SULIT

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN PERCUBAAN (OTI 2) SIJIL PELAJARAN MALAYSIA 2011

1449/1

MATHEMATICS

Kertas 1
Ogos
2011

$1\frac{1}{4}$ jam

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
3. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Disediakan oleh:
AKRAM NEGERI TERENGGANU

Dibiayai oleh:
KERAJAAN NEGERI TERENGGANU

Dengan Kerjasama:
MPSM Negeri Terengganu

TERENGGANU NEGERI ANJUNG ILMU

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Kertas soalan ini mengandungi 32 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 piramid tegak $= \frac{1}{3} \times$ *luas tapak* $\times$ *tinggi*

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

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

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

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

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

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 Find the value of $(7 \div 1.03) \times 0.16$ and round off the answer correct to three significant figures.
Cari nilai $(7 \div 1.03) \times 0.16$ *dan bundarkan jawapan betul kepada tiga angka bererti.*

A 1.08
B 1.087
C 1.088
D 1.09

2 Express $1{\cdot}034 \times 10^{-5}$ as a single number
Ungkapkan $1{\cdot}034 \times 10^{-5}$ *sebagai satu nombor tunggal*

A 0·000 001 034
B 0·000 010 34
C 10 340
D 103 400

3 $0.0079 - 7.5 \times 10^{-4}$

A 4.00×10^{-4}
B 4.00×10^{-3}
C 7.15×10^{-4}
D 7.15×10^{-3}

4 The floor of a tennis court is a rectangle with 30 m width and 45 m length. Calculate the number of tiles required to cover the whole court if each tile is a square with sides of 30 cm.

Lantai sebuah gelanggang tenis ialah sebuah segiempat tepat berukuran 30 m *lebar dan* 45 m *panjang. Hitungkan bilangan jubin yang diperlukan untuk menutup seluruh gelanggang itu dengan jubin jika setiap jubin ialah segiempat sama dengan sisi* 30 cm.

A 1.5×10^{1}
B 1.5×10^{2}
C 1.5×10^{3}
D 1.5×10^{4}

5 State the value of the digit 4 in the number 2341_5 in base ten.
Nyatakan nilai bagi digit 4 dalam nombor 2341_5 *dalam asas sepuluh.*

A 16

B 20

C 40

D 75

6 Given that $11011_2 - X_2 = 1101_2$ then $X =$
Diberi bahawa $11011_2 - X_2 = 1101_2$ *maka* $X =$

A 1110_2

B 1101_2

C 1100_2

D 1001_2

7 In Diagram 1, *PQWTV* is a regular pentagon. *QRSW* is a parallelogram and *PQR* is a straight line.

Dalam Rajah 1, PQWTV ialah sebuah pentagon sekata. QRSW ialah sebuah segiempat selari dan PQR ialah garis lurus.

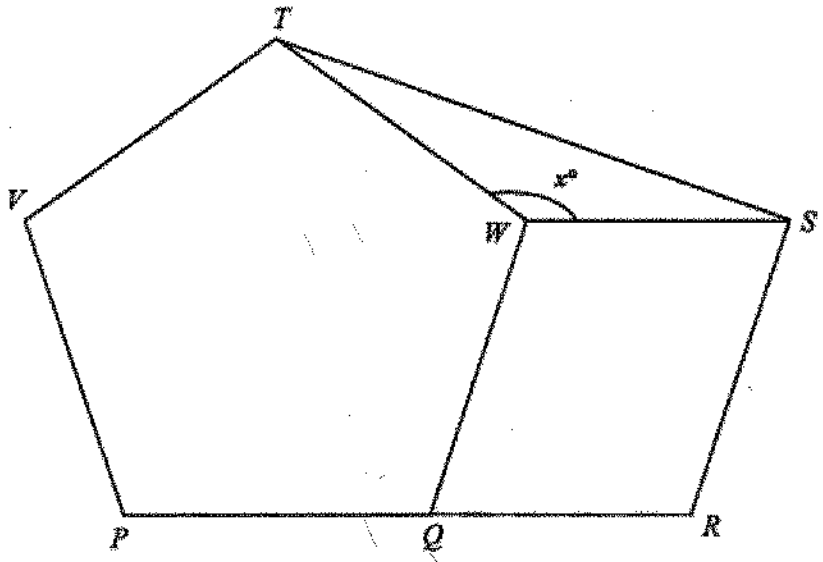


Diagram 1
Rajah 1

Find the value of x
Cari nilai x

A 108

B 120

C 144

D 162

8 In Diagram 2, *ABF* is an equilateral triangle and *AFE* is a straight line.

Dalam Rajah 2, ABF ialah segitiga sama sisi dan AFE ialah garis lurus.

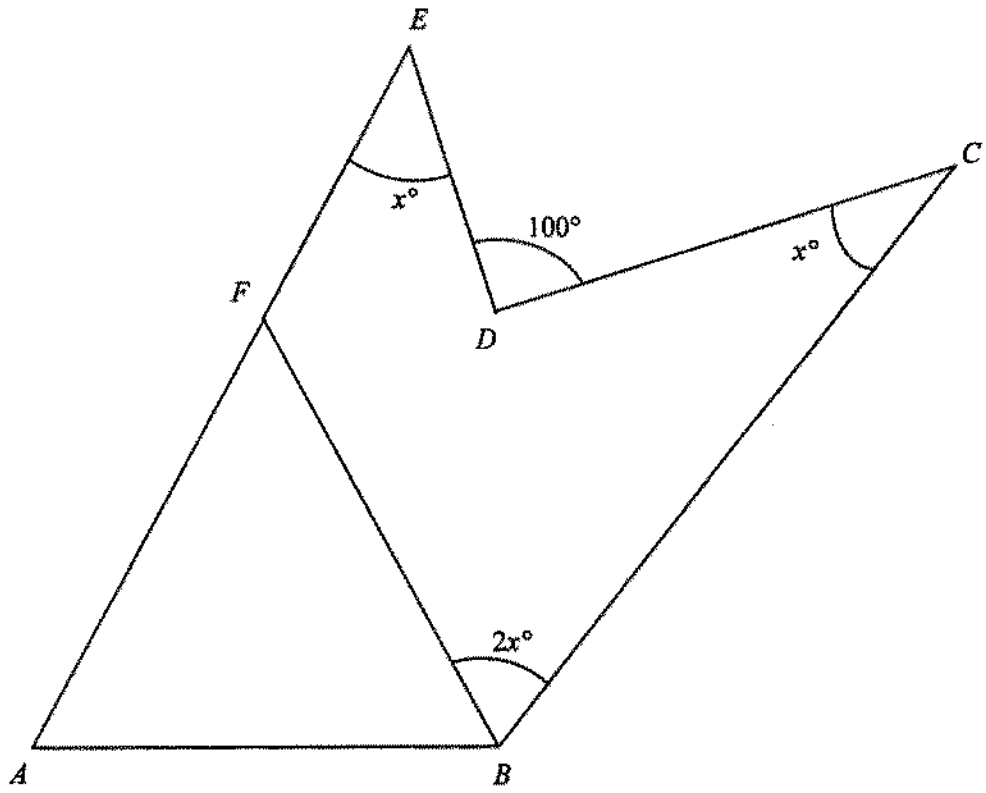


Diagram 2
Rajah 2

Find the value of x
Carikan nilai x

A 40

B 45

C 50

D 60

9 In Diagram 3, PQR is a tangent to the circle at the point Q. QST is an isosceles triangle.

Dalam Rajah 3, PQR ialah tangen kepada bulatan pada titik Q. QST ialah segitiga sama kaki.

