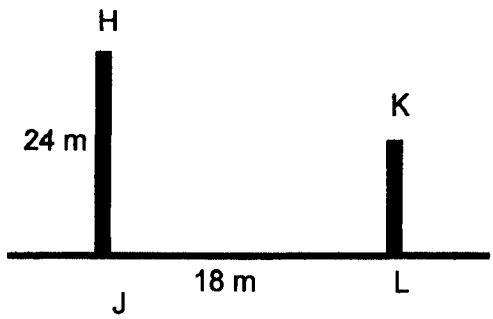


Diagram 16
Rajah 16

The angle of elevation of H from K is 44°
Calculate the height , in m of the pole KL.
Sudut dongakan H dari K ialah 44°
Hitungkan tinggi, dalam m, tiang KL.

A	5.36	**B**	6.62
C	11.05	**D**	11.50

17 Diagram 17 shows three points *P*, *Q*, and *R* on a horizontal plane.
Rajah 17 menunjukkan tiga titik P, Q, dan R pada satah mengufuk

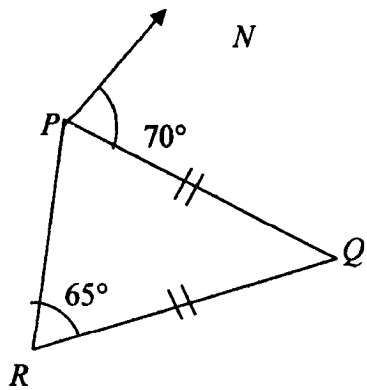


Diagram 17
Rajah 17

Find the bearing of *R* from *Q*.
Cari bearing R dari Q.

A	020 °	**B**	065 °
C	160 °	**D**	200 °

18 Diagram 18, shows three points, *P*, *Q* and *R* on the surface of the earth. *P* and *Q* lies on the equator. *NPS* is the Greenwich Meridian and *O* is the centre of the earth. State the position of point *R*.

Rajah 18 *menunjukan tiga titik, P, Q dan R di atas permukaan bumi. P dan Q terletak di atas khatulistiwa. NPS ialah Meridian Greenwich dan O ialah pusat bumi. Nyatakan kedudukan titik R.*

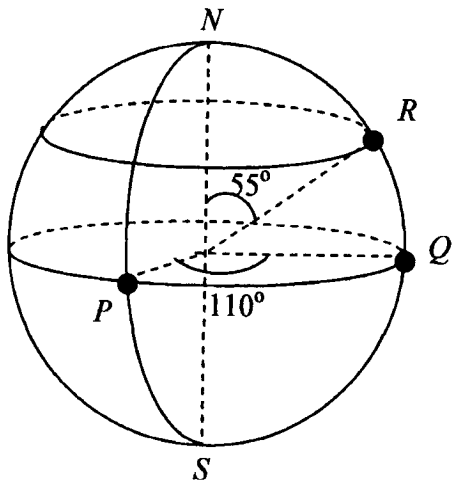


Diagram 18

Rajah 18

A (35° N ,110° E)

B (55° N ,110° E)

C (35° N ,110° W)

D (55° N ,110° W)

19 $(m-2)(m+3)+m(m-4)=$

A $2m^2-3m-6$

B $2m^2-5m-6$

C $2m^2-6m-6$

D $2m^2-9m-6$

20 Express $\frac{7}{12n} - \frac{n-4}{4n^2}$ as a single fraction in its simplest from.

Ungkapan $\frac{7}{12n} - \frac{n-4}{4n^2}$ *sebagai satu pecahan tunggal dalam bentuk termudah.*

A $\frac{n-1}{3n^2}$

B $\frac{n+1}{3n^2}$

C $\frac{n-3}{3n^2}$

D $\frac{n+3}{3n^2}$

21 Given that $p(q+1)-3q=5p$, express q in term of p.

Diberi bahawa $p(q+1)-3q=5p$, *ungkapkan* q *dalam sebutan* p.

A $q=\frac{1-4p}{2}$

B $q=\frac{1-5p}{3-p}$

C $q=\frac{6p}{p-3}$

D $q=\frac{4p}{p-3}$

22 Given that $\frac{1}{2}(h-3)=4-3(h-2)$, calculate the value of h.

Diberi bahawa $\frac{1}{2}(h-3)=4-3(h-2)$, *hitung nilai* h.

A $\frac{5}{4}$

B $\frac{17}{4}$

C $\frac{13}{7}$

D $\frac{23}{7}$

Lihat Halaman Sebelah

23 Which of the following is equivalent to 4^{-3}?

Antara berikut, yang manakah setara dengan 4^{-3} ?

A $\frac{1}{4^3}$

B $-\frac{1}{4^3}$

C $(-4)^3$

D $4^{\frac{1}{3}}$

24 Simplify :

Ringkaskan :

$$\left(pn^{\frac{1}{3}}\right)^6 \times n^2 \div \left(pn^{-1}\right)$$

A n^3

B n^5

C p^5n^3

D p^5n^5

25 List all the integers that satisfy the inequalities $9 - 2x \leq 3$ and $x < 6$.

Senaraikan semua integer yang memuaskan ketaksamaan $9 - 2x \leq 3$ *dan* $x < 6$

A 3, 6

B 4, 5

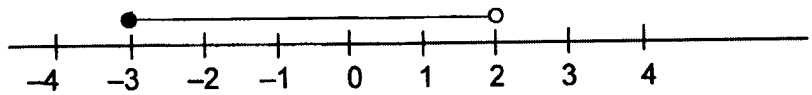
C 3, 4, 5

D 3 ,4, 5, 6

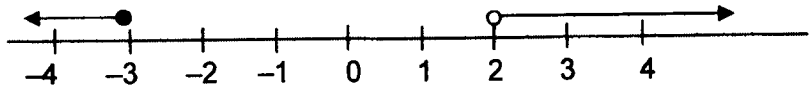
26 Which number line represents the solution of the simultaneous linear inequalities $x > -3$ and $4 - x \geq 2$.

Garis nombor manakah yang mewakili penyelesaian bagi ketaksamaan $x > -3$ *dan* $4 - x \geq 2$.

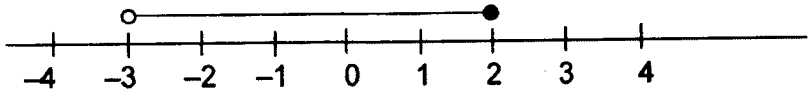
A



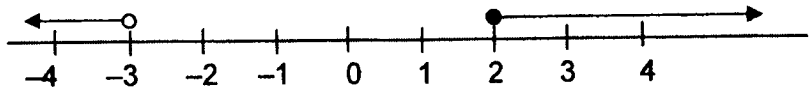
B



C



D



27 Table 27 shows the scores obtained by a group of pupils in a quiz.

Jadual 27 menunjukkan skor yang diperoleh oleh sekumpulan murid dalam satu kuiz.

Score / **Skor**	0	1	2	3	4	5
Frequency / **Kekerapan**	2	2	4	2	6	4

Table 27

Rajah 27

The score mode is

Skor mod ialah

A 2

B 3

C 4

D 6

Lihat Halaman Sebelah

28 In diagram 28 the pie chart represent the number of members each of the three uniformed organization in a school.

Dalam diagram 28, carta pai menunjukkan bilangan ahli 3 badan beruniform di sebuah sekolah .

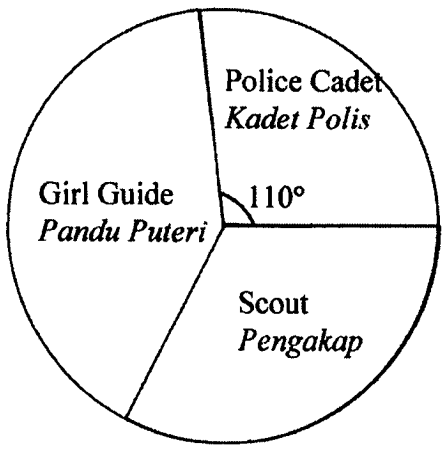


Diagram 28
Rajah 28

There are 220 Police Cadets. The percentages of Scouts is 30%.
Calculate the number of Girl Guide.

Terdapat 220 ahli Kadet Polis. Peratus ahli Pengakap ialah 30%.
Hitung bilangan ahli Pandu puteri tersebut.

A 218
B 220
C 250
D 284

29 The table shows the scores obtained by a group of shooters in a shooting competition.

Jadual menunjukkan skor yang di peroleh oleh sekumpulan penembak dalam pertandingan menembak.

Score ***Skor***	**Frequency x Score** ***Kekerapan x Skor***
1	4
2	4
3	x
4	16
5	15
6	12

If the total frequency is 17, find the value of x.

Jika jumlah frekuenci ialah 17, cari nilai x.