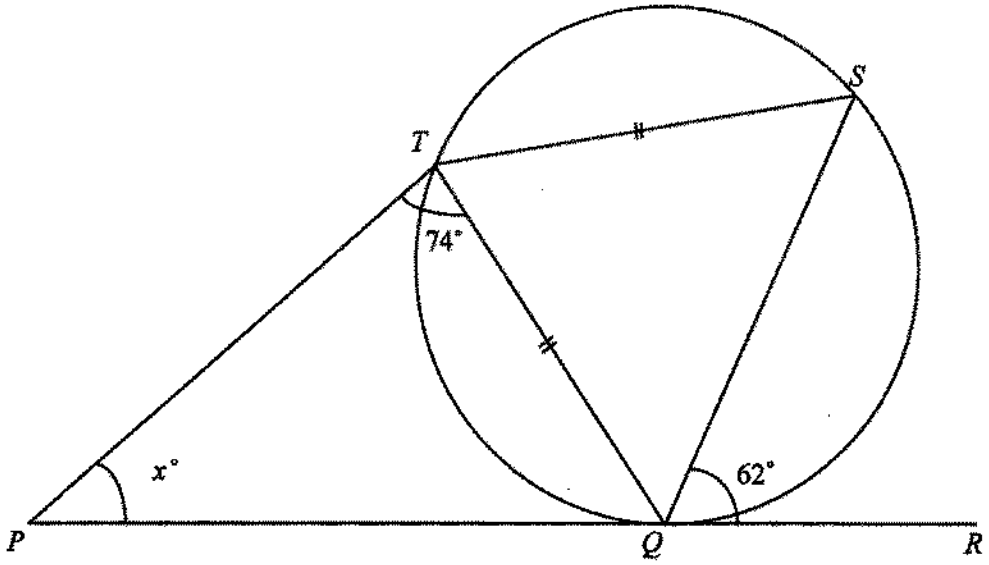


Diagram 3
Rajah 3

Find the value of x
Carikan nilai x

A 47

B 59

C 62

D 74

10 Diagram 4 shows two quadrilaterals, *P* and *Q*, drawn on square grids. *Q* is the image of *P* under an enlargement.

Rajah 4 menunjukkan dua buah sisiempat, P dan Q, dilukis pada grid segi empat sama. Q ialah imej bagi P di bawah suatu pembesaran.

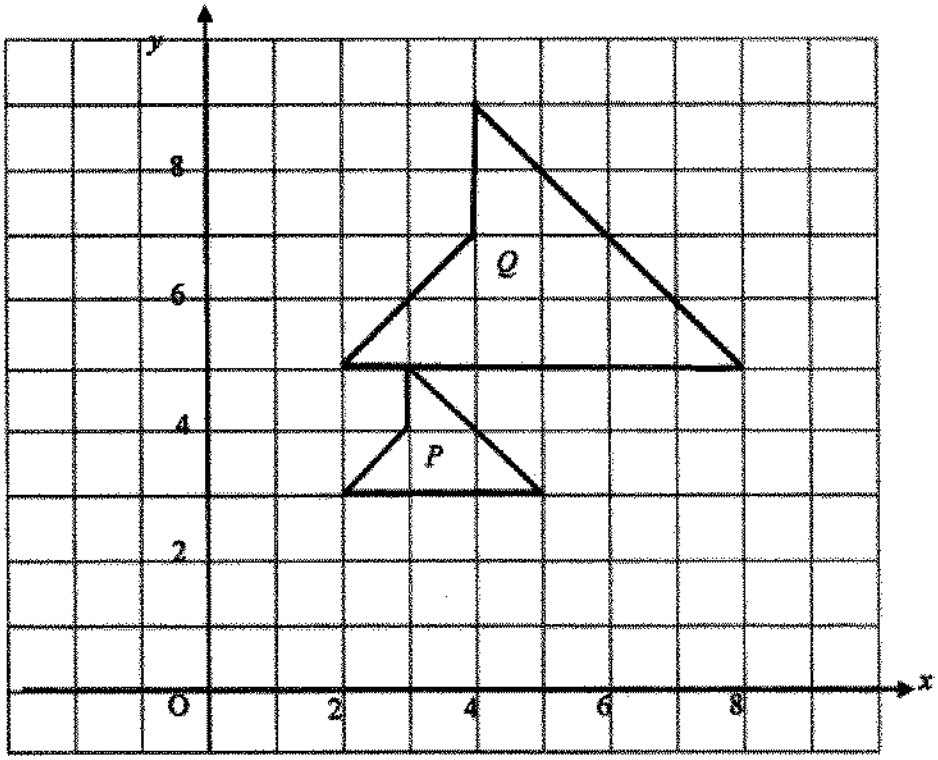


Diagram 4
Rajah 4

Find the centre and the scale factor of the enlargement.

Cari pusat dan faktor skala pembesaran itu.

	Centre of enlargement *Pusat Pembesaran*	Scale factor *Faktor skala*
A	(2, 1)	3
B	(2, 2)	2
C	(2, 1)	2
D	(2, 0)	2

11 Diagram 5 shows five triangles *P*, **A**, **B**, **C** and **D** drawn on square grids.

Rajah 5 menunjukkan lima buah segitiga P, **A**, **B**, **C** *dan* **D** *dilukis pada grid segiempat sama.*

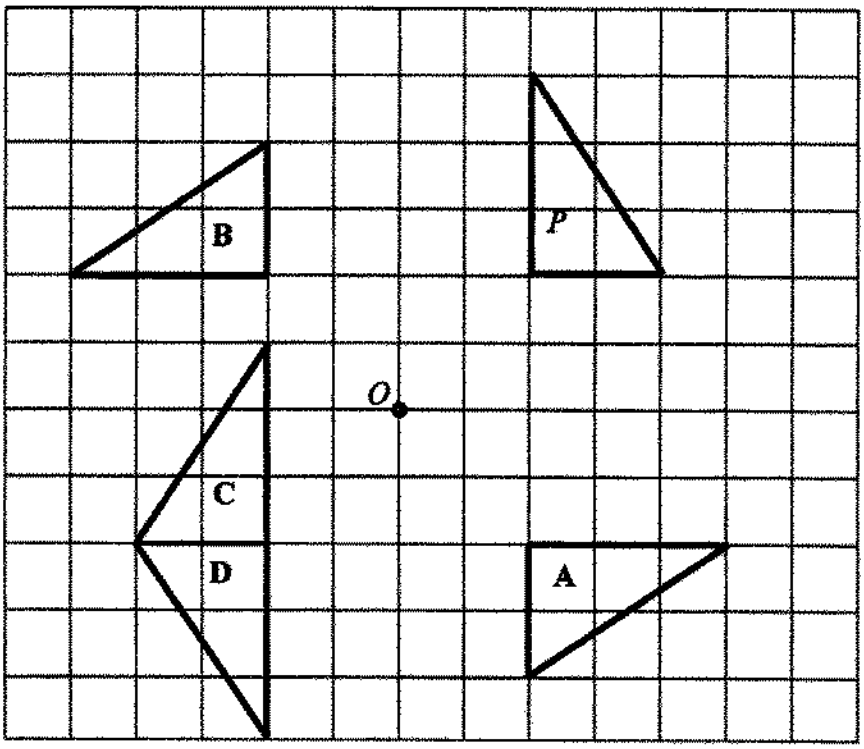


Diagram 5
Rajah 5

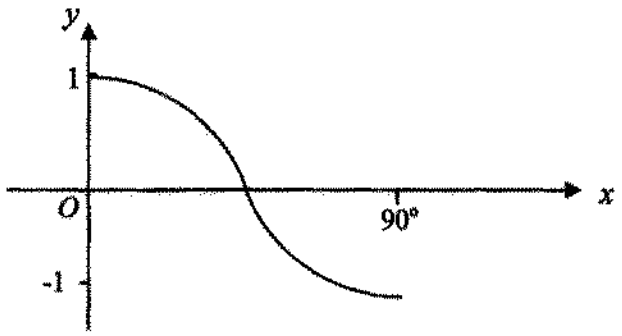
Among the triangles **A**, **B**, **C** and **D**, which is the image of triangle *P* under the rotation of 180° about the centre *O*.

Antara segitiga **A**, **B**, **C** *dan* **D**, *yang manakah merupakan imej bagi segitiga P di bawah putaran* 180° *pada pusat O.*

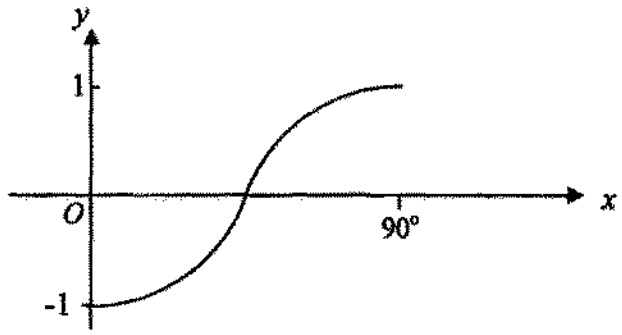
12 Which of the graphs represents part of the graph $y = \cos x°$.