A 3

B 6

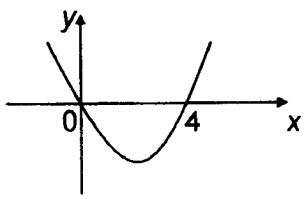
C 12

D 15

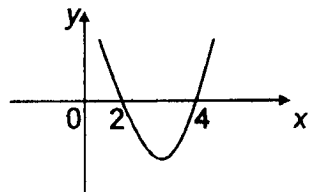
30 Which graph represents $y = 2x^2 - 8x$?

Graf manakah yang mewakili $y = 2x^2 - 8x$?

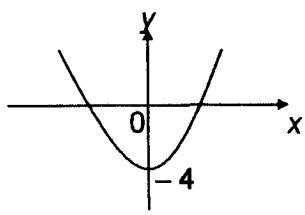
A



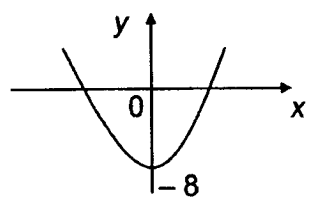
B



C



D



Lihat Halaman Sebelah

31 In diagram 31, the Venn diagram shows universal set, ξ, set P and Q.

Dalam Rajah 31, gambarajah Venn menunjukkan set semesta ξ, set P and Q.

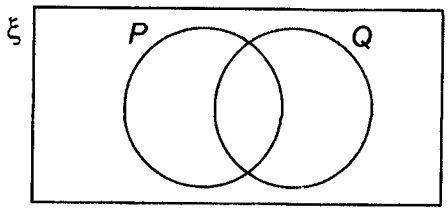


Diagram 31

Rajah 31

Given that $n(P) = 9$, $n(Q) = 13$, $n(P \cap Q) = 5$, $n(P \cup Q)' = 3$. Find $n(\xi)$.

Diberi $n(P) = 9$, $n(Q) = 13$, $n(P \cap Q) = 5$, $n(P \cup Q)' = 3$. Cari $n(\xi)$.

A 17

B 20

C 27

D 30

32 Diagram 32 is a Venn diagram that shows the universal set ξ, A and B.

Rajah 32 ialah gambar rajah Venn yang menunjukkan set semesta ξ, set A dan set B.

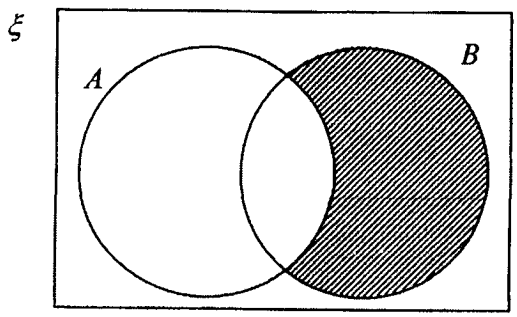


Diagram 32

Rajah 32

The shaded region represents the set

Kawasan berlorek mewakili set

A $A' \cap B$

B $A' \cap B'$

C $B' \cap A$

D $(B \cap A)'$

Lihat Halaman Sebelah

33 Given that the straight line $y - 2x + 6 = 0$ is passing through point B(4, p) . Find the value of p.

Diberi bahawa garis lurus $y - 2x + 6 = 0$ *melalui titik* B(4, p). *Cari nilai bagi* p.

A 2

B 3

C 5

D 6

34 In Diagram 34, GH is a straight line with equation $3y = 2x + 12$

Dalam Rajah 34, GH *ialah garis lurus yang mempunyai persamaan* $3y = 2x + 12$.

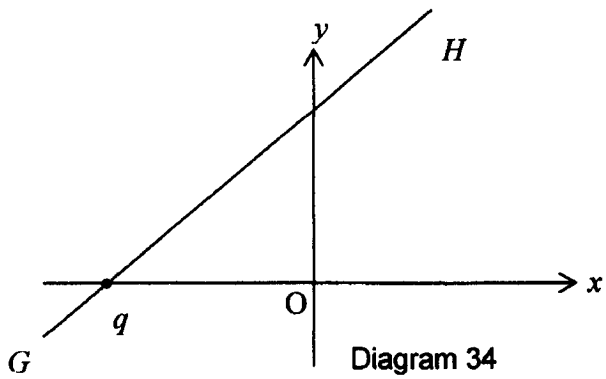


Diagram 34

Rajah 34

Find the value of q

Carikan nilai bagi q

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

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

C -4

D -6

35 Table 35 shows the number of sweets of different flavour in a container.
Jadual 35 menunjukkan bilangan gula yang berlainan perasa dalam sebuah bekas.

Flavour *Perasa*	Maize *Jagung*	Mango *Mangga*	Orange *Oren*	Pineapple *Nanas*
Number of sweets *Bilangan gula*	16	22	32	10

Table 35
Jadual 35

A sweet is chosen at random from the container.
Find the probability that the sweet is of mango flavoured.
Sebiji gula dipilih secara rawak daripada bekas tersebut.
Cari kebarangkalian bahawa gula yang terpilih itu berperasa mangga.

A $\frac{1}{22}$ **B** $\frac{11}{29}$

C $\frac{11}{40}$ **D** $\frac{1}{80}$

36 There are 60 red marbles and some white marbles in a basket. The probability of choosing a red marble at random from the basket is $\frac{2}{5}$. Calculate the number of white marbles.

Terdapat 60 biji guli merah dan beberapa biji guli putih di dalam sebuah bakul. .
Kebarangkalian bahawa guli merah dipilih secara rawak di dalam bakul ialah $\frac{2}{5}$.
Hitungkan bilangan guli putih.

A 24
B 36
C 90
D 96

37 Given that y varies inversely as square root of x and that $y = 20$ when $x = \frac{1}{25}$.

Calculate the value of x when $y = 9$.

Diberi y berubah secara songsang dengan punca kuasa dua x dan y = 20 apabila $x = \frac{1}{25}$. *Hitung nilai x apabila y = 5*

A $\frac{2}{3}$

B $\frac{2}{9}$

C $\frac{4}{9}$

D $\frac{16}{81}$

38 It is given that R varies directly as the cube of S and inversely as the square of T. Find the relation between R, S, and T.

Diberi bahawa R berubah secara langsung dengan kuasa tiga S dan secara songsang dengan kuasa dua T.
Cari hubungan antara R, S dan T

A $R \alpha \frac{S^3}{\sqrt{T}}$

B $R \alpha \frac{\sqrt{T}}{S^3}$

C $R \alpha \frac{S^3}{T^2}$

D $R \alpha \frac{T^2}{S^3}$

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

A $\begin{pmatrix}21 & 7\end{pmatrix}$

B $\begin{pmatrix}18\\ -11\end{pmatrix}$

C $\begin{pmatrix}24 & 8\\ -3 & -15\end{pmatrix}$

D $\begin{pmatrix}24 & -6\\ 4 & -15\end{pmatrix}$

40 Find the value of x in following matrix equation:

Cari nilai x dalam persamaan matriks berikut :

$$\begin{pmatrix}9\\ 6\end{pmatrix} - 2\begin{pmatrix}-x\\ 2\end{pmatrix} = \begin{pmatrix}1\\ 2\end{pmatrix}$$

A -8

B -4

C 5

D 6

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

Answers For Paper 1(Mathematics SPM Julang 2010)

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

1449/2
Mathematics
Kertas 2
September
2010
2½ jam

Nama:.....

Tingkatan: .....

JABATAN PELAJARAN NEGERI JOHOR

PEPERIKSAAN PERCUBAAN SPM 2010

MATHEMATICS

Kertas 2

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tuliskan **nama** dan **tingkatan** pada ruang yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Melayu atau bahasa Inggeris.*
5. *Calon dikehendaki membaca arahan di halaman 2.*

Untuk Kegunaan Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A	1	3	
	2	4	
	3	4	
	4	3	
	5	5	
	6	5	
	7	6	
	8	5	
	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

For examiner's use

Section A
Bahagian A

[52 *marks*]
[52 *markah*]

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

1 The Venn diagram in the answer space shows sets A, B, and C, such that the universal set, $\xi = A \cup B \cup C$.

Gambar rajah Venn di ruang jawapan menunjukkan set A, set B dan set C dengan keadaan set semesta, $\xi = A \cup B \cup C$.