Graf manakah yang mewakili sebahagian daripada graf $y = kos\ x°$.

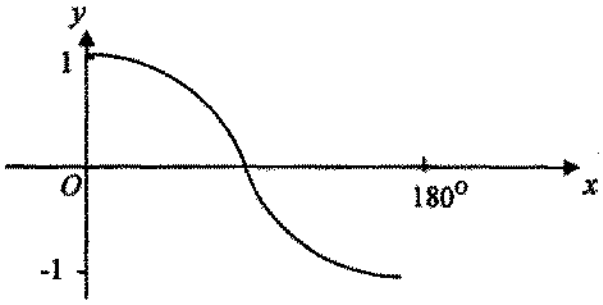
A



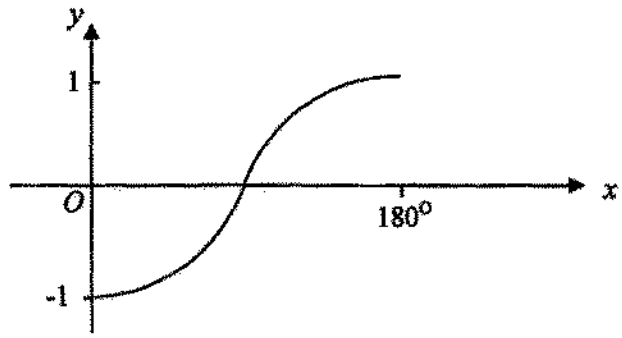
B



C



D



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

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

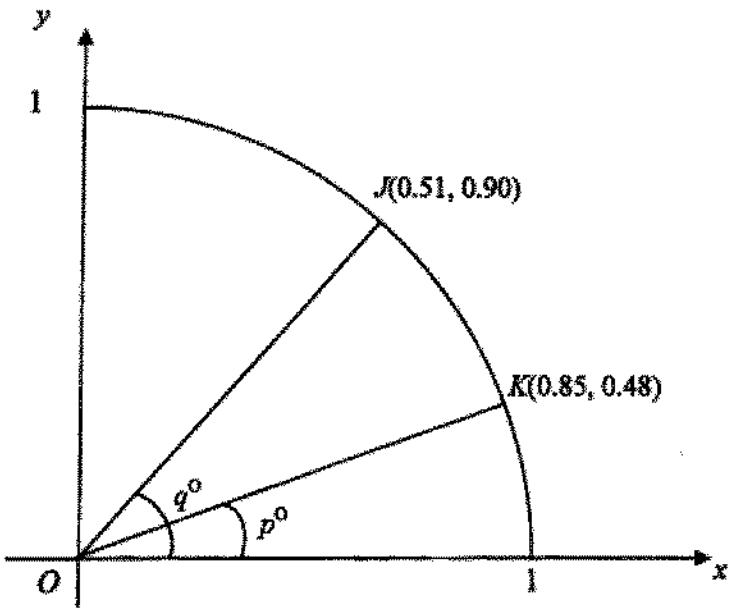


Diagram 6
Rajah 6

Find the value of $\sin q° + \cos p°$

Cari nilai $\sin q° + \cos p°$

A 1.75

B 1.38

C 1.26

D 0.99

14 Diagram 7 shows a right prism *JKLMNO* with a rectangular base *JKLM*. Isosceles triangle *OJK* is the uniform cross section of the prism. *P* and *Q* are midpoints of the lines *JK* and *LM* respectively.

Rajah 7 menunjukkan sebuah prisma tegak JKLMNO dengan tapak segi empat tepat JKLM. Segitiga sama kaki OJK adalah keratan rentas seragam prisma itu. P dan Q adalah masing-masing titik tengah bagi garis JK dan LM.

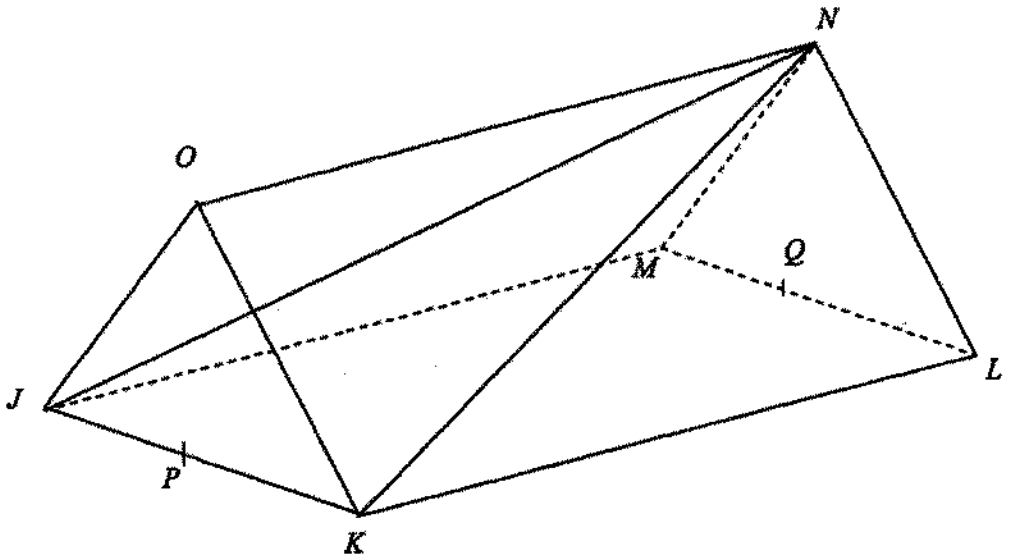


Diagram 7
Rajah 7

Name the angle between the plane *JKLM* and the plane *JKN*.

Namakan sudut di antara satah JKLM dengan satah JKN.

A $\angle NJL$

B $\angle NPQ$

C $\angle NJQ$

D $\angle NJM$

15 Diagram 8 shows a building *PQ*, *R* is a point on the horizontal ground. The height of the building is 80 m.

Rajah 8 menunjukkan sebuah bangunan PQ, R ialah titik pada satah mengufuk. Tinggi bangunan itu ialah 80 m.

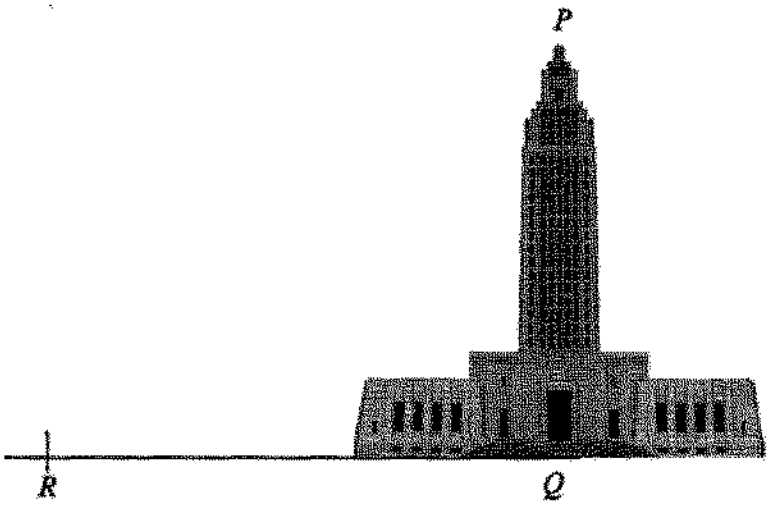


Diagram 8
Rajah 8

The angle of elevation of *P* from *R* is 40^0. Calculate the distance, in m, of the building *PQ* from point *R*.