On the diagrams in the answer space, shade

Pada rajah di ruang jawapan, lorek

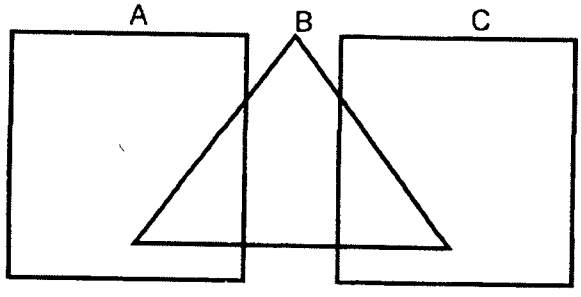
a) Set $B \cap C$,

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

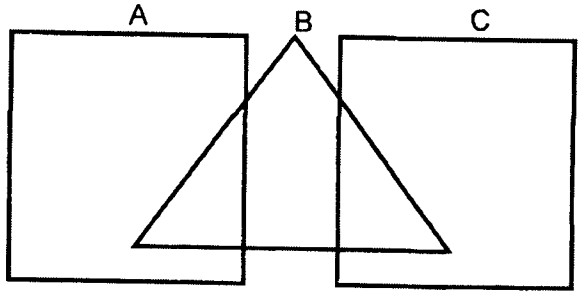
[3 marks]
[3 *markah*]

Answer / *Jawapan:*

(a)



(b)



For examiner's use

2 Calculate the value of u and of w that satisfy the following simultaneous linear equations:

Hitung *nilai u dan nilai w yang memuaskan persamaan linear serentak berikut*:

$$2u + \frac{1}{3}w = 3$$
$$3u - w = 9$$

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

Answer / *Jawapan:*

---

3 Solve the following quadratic equation:

Selesaikan persamaan kuadratik berikut:

$$2x^2 - 5x + 2 = 2(2 - x)$$

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

Answer / *Jawapan*:

For examiner's use

4.

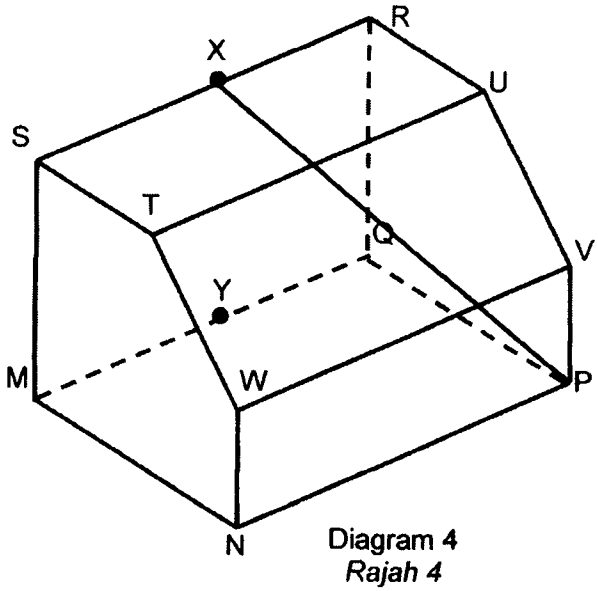


Diagram 4
Rajah 4

Diagram 4, shows a right prism. *MNWTS* is the uniform cross section of the prism. *MNPQ* is the horizontal base of the right prism.
MN = 8 cm, *NP* = 12 cm, and *MS* = 11 cm. *X* is a midpoint of *SR* and *Y* is a midpoint of *MQ*.

Rajah 4 menunjukkan sebuah prisma tegak. MNWTS ialah keratan rentas seragam prisma itu. MNPQ adalah tapak mengufuk bagi prisma itu.
MN = 8 cm, NP =12 cm dan MS = 11 cm. X ialah titik tengah bagi SR dan Y ialah titik tengah bagi MQ.

Identify and calculate the angle between the line *PX* and the base *MNPQ* .
Kenalpasti dan hitung sudut di antara garis PX dengan tapak MNPQ.

[3 marks]
[*3 markah*]

Answer / *Jawapan* :

For examiner's use

5 (a) State whether the following sentence is a statement or non-statement.
Nyatakan sama ada ayat berikut adalah pernyataan atau bukan pernyataan.

"15 is a prime number"
"15 ialah nombor perdana"

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

$5m - 4 < 16$ if and only if $m < 4$
$5m - 4 < 16$ jika dan hanya jika $m < 4$

(c) Make a general conclusion by induction for the sequence of numbers 4, 18 , 42, 76, ... which follows the following pattern.
Buat satu kesimpulan umum secara aruhan bagi urutan nombor 4, 18, 42, 76, ... *yang mengikut pola berikut.*

$5(1)^2 - 1 = 4$
$5(2)^2 - 2 = 18$
$5(3)^2 - 3 = 42$
$5(4)^2 - 4 = 76$
....

[5 marks]
[5 markah]

Answer/ *Jawapan* :

(a) .....

(b) Implication 1 / *Implikasi 1* :

.....

Implication 2 / *Implikasi 2* :

.....

(c) .....

For examiner's use

6. Diagram 6 shows a trapezium *PQRS* drawn on a Cartesian plane. *PQ* is parallel to *SR*.

Rajah 6 menunjukkan trapezium PQRS dilukis pada suatu satah Cartesan. PQ adalah selari dengan SR.

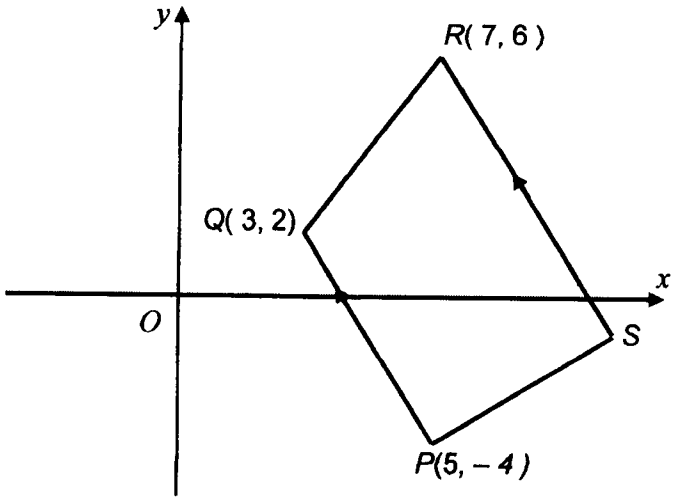


Diagram 6

Rajah 6

Find

Cari

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

persamaan bagi garis lurus SR,

(b) the x–intercept of the straight line *SR*.

pintasan–x bagi garis lurus SR.

[5 marks]

[*5 markah*]

Answer / *Jawapan:*

(a)

(b)

For examiner's use

7 The inverse matrix of $\begin{pmatrix} 3 & -2 \\ -1 & 4 \end{pmatrix}$ is $\frac{1}{k}\begin{pmatrix} 4 & n \\ 1 & 3 \end{pmatrix}$

Matriks songsang bagi $\begin{pmatrix} 3 & -2 \\ -1 & 4 \end{pmatrix}$ *ialah* $\frac{1}{k}\begin{pmatrix} 4 & n \\ 1 & 3 \end{pmatrix}$

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

Cari nilai n dan nilai k.

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

Tulis persamaan linear serentak berikut dalam bentuk persamaan matriks:

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

$$-x + 4y = 17$$

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

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

[6 marks]

[*6 markah*]

Answer / *Jawapan* :

(a)

(b)

For examiner's use

8. Diagram 8 shows a combined solid consists of a right pyramid and the half-cylinder, which are joined at the plane *ABCD*. *E* is vertically above the base *ABCD*.

Rajah 8 menunjukkan gabungan sebuah pepejal yang terdiri daripada sebuah piramid tegak dan sebuah separuh silinder yang tercantum pada satah ABCD. E berada tegak di atas tapak ABCD.

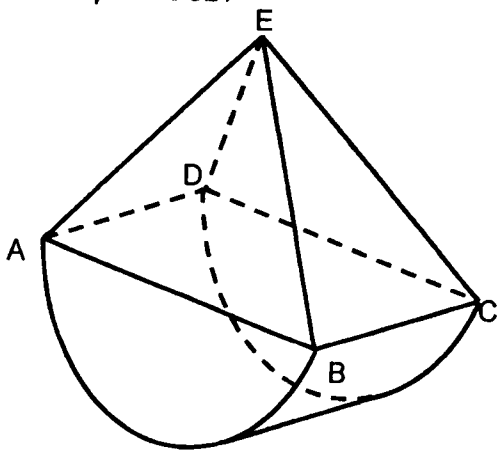


Diagram 8
Rajah 8

Given that, *AB* = 14 cm, *BC* = 5 cm and the volume of the composite solid is 595 cm^3.
Using $\pi = \frac{22}{7}$, calculate

Diberi, AB = 14 cm, BC = 5 cm dan isipadu gabungan pepejal itu ialah 595 cm^3.
Menggunakan $\pi = \frac{22}{7}$, *hitung*

(a) the volume, in cm^3, of the half-cylinder,
isipadu, dalam cm^3, bagi separuh silinder itu,

(b) the height, in cm, of the pyramid.
tinggi, dalam cm, piramid itu.

[5 marks]
[5 *markah*]

Answer / *Jawapan*:

(a)

(b)

For examiner's use

9. Diagram 9, shows five labelled cards which are put into a box.

Rajah 9, menunjukkan lima kad berlabel yang dimasukkan ke dalam sebuah kotak.

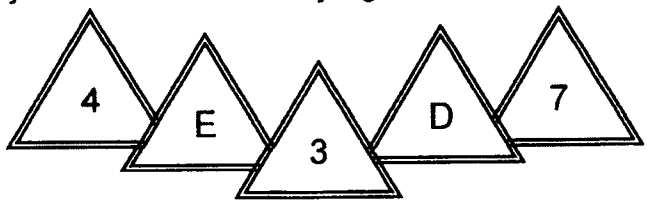


Diagram 9
Rajah 9

Two cards are picked at random from the box, one after another, without replacement.
Dua kad dipilih secara rawak daripada kotak itu, satu demi satu, tanpa pengembalian.

(a) List the sample space.
Senaraikan ruang sample.

(b) List all the outcomes of the events and find the probability that
Senaraikan semua kesudahan peristiwa dan cari kebarangkalian bahawa

(i) both cards are labelled with a letter,
kedua – dua kad dilabel dengan huruf,

(ii) the first card is labelled with an odd number **or** the second card is labelled with a consonant.
kad pertama dilabel dengan nombor ganjil ***atau*** *kad kedua dilabel dengan huruf konsonan.*

[6 marks]
[6 *markah*]

Answer / *Jawapan* :
(a)

(b) (i)

(ii)

For examiner's use

10 In Diagram 10, OPQR and OMN are sectors of a circle with centre O.
Dalam Rajah 10, OPQR dan OMN ialah dua sektor bulatan, kedua-duanya berpusat O.

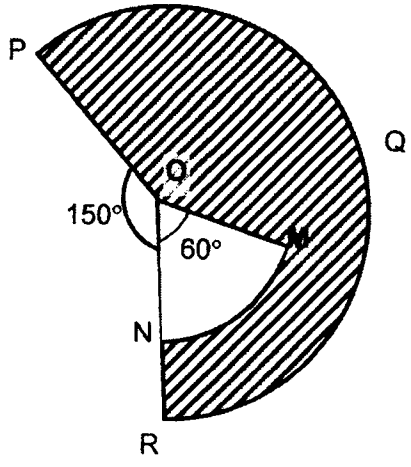


Diagram 10
Rajah 10

It is given that *OP* = 12 cm and *ON* = 7 cm.
Using $\pi = \frac{22}{7}$, calculate

Diberi bahawa OP = 12 cm dan ON = 7 cm.
Guna $\pi = \frac{22}{7}$, *hitung*

(a) the perimeter, in cm, of the shaded region,
perimeter, dalam cm, *kawasan yang berlorek,*

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

[6 marks]
[*6 markah*]

Answer / *Jawapan* :
(a)

(b)

For examiner's use

11 Diagram 11 shows the speed-time graph for the movement of a particle for a period of 20 seconds.
Rajah 11 menunjukkan graf laju-masa bagi pergerakan satu zarah dalam tempoh 20 saat.

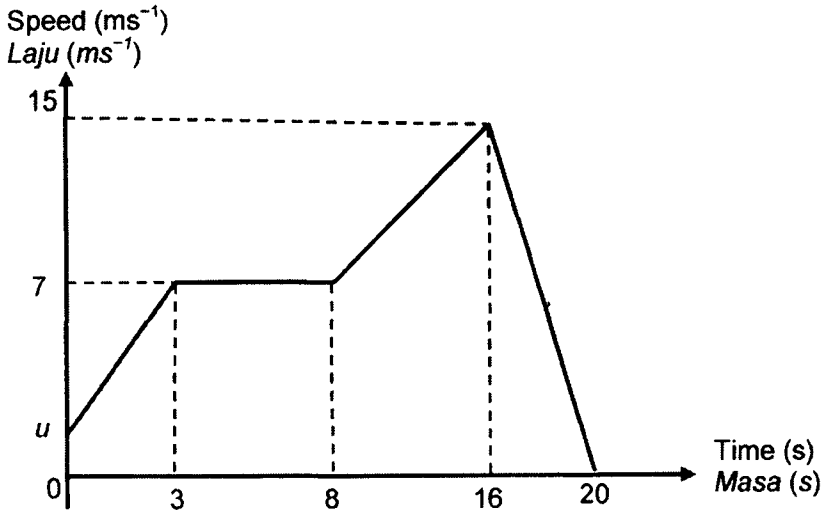


Diagram 11
Rajah 11

(a) State the uniform speed, in ms^{-1}, of the particle.
Nyatakan laju seragam, dalam ms^{-1}, zarah itu.

(b) Given that the rate of change of speed in the first 3 seconds is 2 ms^{-2}, calculate the value of *u*.
Diberi kadar perubahan laju, dalam 3 saat yang pertama ialah 2 ms^{-2}, hitung nilai u.

(c) Calculate the distance travelled, in m, by the particle for the last 12 seconds.
Hitung jarak yang dilalui oleh zarah itu, dalam m, bagi 12 saat yang terakhir.

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

Answer / *Jawapan* :
(a)

(b)

(c)

For examiner's use

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 12 in the answer space for the equation $y = 3x^2 + 2x - 18$ by writing down the values of y when $x = -4$ and $x = 3$. [2 marks]

Lengkapkan Jadual 12 di ruang jawapan bagi persamaan $y = 3x^2 + 2x - 18$ *dengan menulis nilai-nilai y apabila* $x = -4$ *dan* $x = 3$. [2 *markah*]

(b) For this part of the question, use the graph paper provided on page 18.
You may use a flexible curve rule.

Untuk ceraian soalan ini, gunakan kertas graf yang disediakan pada halaman 18. Anda boleh menggunakan pembaris boleh lentur.

Using a 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 $y = 3x^2 + 2x - 18$ for $-4 \le x \le 3$. [4 marks]

Menggunakan skala 2 cm kepada 1 unit pada paksi-x dan 2 cm kepada 5 unit pada paksi-y, lukis graf $y = 3x^2 + 2x - 18$ *untuk* $-4 \le x \le 3$. [4 *markah*]

(c) From your graph, find
Dari graf anda, cari

(i) the value of y when $x = 2.6$,
nilai y apabila $x = 2.6$,

(ii) the value of x when $y = -8$.
Nilai x apabila $y = -8$.

[2 marks]
[2 *markah*]

(d) Draw a suitable straight line on your graph, to find the values of x which satisfy the equation $0 = 3x^2 + 5x - 17$ for $-4 \le x \le 3$.
State these values of x. [4 marks]

Lukis satu garis lurus yang sesuai pada graf anda *untuk mencari nilai-nilai x yang memuaskan persamaan* $0 = 3x^2 + 5x - 17$ *bagi* $-4 \le x \le 3$.
Nyatakan nilai-nilai x itu. [4 *markah*]

For examiner's use

Answer / *Jawapan*:

12 *(a)*

x	-4	-3	-2	-1	0	1	2	2.5	3
y		3	-10	-17	-18		-2	5.75	15

Table 12
Jadual 12

(b) Refer graph on page 19.
Rujuk graf di halaman 19.

(c) (i) y = ...

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

(d) x = ..., ...

For examiner's use

13 (a) Diagram 13(i) shows two points, L and M on a Cartesian plane.
Rajah 13(i) menunjukkan dua titik, L dan M pada suatu satah Cartesan.

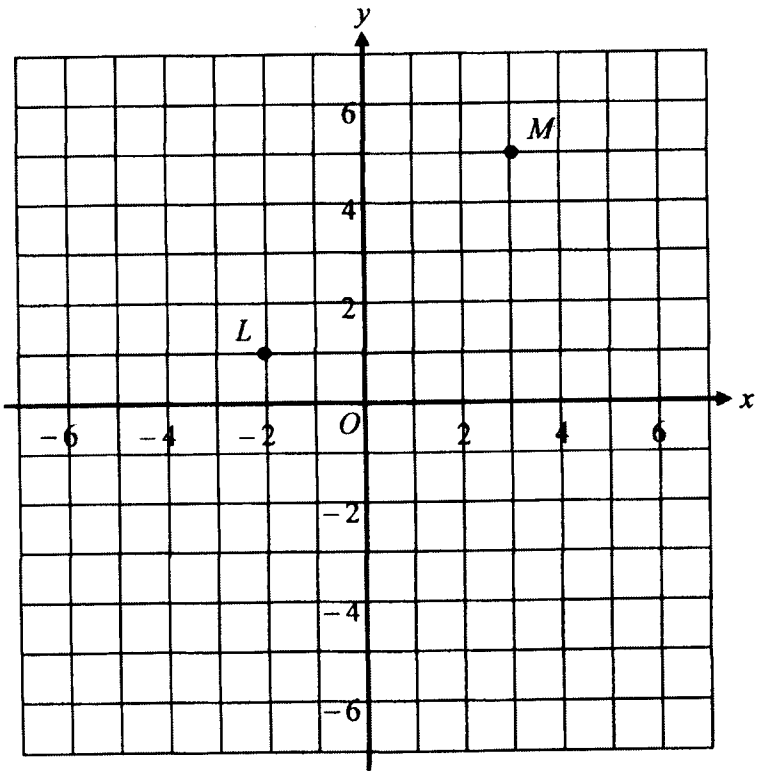


Diagram 13(i)
Rajah 13(i)

Transformation T is a translation $\begin{pmatrix} 1 \\ -4 \end{pmatrix}$

Transformation P is a rotation of 90^0 anticlockwise about centre (1,2).