Sudut dongakan P dari R ialah 40^0. *Hitungkan jarak, dalam* m, *bangunan PQ dari titik R.*

A 124.46

B 104.43

C 95.34

D 67.13

16 Diagram 9 shows a pole *JK*. *K*, *L* and *M* are lie on a horizontal plane.

Rajah 9 menunjukkan sebatang tiang JK. K, L dan M terletak di atas satah mengufuk.

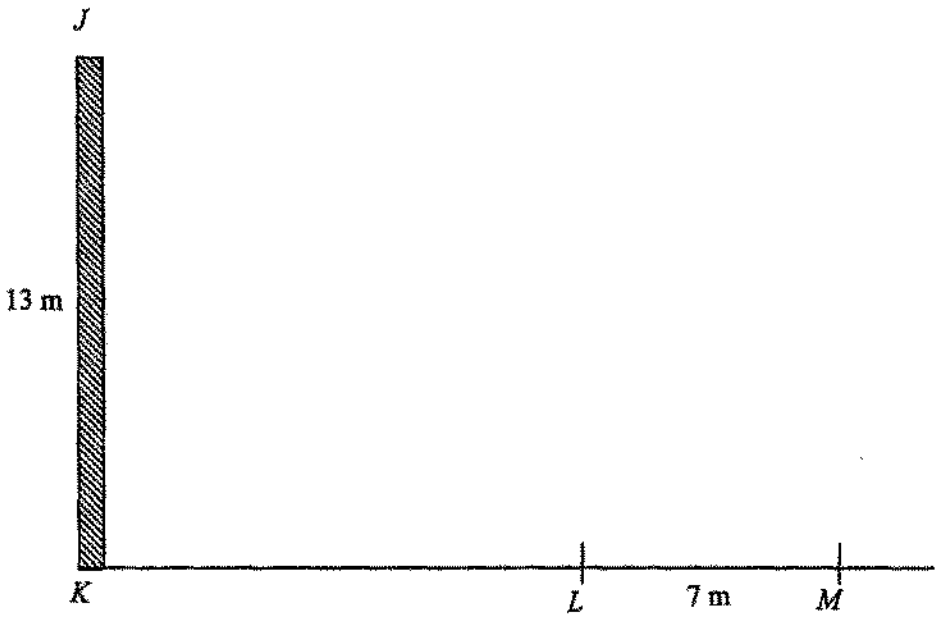


Diagram 9
Rajah 9

Given that the angle of depression of *L* from *J* is 42°. Find the angle of elevation of *J* from *M*.

Diberi bahawa sudut tunduk L dari J ialah 42°. Cari sudut dongakan J dari M.

A 29°23′

B 31°14′

C 47°59′

D 58°45′

17 Diagram 10 shows three points P, Q and R on a horizontal plane.

Rajah 10 menunjukkan tiga titik P, Q dan R pada satah mengufuk.

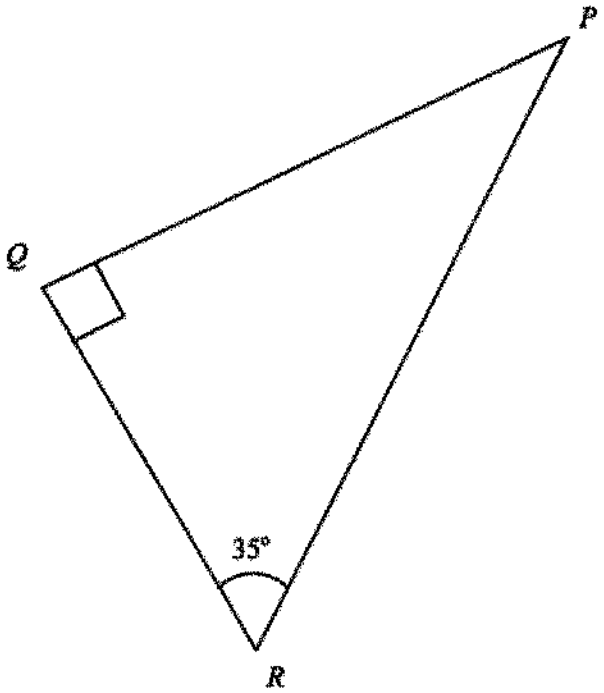


Diagram 10
Rajah 10

It is given that Q lies due west of R. Find the bearing of P from R.

Diberi Q berada ke barat R. Cari bearing P dari R.

A 125°

B 145°

C 215°

D 305°

18 In Diagram 11, *N* is the North Pole and *S* is the South Pole. *NOS* is the axis of the earth and *PQ* is the diameter of the parallel of latitude.

Dalam Rajah 11 , *U ialah Kutub Utara dan S ialah Kutub Selatan. UOS ialah paksi bumi dan PQ ialah diameter selarian latitud.*

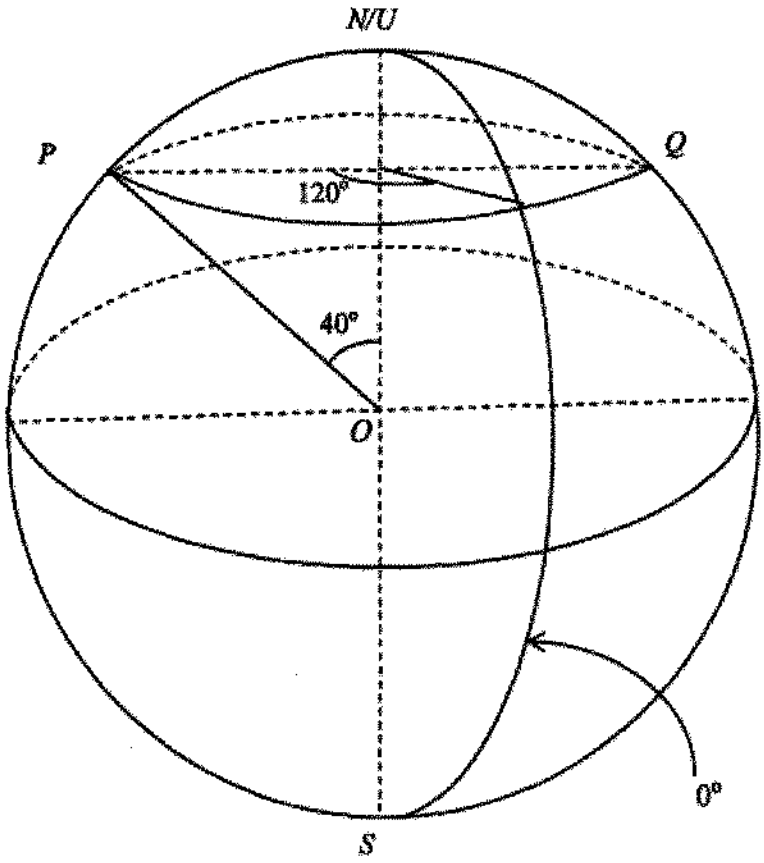


Diagram 11
Rajah 11

Find the location of point *Q*.
Cari kedudukan titik Q.

A (40°*N*, 120°*E*)
(40°*U*, 120°*T*)

B (40°*N*, 60°*E*)
(40°*U*, 60°*T*)

C (50°*N*, 60°*E*)
(50°*U*, 60°*T*)

D (50°*N*, 120°*E*)
(50°*U*, 120°*T*)

19 $2p(p-3)+(2-p)^2$

A $3p^2-10p+4$

B $3p^2+10p+4$

C $3p^2+2p-4$

D $3p^2-2p-4$

20 Express $\frac{2}{3p}-\frac{3p-1}{4}$, as a single fraction in its simplest form.

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

A $\frac{9p^2+3p+8}{12p}$

B $\frac{-9p^2-3p+8}{12p}$

C $\frac{9p^2-3p+8}{12p}$

D $\frac{-9p^2+3p+8}{12p}$

21 Given that $\frac{5}{3m}-\frac{n}{m}=3n$, express m in terms of n.

Diberi bahawa $\frac{5}{3m}-\frac{n}{m}=3n$, *ungkapkan m dalam sebutan n.*

A $m=\frac{9n}{5-3n}$

B $m=\frac{5-3n}{9n}$

C $m=\frac{9}{3n-5}$

D $m=\frac{3n-5}{9}$

22 Given that $1-\frac{2x}{3}=6-2(3-x)$, find the value of x.

Diberi bahawa $1-\frac{2x}{3}=6-2(3-x)$, *cari nilai* x.

A $-\frac{3}{8}$

B $-\frac{8}{3}$

C $\frac{3}{8}$

D $\frac{8}{3}$

23 Given that $\left(\frac{1}{9}\right)^n \times 27 = 3$, find the value of n.

Diberi bahawa $\left(\frac{1}{9}\right)^n \times 27 = 3$, *cari nilai* n.

A 1

B 2

C -1

D -2

24 Simplify $(3x^{-3}y)^2 \times \frac{1}{3}x^3y^{-1}$.

Ringkaskan $(3x^{-3}y)^2 \times \frac{1}{3}x^3y^{-1}$.

A $x^{-3}y$

B x^3y

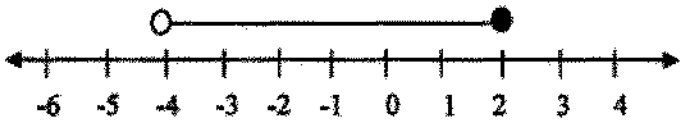
C $3x^{-3}y$

D $3x^3y$

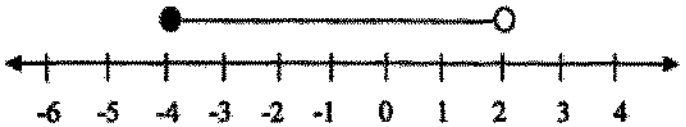
25 Which number line represents the solutions of the simultaneous linear inequalities $3(k-1) \leq k+1$ and $\frac{3k}{4} - k < 1$?

Garis nombor manakah yang mewakili penyelesaian bagi ketaksamaan linear serentak $3(k-1) \leq k+1$ *dan* $\frac{3k}{4} - k < 1$?

A



B



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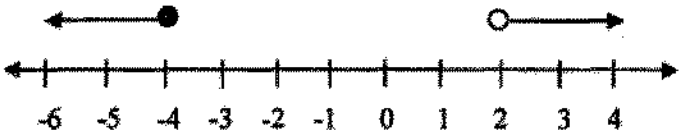
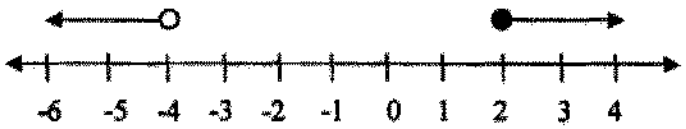


D



26 In Diagram 12, the pie chart shows the amount of sale of bus tickets for four months.

Dalam Rajah 12, *carta pai menunjukkan jumlah jualan tiket bas untuk empat bulan.*

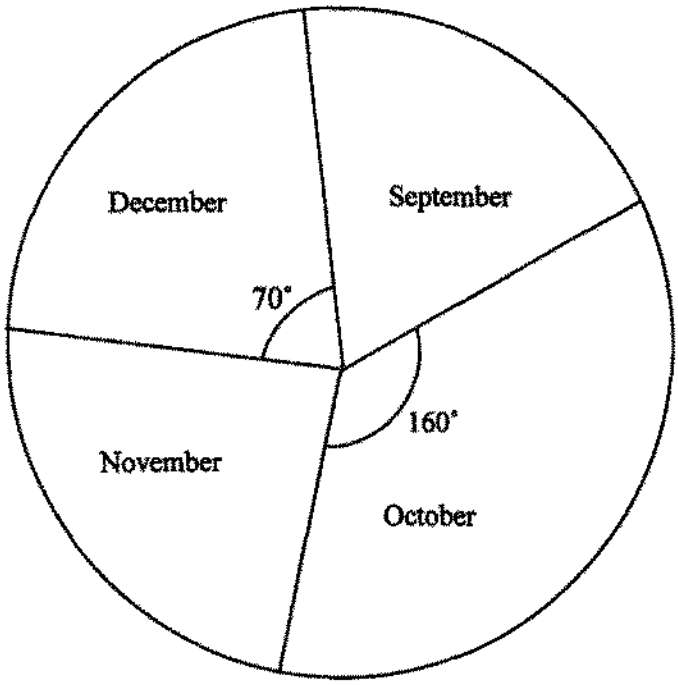


Diagram 12
Rajah 12

The total sale is RM 9 000. Calculate the amount, in RM, of sales in September and November.

Jumlah jualan ialah RM 9 000. *Hitung jumlah jualan, dalam* RM, *bagi bulan September dan November.*

A 2 600

B 2 860

C 2 900

D 3 250

27 Table 1 shows the marks obtained by a group of students in a Mathematics quiz.

Jadual 1 menunjukkan markah yang diperolehi oleh sekumpulan pelajar dalam kuiz Matematik.

Marks *Markah*	20	30	40	50	60
Number of students *Bilangan pelajar*	18	x	12	13	15

Table 1
Jadual 1

If the total number of students is 65 , find the mean.

Jika jumlah pelajar adalah 65, cari min.

A 6

B 18

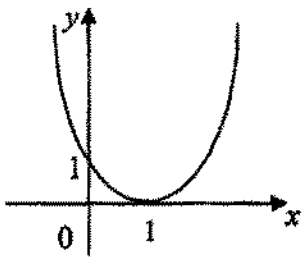
C 40

D 58

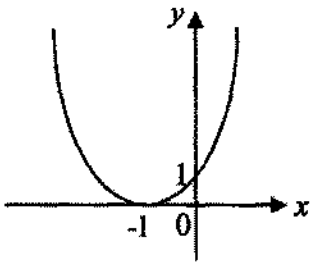
28 Which graph represents $y = -(x+1)^2$?

Graf yang manakah mewakili $y = -(x+1)^2$?

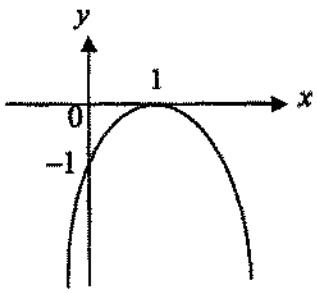
A



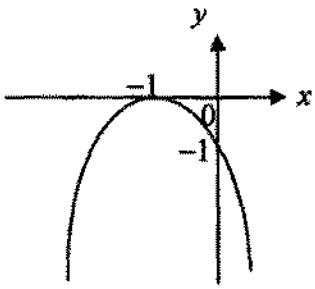
B



C



D



29 Diagram 13 is a Venn diagram showing the number of elements of the univesal set ξ, set P and set Q.

Rajah 13 *ialah gambar rajah Venn yang menunjukkan bilangan unsur bagi set semesta* ξ, *set* P *dan set* Q.

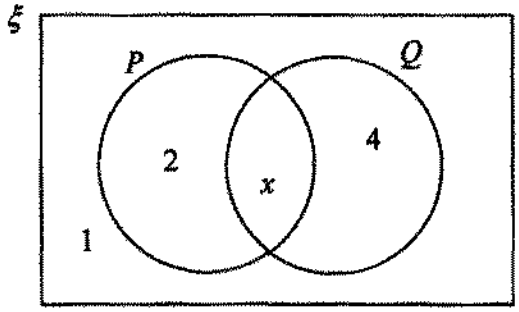


Diagram 13
Rajah 13

Given that $n(Q) = n(P \cap Q)'$
Find the value of x.