Penjelmaan T ialah satu translasi $\begin{pmatrix} 1 \\ -4 \end{pmatrix}$

Penjelmaan P ialah satu putaran 90^0 lawan arah jam pada pusat (1,2).

(i) Find the coordinates of the image of point M under transformation T.
Cari koordinat imej bagi titik M di bawah penjelmaan T.

(ii) Find the coordinates of the image of point L under the
(a) transformations P
(b) combined transformation PT.

Cari koordinat imej bagi titik L di bawah
(a) penjelmaan P,
(b) gabungan penjelmaan PT.

[4 marks]
[4 markah]

For examiner's use

(b) Diagram 13(ii) shows three quadrilaterals *ABCD*, *EFGH* and *PQRS*, drawn on a Cartesian plane.
Rajah 13(ii) menunjukkan tiga segiempat, ABCD, EFGH dan PQRS, dilukis pada suatu satah Cartesan.

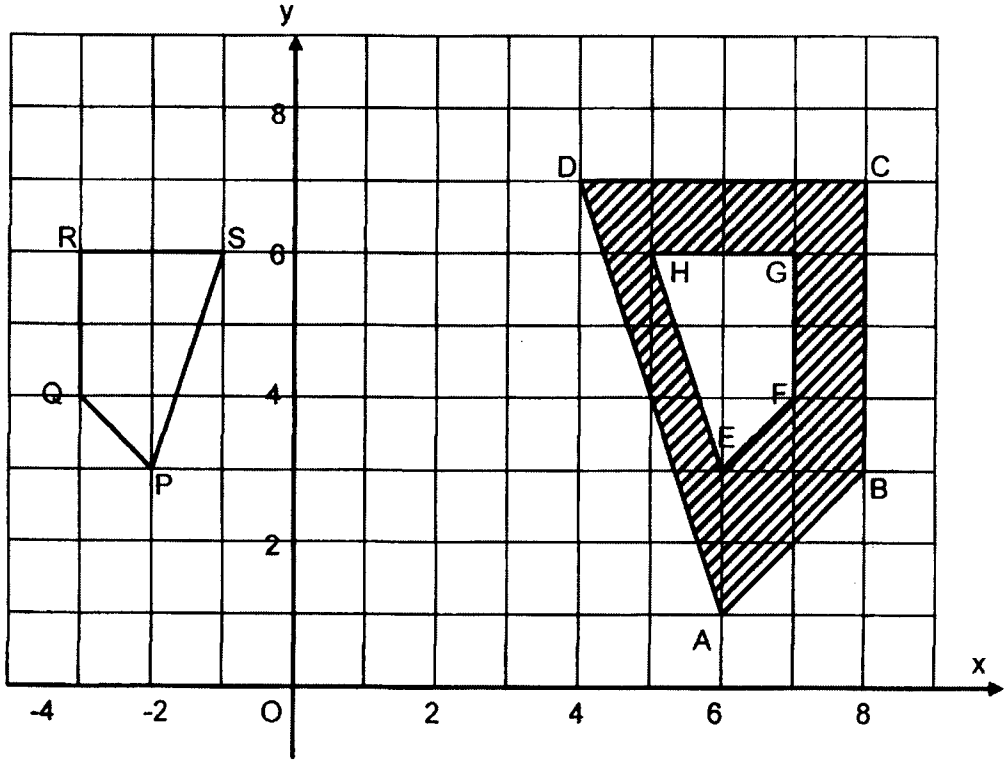


Diagram 13(ii)
Rajah 13(ii)

(i). *ABCD* is the image of *PQRS* under a combined transformation *WV*.
ABCD ialah imej bagi PQRS di bawah gabungan penjelmaan WV.

Describe in full the transformation
Huraikan selengkapnya penjelmaan
(a) *V*,
(b) *W*.

(ii) It is given that the quadrilateral *ABCD* represents a region of area 128 m^2. Calculate the area, in m^2, of the shaded region.

Diberi bahawa segiempat ABCD mewakili sebuah kawasan dengan luas 128 m^2. Hitung luas, dalam m^2, kawasan yang berlorek.

[8 marks]
[8 *markah*]

For examiner's use

Answer / *Jawapan* :

13 (a) (i) .....

(ii) (a).....

(b).....

(b) (i) (a).....

.....

(b).....

.....

(ii) .....

.....

For examiner's use

14 The histogram in Diagram 14 shows the donation, in RM, collected by 50 pupils.
Histogram dalam Rajah 14 menunjukkan derma, dalam RM, yang dikutip oleh 50 orang murid.

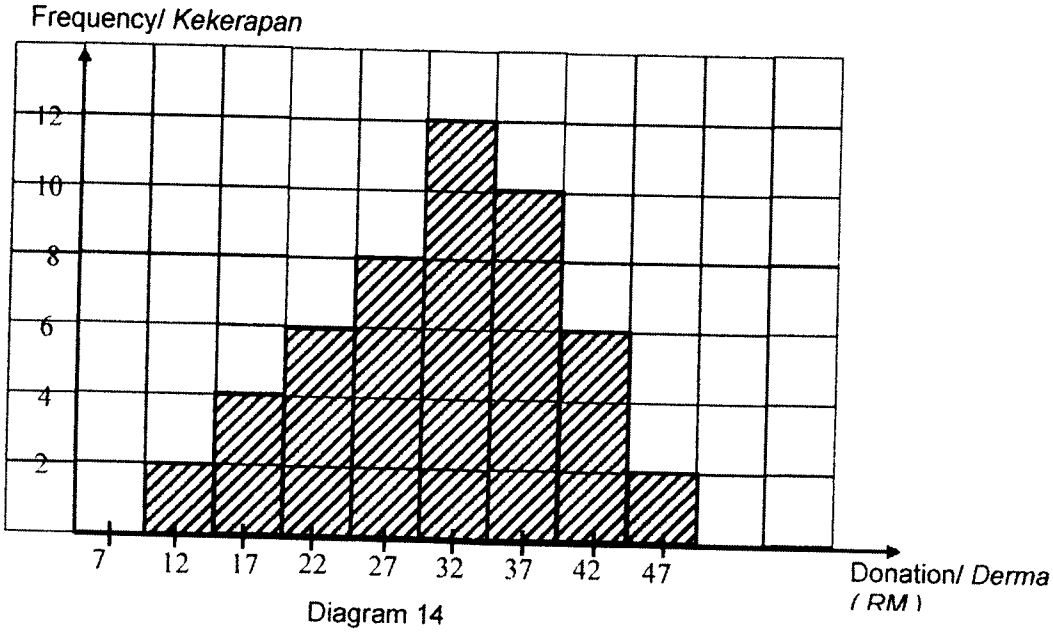


Diagram 14
Rajah 14

(a) Based on Diagram 14, complete Table 14 in the answer space. [3 marks]
Berdasarkan Rajah 14, lengkapkan Jadual 14 di ruang jawapan. [3 *markah*]

(b) Based on Table 14,
Berdasarkan Jadual 14,

i. State the size of the class interval,
Nyatakan saiz selang kelas,

ii Calculate the estimated mean of the donation collected by a pupil.
Hitungkan min anggaran kutipan derma bagi seorang murid.

[4 marks]
[4 *markah*]

(c) For this part of the question, use the graph paper provided on page 24.
Untuk ceraian soalan ini , gunakan kertas graf yang disediakan di halaman 24.

By using a scale of 2 cm to RM 5 on horizontal axis and 2 cm to 5 pupils on the vertical axis , draw an ogive for the data.
Dengan menggunakan skala 2 cm kepada RM 5 pada paksi mengufuk dan 2 cm kepada 5 orang murid pada paksi mencancang, lukis satu ogif bagi data tersebut.

[4 marks]
[4 *markah*]

(d) Based on the ogive in 14(c), state the number of pupils who collected less than RM33.
Berdasarkan ogif di dalam 14(c), nyatakan bilangan murid yang telah mengutip kurang daripada RM33.

[1 mark]
[1 *markah*]

For examiner use

Answer/ *Jawapan*:

(a)

Donation / *Derma* (RM)	Midpoint/ *Titik Tengah*	Frequency/ *Kekerapan*	Upper Boundary/ *Sempadan Atas*	Cumulative Frequency/ *Kekerapan Longgokan*
5 - 9	7			
10 - 14	12			
15 - 19	17			
20 -24	22			
25 – 29	27			
30 – 34	32			
35 – 39	37			
40 – 44	42			
45 – 49	47			

Table 14
Jadual 14

(b) i. .....

ii.

(c) Refer graph on page 24.
Rujuk graf di halaman 24.

(d)

For examiner's use

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

(a) Diagram 15(i) shows a solid right prism with a rectangular base *ABCD* on a horizontal plane. The surface *BCLJH* is the uniform-cross section of the prism. The rectangles *GHJF* and *ELJF* are inclined planes. *AG*, *BH*, *CL* and *DE* are vertical edges. *F* is vertically above M and *J* is vertically above *N*.
FM = *JN* = 7 cm, *AM* = *BN* = 2 cm and *AD* = *BC* = 6 cm.