Diberi bahawa $n(Q) = n(P \cap Q)'$
Cari nilai x

A 2
B 3
C 4
D 5

30 It is given that the universal set $\xi = \{ x : 2 \le x \le 20, x \text{ is an integer} \}$,
set $P = \{ x : x \text{ is a factor of } 24 \}$ and set $Q = \{ x : x \text{ is a prime number} \}$.
Find $n(P' \cap Q)$

Diberi bahawa set semesta $\xi = \{ x : 2 \le x \le 20, x$ *ialah integer* $\}$,
set $P = \{ x : x$ *ialah faktor bagi* $24 \}$ *dan set* $Q = \{ x : x$ *ialah nombor perdana* $\}$.
Cari $n(P' \cap Q)$

A 4
B 5
C 6
D 7

31 Diagram 14 is a Venn diagram which shows set X, set Y and set Z.
The area which represents the set $(X \cap Y)' \cap Z'$ is
Rajah 14 *ialah gambar rajah Venn yang menunjukkan set X, set Y dan set Z.*
Kawasan yang mewakili set $(X \cap Y)' \cap Z'$ *adalah*

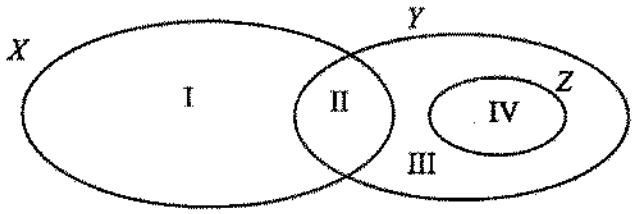


Diagram 14
Rajah 14

A II, IV

B II, III

C I, II

D I, III

32 In Diagram 15, PR is a straight line with the equation of $3x + 8y = 15$.
Dalam Rajah 15, PR *ialah garis lurus dengan persamaan* $3x + 8y = 15$.

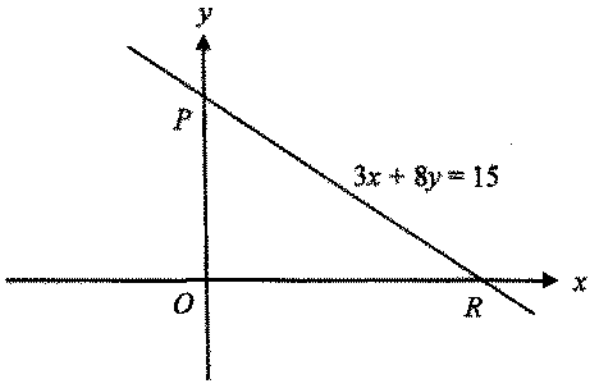


Diagram 15
Rajah 15

Find the x-intercept of straight line PR.
Cari pintasan-x bagi garis lurus PR.

A $\frac{15}{8}$

B 5

C (5, 0)

D $(0, \frac{15}{8})$

33 In Diagram 16, *MN* is a straight line.
Dalam Rajah 16, MN ialah garis lurus.

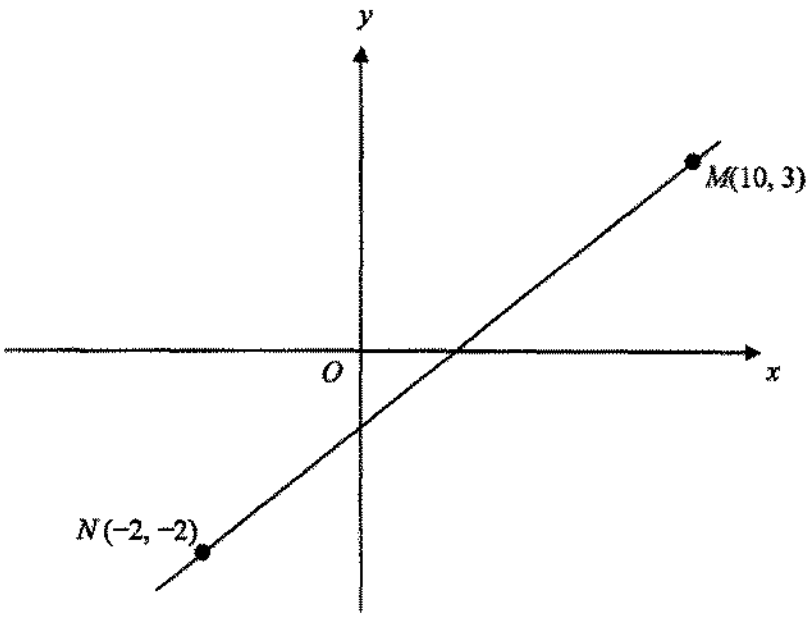


Diagram 16
Rajah 16

The gradient of straight line *MN* is
Kecerunan garis lurus MN ialah

A $\frac{12}{5}$

B $\frac{5}{12}$

C $\frac{7}{12}$

D $\frac{1}{8}$

34 There are 20 science books, some sports and fictions books on a book rack. If a book is chosen at random from the book rack, the probability of choosing a science book is $\frac{2}{7}$ and the probability of choosing a sports book is $\frac{1}{7}$. Find the total number of books on the book rack.

Terdapat 20 buah buku sains, beberapa buah buku sukan dan fiksyen atas suatu rak buku. Jika sebuah buku dipilih secara rawak daripada rak buku tersebut, kebarangkalian memilih buku sains ialah $\frac{2}{7}$ dan *kebarangkalian memilih buku sukan ialah* $\frac{1}{7}$. *Cari jumlah buku atas rak buku tersebut.*

A 20
B 40
C 70
D 140

35 A factory produced 800 bulbs a day. The probability that a bulb produced is not in good condition is $\frac{3}{400}$. From a production of 16 000 bulbs, find the number of bulbs that are expected to be not in good condition.

Sebuah kilang menghasilkan 800 unit mentol sehari. Kebarangkalian bahawa sebuah mentol yang dihasilkan itu rosak ialah $\frac{3}{400}$. *Daripada pengeluaran 16 000 mentol, cari bilangan mentol yang dijangkakan rosak.*

A 3
B 6
C 120
D 8 000

36 The relation between J, X and Y is $J \propto X^m Y^n$ where m and n are integers. If J varies directly as the square of X and varies inversely as the cube of Y, state the value of m and n.

Hubungan antara J, X dan Y ialah $J \propto X^m Y^n$ dengan m dan n ialah integer. Jika J berubah secara langsung mengikut kuasa dua X dan secara songsang mengikut kuasa tiga Y, nyatakan nilai m dan n.

A $m = 2, n = -3$

B $m = 2, n = 3$

C $m = -3, n = 2$

D $m = 3, n = 2$

37 Given that Q varies directly as the square of u and varies inversely as w and $Q = 18$ when $u = 3$ and $w = 4$.
Express Q in terms of u and w.

Diberi bahawa Q berubah secara langsung dengan kuasa dua u dan berubah secara songsang dengan w dan $Q = 18$ apabila $u = 3$ dan $w = 4$.
Ungkapkan Q dalam sebutan u dan w.

A $Q = \frac{8u^2}{w}$

B $Q = \frac{u^2}{8w}$

C $Q = \frac{12u^2}{w}$

D $Q = \frac{u^2}{12w}$

38 Table 2 shows the values of u, V and W which satisfy $u \propto \frac{\sqrt{V}}{W}$.
Find the value of h.

Jadual 2 menunjukkan nilai-nilai u, V dan W yang memuaskan $u \propto \frac{\sqrt{V}}{W}$.
Cari nilai h

u	5	h
V	81	100
W	3	4

Table 2
Jadual 2

A $\frac{5}{3}$

B $\frac{25}{6}$

C 15

D $\frac{75}{2}$

39 Given $\begin{pmatrix} 4 & p \\ 2 & 0 \end{pmatrix}\begin{pmatrix} p \\ 3 \end{pmatrix} = \begin{pmatrix} -28 \\ -8 \end{pmatrix}$. Find the value of p.

Diberi $\begin{pmatrix} 4 & p \\ 2 & 0 \end{pmatrix}\begin{pmatrix} p \\ 3 \end{pmatrix} = \begin{pmatrix} -28 \\ -8 \end{pmatrix}$. *Cari nilai p.*

A $p = -32$

B $p = -7$

C $p = -4$

D $p = 2$

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

A $\begin{pmatrix} 6 & 0 \\ -1 & -2 \end{pmatrix}$

B $\begin{pmatrix} 9 & -5 \\ 6 & -3 \end{pmatrix}$

C $\begin{pmatrix} 6 & 4 \\ -1 & -3 \end{pmatrix}$

D $\begin{pmatrix} 9 & -5 \\ -1 & -1 \end{pmatrix}$

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

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

2. Answer **all** questions.
   Jawab **semua** *soalan.*

3. Each question is followed by four alternative answers, **A**, **B**, **C** or **D**. For each question, choose **one** answer only. Blacken your answer on the objective answer sheet provided.
   Tiap-tiap soalan diikuti oleh empat pilihan jawapan, iaitu **A**, **B**, **C** dan **D**. *Bagi setiap soalan, pilih* **satu** *jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.*

4. 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 4.
   Satu senarai rumus disediakan di halaman 2 *hingga* 4.

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 diprogram.

SULIT

NAMA

Tingkatan

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN PERCUBAAN (OTI 2) 1449/2

SIJIL PELAJARAN MALAYSIA 2011

MATHEMATICS
Kertas 2
Ogos 2011

$2\frac{1}{2}$ jam **Dua jam tiga puluh minit**

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tuliskan* **nama** *dan* **tingkatan** *anda 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 Inggeris atau Bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

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

Disediakan oleh:
AKRAM NEGERI TERENGGANU

Dibiayai oleh:
KERAJAAN NEGERI TERENGGANU

Dengan Kerjasama:
MPSM Negeri Terengganu

TERENGGANU NEGERI ANJUNG ILMU

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

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

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

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

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

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

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*

For Examiner's Use

Section A / *Bahagian A*

[52 marks / 52 *markah*]

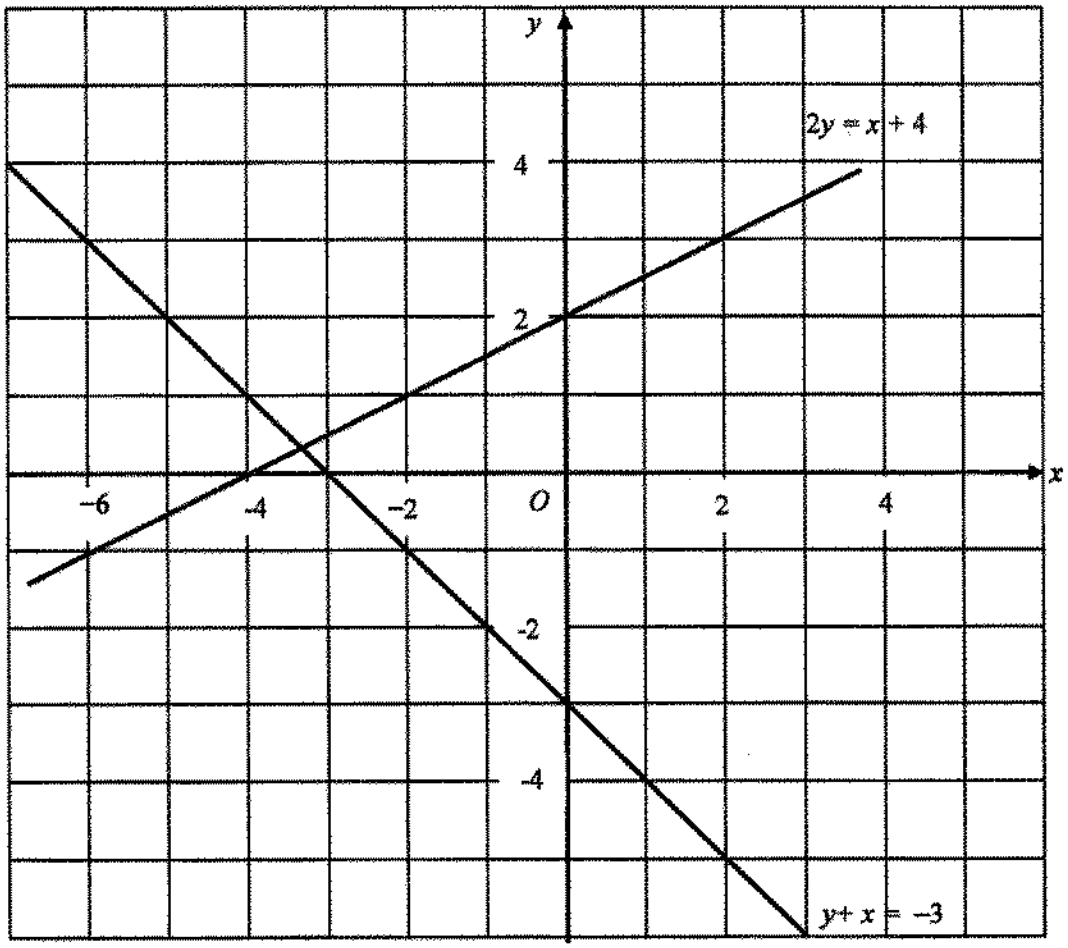
Answer **all** questions in this section. / *Jawab* **semua** *soalan dalam bahagian ini.*

1 On the graph in the answer space, shade the region which satisfy the three inequalities $2y \geq x + 4$, $y + x \geq -3$ and $y < 3$.

Pada graf yang disediakan di ruangan jawapan, lorekkan rantau yang memuaskan ketiga-tiga ketaksamaan $2y \geq x + 4$, $y + x \geq -3$ dan $y < 3$.

[3 *marks* / 3 *markah*]

Answer / *Jawapan* :



For Examiner's Use

2 Calculate the value of x and of y that satisfy the following simultaneous linear equations :

Hitungkan nilai x dan nilai y yang memuaskan persamaan linear serentak berikut :

$$5x + \frac{3}{4}y = 12$$
$$2x - 3y = 18$$

[4 *marks* / 4 *markah*]

Answer / *Jawapan* :

3 Solve the following quadratic equation:

Selesaikan persamaan kuadratik berikut:

$$x - 4 = \frac{4 - x}{3x}$$

[4 *marks* / 4 *markah*]

Answer / *Jawapan* :

4 Diagram 4 shows a solid right prism with regular hexagon *MNOPQR* as the uniform cross-section. A hemisphere is removed from this solid.

Rajah 4 menunjukkan sebuah pepejal berbentuk prisma tegak dengan heksagon sekata MNOPQR sebagai keratan rentas seragamnya. Sebuah hemisfera dikeluarkan daripada prisma itu.

For Examiner's Use

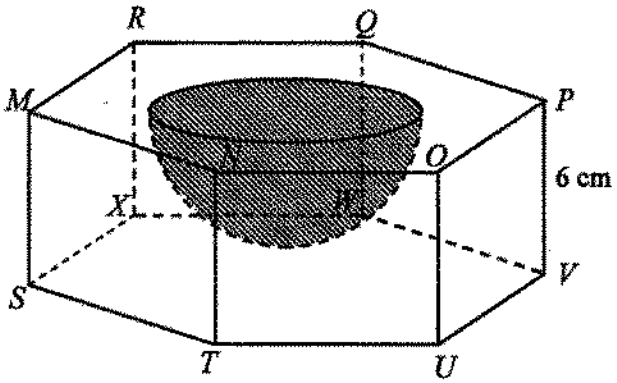


Diagram 4 / *Rajah* 4

The area of the cross-section of the prism is 30 cm^2 and the diameter of the hemisphere is 7 cm.

Luas keratan rentas seragam prisma itu ialah 30 cm^2 *dan diameter hemisfera ialah* 7 cm.

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

Hitungkan isipadu, dalam cm^3, *pepejal yang tinggal.*

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

[4 *marks* / 4 *markah*]

Answer / *Jawapan* :

For Examiner's Use

5 (a) Write the converse of the following statement. Hence, state whether the converse is true of false.

Tuliskan akas bagi pernyataan ini. Seterusnya nyatakan sama ada akas itu benar atau palsu.

If n is an odd integer, then $(n + 1)$ is an even integer

Jika n ialah integer ganjil, maka $(n + 1)$ *ialah integer genap.*

(b) Write two implications from the following sentence:

Tuliskan dua implikasi daripada ayat berikut:

$\frac{m}{n}$ is a proper fraction if and only if m and n are integers with $0 < m < n$

$\frac{m}{n}$ *ialah satu pecahan wajar jika dan hanya jika m dan n adalah integer dengan* $0 < m < n$

(c) Make a general conclusion by induction for a list of numbers 1, 13, 33, 61, ... Which follows the following pattern :

Buat satu kesimpulan umum secara aruhan bagi bagi senarai nombor 1, 13, 33, 61, ... *yang mengikut pola berikut:*

$$1 = 4(1)^2 - 3$$
$$13 = 4(2)^2 - 3$$
$$33 = 4(3)^2 - 3$$
$$61 = 4(4)^2 - 3$$

[6 *marks* / 6 *markah*]

Answer/ *Jawapan*:

(a) .....