Rajah *15(i) menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segiempat tepat ABCD terletak di atas satah mengufuk. Segiempat tepat GHJF dan ELJF ialah satah condong. Tepi AG, BH, CL dan DE adalah tegak. F berada tegak di atas M dan J berada tegak di atas N.*
FM = JN = 7cm, AM = BN = 2cm dan AD = BC = 6 cm.

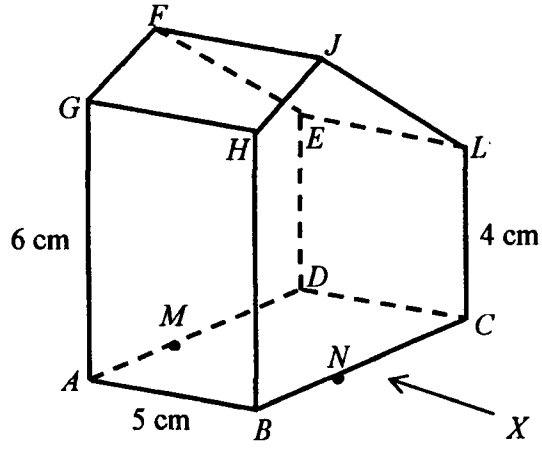


Diagram 15(i)
Rajah 15(i)

Draw full scale, the elevation of the solid on a vertical plane parallel to *BC* as viewed from *X*. [3 *marks*]

Lukis dengan skala penuh, dongakan pepejal itu pada satah mencancang yang selari dengan BC sebagaimana dilihat dari X. [3 *markah*]

Answer / *Jawapan :*

15 (a)

For examiner's use

(*b*) Another solid cuboid is joined to the solid in Diagram 15(i) at the vertical plane *BCLT*. The composite solid is as shown in Diagram 15(ii). The base *ABPQCD* is on a horizontal plane.

Sebuah pepejal lain berbentuk kuboid dicantumkan kepada prisma dalam Rajah 15(i) pada satah mencancang BCLT. Gabungan pepejal adalah seperti yang ditunjukkan dalam Rajah 15(ii). Tapak ABPQCD terletak di atas satah mengufuk.

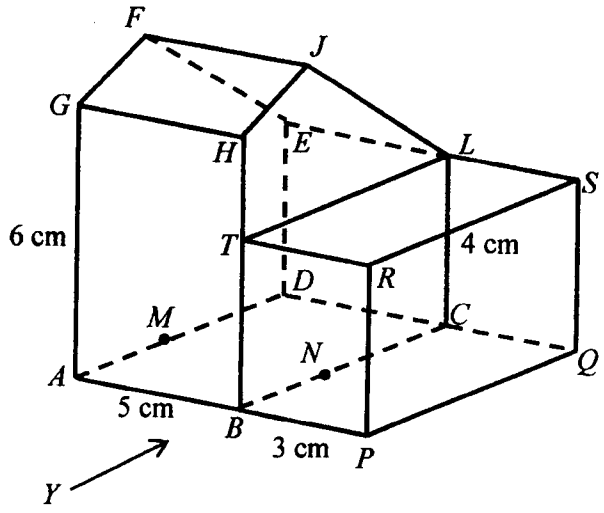


Diagram 15 (ii).
Rajah 15(ii)

Draw full scale,
Lukis dengan skala penuh,

(i) the plan of the combined solid, [4 *marks*]
pelan gabungan pepejal itu, [4 *markah*]

(ii) the elevation of the combined solid on a vertical plane parallel to *ABP* as viewed from *Y*. [5 *marks*]
dongakan pepejal itu pada satah mencancang yang selari dengan ABP sebagaimana dilihat dari Y. [5 *markah*]

For examiner's use

Answer/ *Jawapan :*

(*b*) (i)

(ii)

For examiner's use

16 Diagram 16 shows four points *P*, *Q*, *R* and *S*, on the surface of the earth. *P* lies on longitude 100° *W*. *PQ* is the diameter of the earth and *PR* is the diameter of the parallel of latitude 65°*N*.

Rajah 16 menunjukkan empat titik P, Q, R and S, di atas permukaan bumi. P terletak pada longitud 100°B. PQ ialah diameter bumi dan PR adalah diameter selarian latitud 65°U.

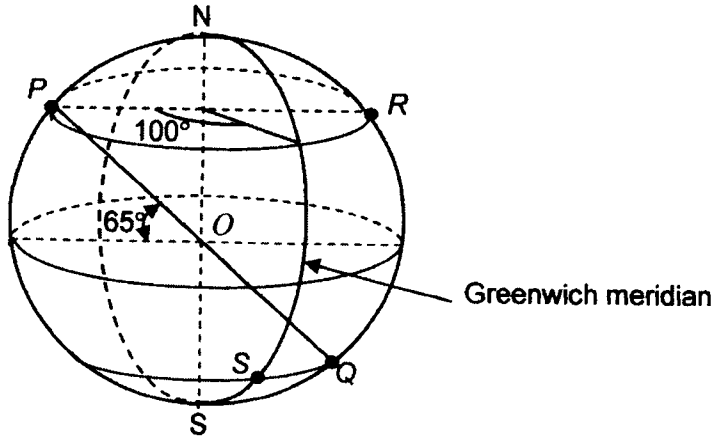


Diagram 16
Rajah 16

(a) i) State the latitude of Q.
Nyatakan latitud bagi Q.

ii) State the location of R.
Nyatakan lokasi bagi R.

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

(b) Calculate the shortest distance, in nautical miles, from *Q* to *R*, measured along the surface of the earth.
Hitungkan jarak terpendek, dalam batu nautika, dari Q ke R, diukur sepanjang permukaan bumi.

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

(c) Calculate the distance, in nautical mile, from *S* due east to *Q* measured along the common parallel latitude.
Hitung jarak, dalam batu nautika, dari *S arah ke timur Q diukur sepanjang selarian latitud sepunya.*

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

(d) An aeroplane took off from *S* and flew due east to *Q* and then fly due north to *R*. If the average speed for the whole flight is 550 knots, calculate the total time taken, in hours, for the whole flight.

Sebuah kapal terbang berlepas dari S arah ke timur ke Q dan seterusnya arah ke utara ke R. Jika purata laju seluruh penerbangan kapal terbang itu ialah 550 knot, hitung jumlah masa yang diambil untuk seluruh penerbangan itu.

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

For examiner's use

Answer / Jawapan :

(a). (i)

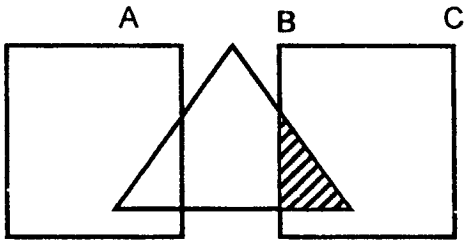
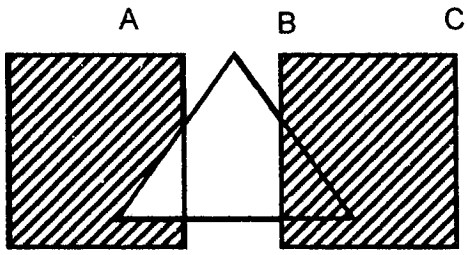
(ii)

(b)

(c)

(d)

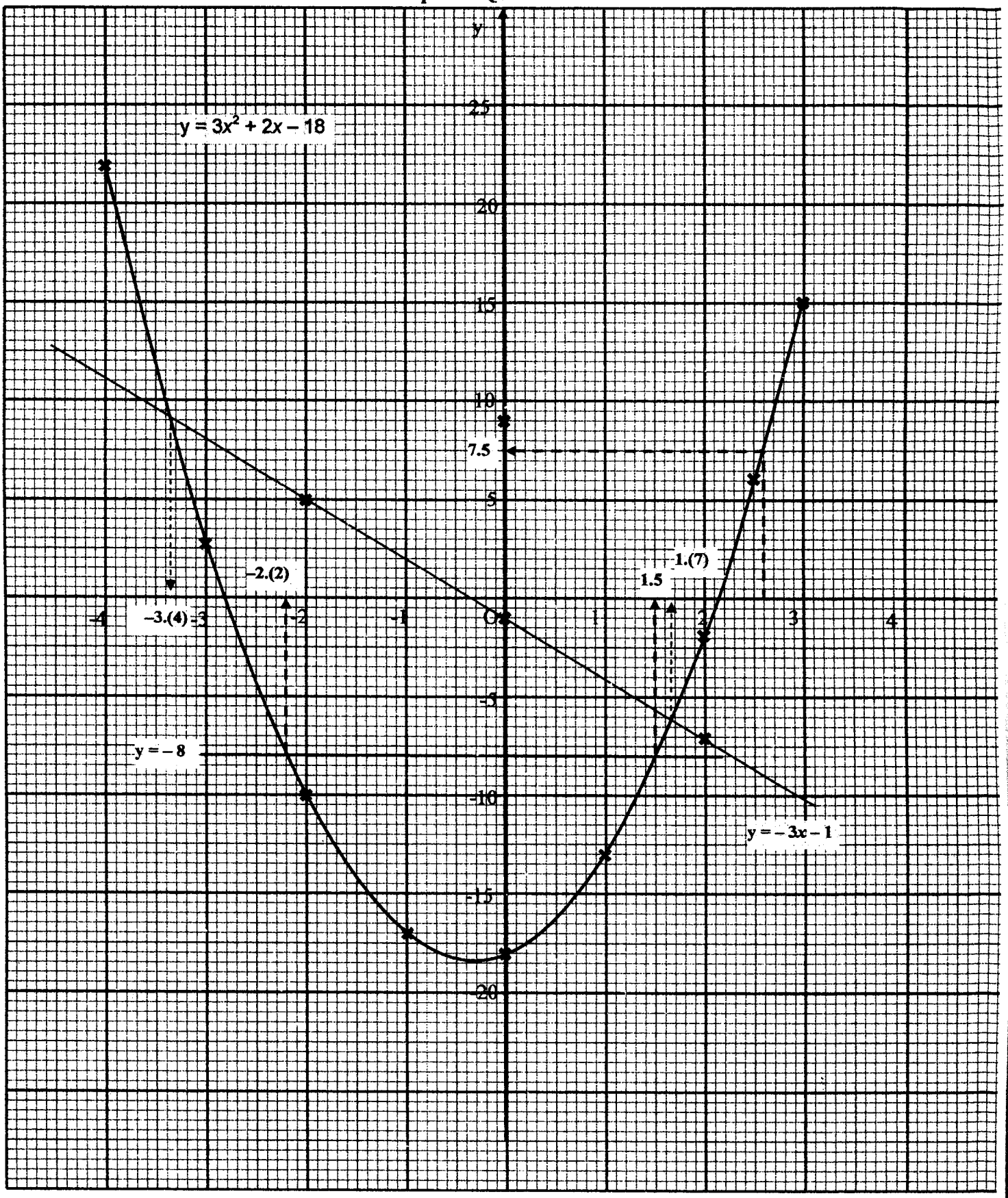
END OF QUESTION PAPER
KERTAS SOALAN TAMAT

No		Answers	Marks
1		(a)  (b)  	P1 P2
		Subtotal	3
2		6u + w = 9 or w = 9 – 6u or equivalent 9u = 18 or equivalent u = 2 w = -3	K1 K1 N1 N1
		Subtotal	4
3		$2x^2 - 3x - 2 = 0$ (2x + 1)(x – 2) = 0 $x = -\frac{1}{2}$, x = 2	K1 K1 N1 N1
		Subtotal	4
4		$\angle$ XPY or $\angle$ YPX Tan $\angle$ XPY = $\frac{11}{10}$ $\angle$ XPY = 47^0 44' or 47.73^0	K1 K1 N1
		Subtotal	3
5	(a)	Statement	P1
	(b)	Implication 1: If 5m – 4 < 16 then m < 4 Implication 2: If m < 4 then 5m – 4 < 16	P1 P1
	(c)	$5(n)^2 - n$, n = 1,2, 3, 4, …	K1 N1
		Subtotal	5

No		Answers	Marks
6	(a)	$m_{RS} = m_{PQ} = \frac{2-(-4)}{3-5}$ = -3 or equivalent	P1
		6 = -3*(7) + c or equivalent y = -3x + 27	K1 N1
	(b)	0 = -3x + 27 or equivalent x = 9	K1 N1
		Subtotal	5
7	(a)	k = 10 n = 2	P1 P1
	(b)	$\begin{pmatrix} 3 & -2 \\ -1 & 4 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -11 \\ 17 \end{pmatrix}$	P1
		$\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{3(4)-(-1)(-2)}\begin{pmatrix} 4 & 2 \\ 1 & 3 \end{pmatrix}\begin{pmatrix} -11 \\ 17 \end{pmatrix}$	K1
		x = -1 y = 4	N1 N1
		Subtotal	6
8		(a) $\frac{1}{2} \times \frac{22}{7}$ x 7 x 7 x 5 = 385	K1 N1
		(b) $\frac{1}{3} \times 14 \times 5 \times h$	K1
		$\frac{1}{2} \times \frac{22}{7}$ x 7 x 7 x 5 + $\frac{1}{3} \times 14 \times 5 \times h$ = 595	K1
		h = 9	N1
		Subtotal	5
9		Listing S = { (4, E), (4, D), (4, 3), (4, 7) (3, E), (3, D), (3, 4), (3, 7) (7, E), (7, D), (7, 3), (7, 4) (E, D), (E, 3), (E, 4), (E,7) (D, E), (D, 3), (D, 4), (D, 7)}	P2
	(a)	{(D, E), ((E, D)}	K1
		$\frac{2}{20} or \frac{1}{10}$	N1
	(b)	{ (3, E), (3, D), (3, 4), (3, 7), (7, D), (7, E), (7, 3), (7, 4), (4, D), (E, D)}	K1
		$\frac{10}{20} or \frac{1}{2}$	N1
		Subtotal	6

No		Answers	Marks
10	(a)	$\frac{210^0}{360^0}\times 2\times\frac{22}{7}\times 12$ or $\frac{60^0}{360^0}\times 2\times\frac{22}{7}\times 7$	K1
		$\frac{210^0}{360^0}\times 2\times\frac{22}{7}\times 12 + \frac{60^0}{360^0}\times 2\times\frac{22}{7}\times 7 + 12 + 7 + 5$	K1
		$\frac{226}{3}$ or $75\frac{1}{3}$ or 75.33 cm.	N1
	(b)	$\frac{210^0}{360^0}\times\frac{22}{7}\times 12\times 12$ or $\frac{60^0}{360^0}\times\frac{22}{7}\times 7\times 7$	K1
		$\frac{210^0}{360^0}\times\frac{22}{7}\times 12\times 12 - \frac{60^0}{360^0}\times\frac{22}{7}\times 7\times 7$	K1
		$\frac{715}{3}$ or $238\frac{1}{3}$ or 238.33 cm^2.	N1
		Subtotal	6
11	(a)	7	P1
	(b)	$\frac{7-u}{3}=2$	K1
		u = 1	N1
	(c)	$\frac{1}{2}\times(7+15)\times 8+\frac{1}{2}\times 15\times 4$	K1
		118	N1
		Subtotal	5
12	(a)	<table><tr><td>-4</td><td>1</td></tr><tr><td>22</td><td>-13</td></tr></table>	K1K1
	(b)	*Graph (Refer to the graph)* The axes drawn in the right direction with a uniform scale for $-4 \le x \le 3$.	P1
		7 points and *2 points plotted correctly or the curve passes through the 9 points in the range of $-4 \le x \le 3$. Note: If 8 or 7 points are plotted correctly, award K1. If 6 points or less are plotted correctly, award K0.	K2
		Smooth and continuous curve that passes through all the 8 points correctly without any straight segment in the range of $-4 \le x \le 3$.	N1
	(c)	(i) y = 7.5 ± 0.5	P1
		(ii) x = 1.5 ± 0.1 , –2.2 ± 0.1	P1

Graph for Question 12



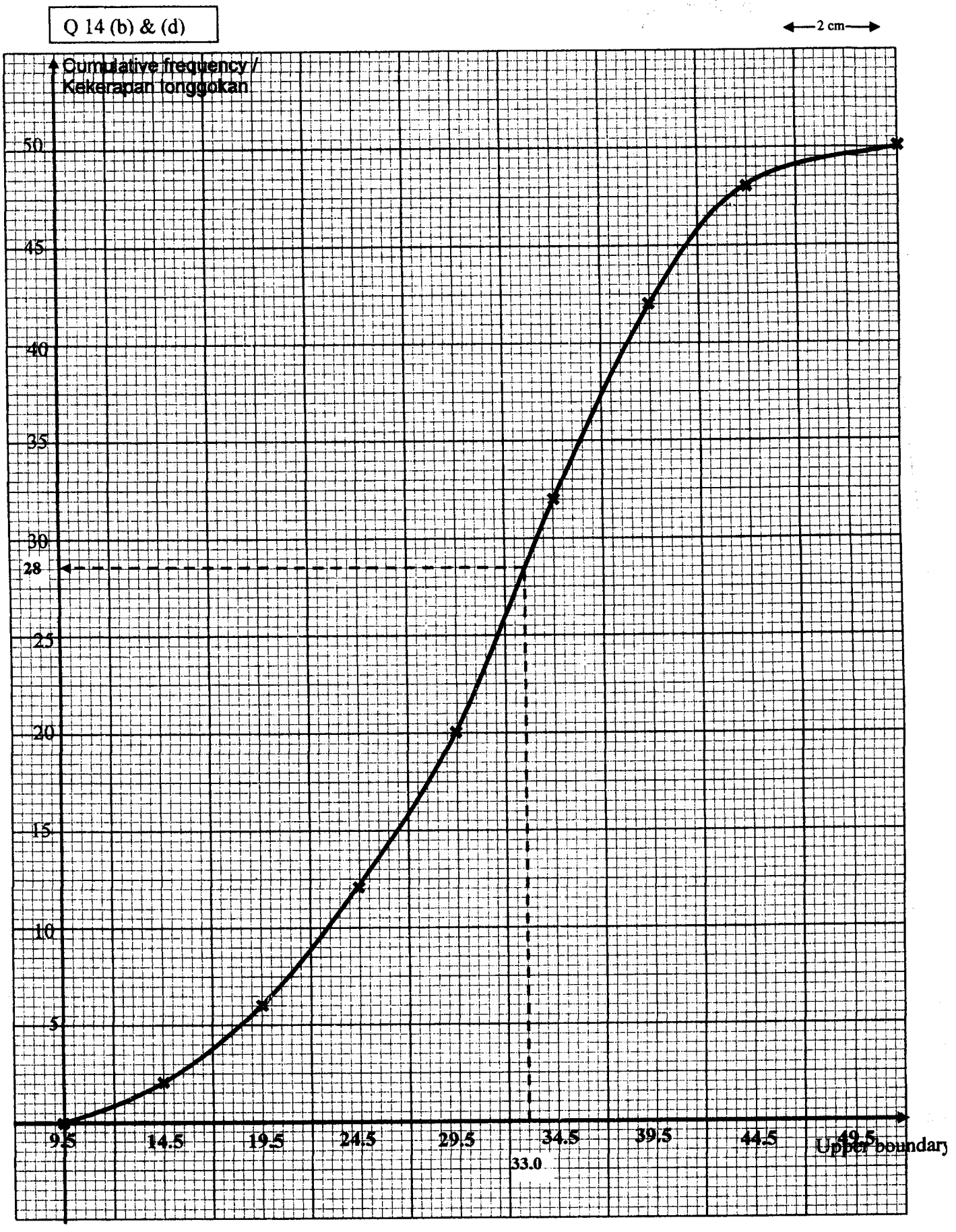
	(d)	y = -3x - 1 The straight line y = -3x - 1 drawn correctly. (Judgment : straight line that's passes 2 points marks correctly) Values of x = -3.4 ± 0.1 x = 1.7 ± 0.1	K1 K1 N1 N1
		Subtotal	12
13	(a)	i) (4,1)	P1
		ii) (a) (2,-1)	P1
		(b) (6,0)	P2
	(b)	Note : (-1, -3) get P1	
		i) V – Reflection in the line x = 2. (Note : Reflection award P1)	P2
		W – Enlargement with a scale factor of 2 at centre (6,5) (Note : (i) Enlargement at centre (6,5) or Enlargement with scale factor 2 award P2) (ii) Enlargement award P1)	P3
		ii) $\frac{128}{2^2}$	K1
		$128 - \frac{128}{2^2}$	K1
		$96\ m^2$	N1
		Subtotal	12
14	(a)		

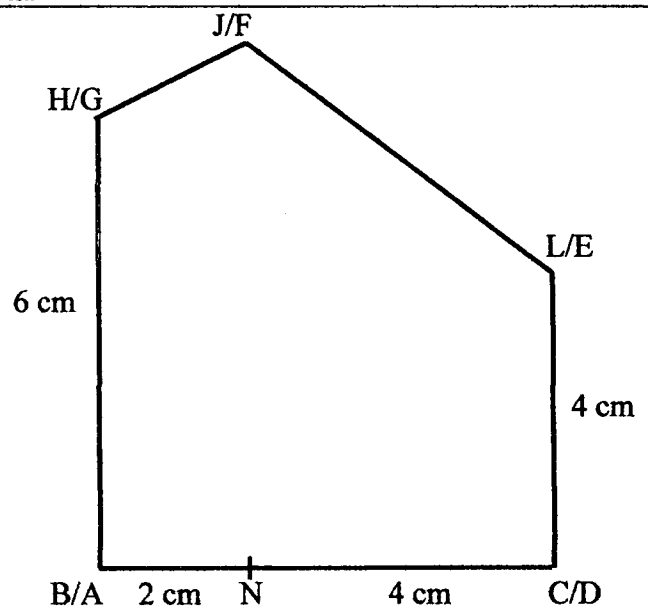
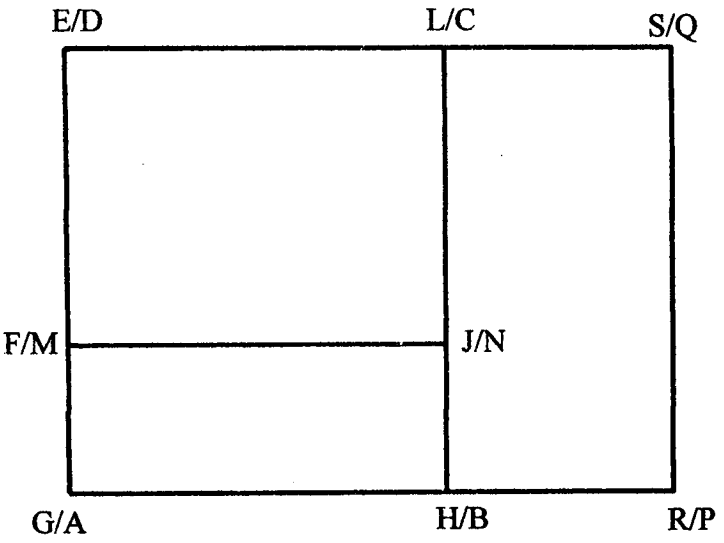
Frequency *Kekerapan*	Upper Boundary *Sempadan Atas*	Cumulative Frequency *Kekerapan Longgokan*
0	9.5	0
2	14.5	2
4	19.5	6
6	24.5	12
8	29.5	20
12	34.5	32
10	39.5	42
6	44.5	48
2	49.5	50

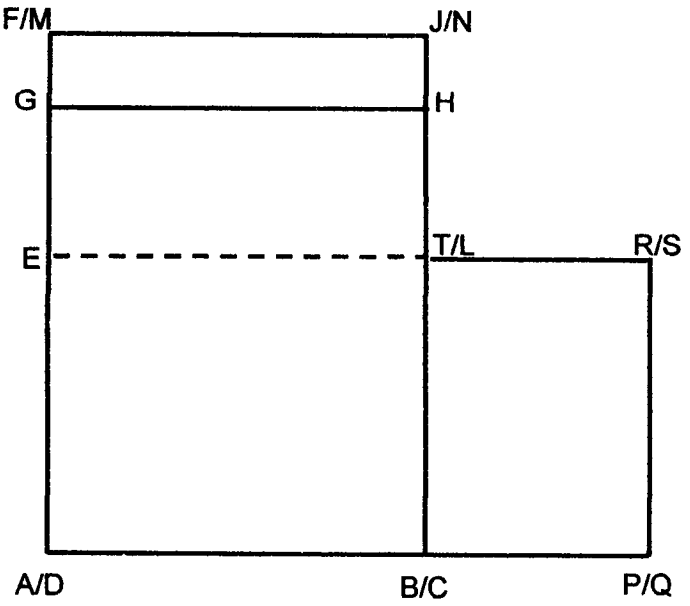
Table 14
Jadual 14

	Frequency Upper Boundary Cumulative frequency	P1 P1 P1
(b)	(i). Class Interval = 5	K1

Q 14 (b) & (d)



		(ii). Mean Age = $\frac{(12\times 2)+(17\times 4)+(22\times 6)+(27\times 8)+(32\times 12)+(37\times 10)+(42\times 6)+(47\times 2)}{50}$	K2
	(c)	= 30.8	N1
	(d)	Ogive (*Refer to the graph*) Correct labeling of the horizontal axis. All points correctly plotted. Note: If 8 or 7 points are plotted correctly, entitled K1 If 6 points or less are plotted correctly, assign K0 Smooth curve that passes through all the points 28 ± 1	P1 K2 N1 K1
		Subtotal	12
15	(a)		K1 Correct shape K1 HB=AC>CL=ND>BN, JL>JH N1 Accurate measurement
	(b)	(i) 	K1 Correct shape K1 AP=DQ>PQ=AD>AB=DC>AM=BN N2 (Accurate measurement)

		(ii) 	K1 (correct shape) Ignore dotted line EL) K1 (Dotted line EL) K1 AP>AF>AG>AB> BT=PR>BP=TR N2(Accurate measurement)
		Sub total	12
16	(a)	(i) 65°S (ii) (65°N, 80°E) Note : 80° or E award P1	P1P1 P1P2
	(b)	(65° + 65°) × 60 7800 n.m	K1 N1
	(c)	80 × 60 × cos 65° 2028.57 n.m Note : 80 or cos 65° award K1	K2 N1
	(d)	$\frac{(2028.57+7800)}{550}$ 17.87 hours or 17 hrs 52 min	K1 N1
		Subtotal	12