.....

(b) Implication 1/ *Implikasi* 1:.....

.....

Implication 2/ *Implikasi* 2:.....

.....

(b) .....

.....

6 In Diagram 6, O is the origin. Straight line PQ is parallel to straight line RS.
Dalam Rajah 6, O ialah asalan. Garis lurus PQ adalah selari dengan garis lurus RS.

For Examiner's Use

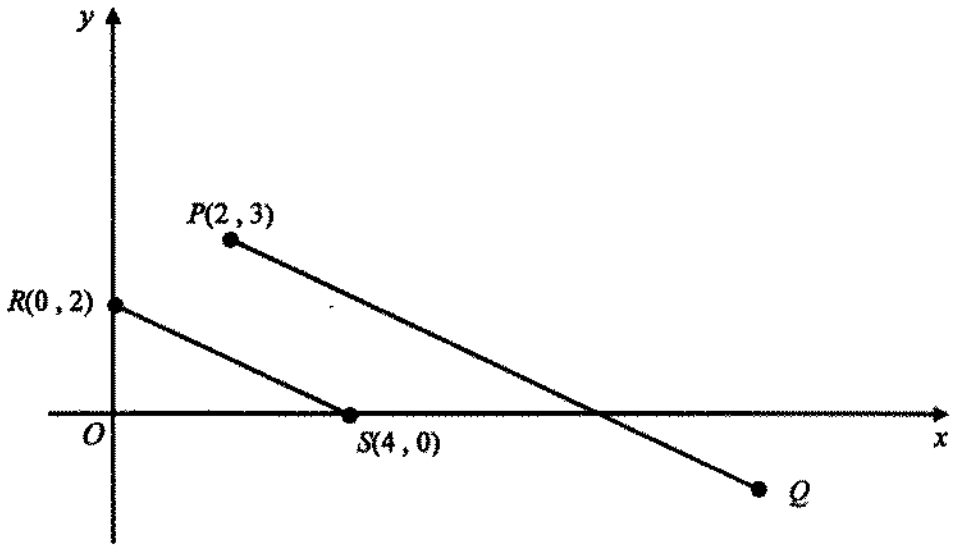


Diagram 6 / *Rajah* 6

Find
Cari

(a) the equation of the straight line PQ,
persamaan garis lurus PQ.

(b) the x – intercept of the straight line PQ.
pintasan – x bagi garis lurus PQ.

[5 *marks* /5 *markah*]

Answer / *Jawapan* :

(a)

(b)

For Examiner's Use

7 Diagram 7 shows sector *OPQ* and quadrant *ORS*, with common centre *O*. *OPR is a* straight line.

Rajah 7 menunjukkan sektor OPQ dan sukuan bulatan ORS, dengan pusat sepunya O. OPR ialah garis lurus.

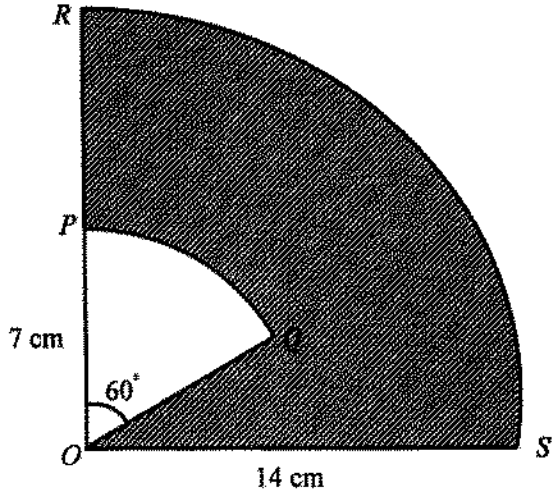


Diagram 7 / *Rajah 7*

Use $\pi = \frac{22}{7}$ and give the answers correct to two decimal places.

Calculate

Guna $\pi = \frac{22}{7}$ *dan beri jawapan betul kepada dua tempat perpuluhan.*

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

8 (a) Given that matrix $p\begin{pmatrix} 3 & t \\ 4 & 2 \end{pmatrix}$ is the inverse matrix of $\begin{pmatrix} 2 & -1 \\ -4 & 3 \end{pmatrix}$. Find the value of *p and t.*

Diberi matriks $p\begin{pmatrix} 3 & t \\ 4 & 2 \end{pmatrix}$ *adalah matriks songsang bagi* $\begin{pmatrix} 2 & -1 \\ -4 & 3 \end{pmatrix}$. *Cari nilai p dan t.*

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

Tulis persamaan serentak berikut dalam bentuk persamaan matriks:

$$2x - y = -3$$
$$-4x + 3y = 5$$

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

9 Diagram 9 shows the speed-time graph for the movement of a cyclist in a competition for the period of 8 seconds.

Rajah 9 menunjukkan graf laju-masa bagi pergerakan seorang pelumba basikal dalam pertandingan bagi tempoh 8 saat.

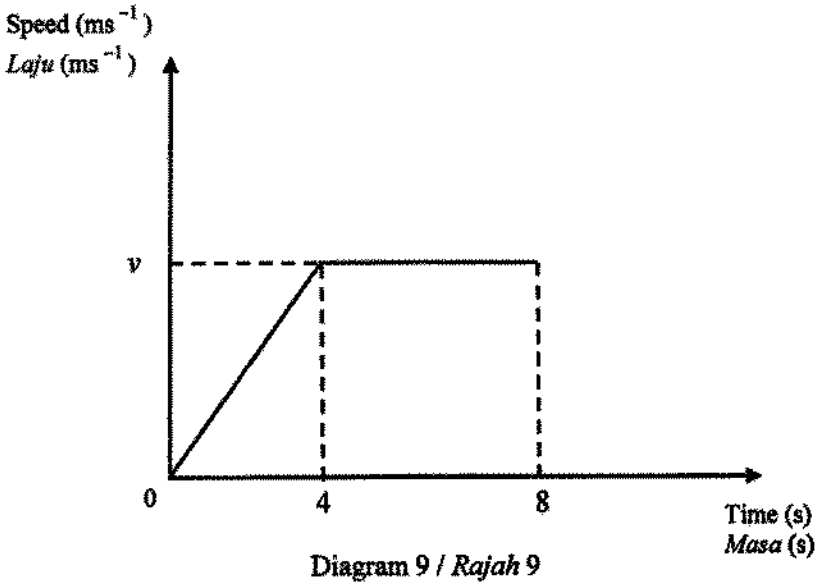


Diagram 9 / *Rajah* 9

Given the distance travelled in the first 4 seconds is 48 m.

Diberi jarak yang dilalui dalam tempoh 4 *saat pertama ialah* 48 m.

Calculate,

Hitung,

(a) the value of *v*.

nilai v.

(b) the rate of change of speed, in ms^{-2}, of the cyclist in the first 4 seconds.

kadar perubahan laju, dalam ms^{-2}, *pelumba basikal itu dalam* 4 saat *pertama.*

(c) The average speed for the period of 8 seconds.

Purata laju bagi tempoh 8 saat.

[6 *marks* / 6 *markah*]

Answer / *Jawapan* :

(a)

(b)

(c)

For Examiner's Use

10 Puan Alya wants to bring two pots of roses from her garden to school. She has two pots of yellow roses (Y) and a pot of red roses (R). First she chooses a pot at random and puts in her car. Then she chooses a second pot at random.

Puan Alya mahu membawa dua pasu bunga ros daripada tamannya ke sekolah. Dia mempunyai dua pasu bunga ros kuning (Y) dan sepasu bunga ros merah (R). Pertama, dia memilih secara rawak satu pasu dan meletaknya dalam kereta. Kemudian dia memilih pula pasu kedua secara rawak.

Diagram 10 shows the tree diagram of the possible outcomes of the event.

Rajah 10 *menunjukkan rajah pokok bagi kesudahan peristiwa yang mungkin.*

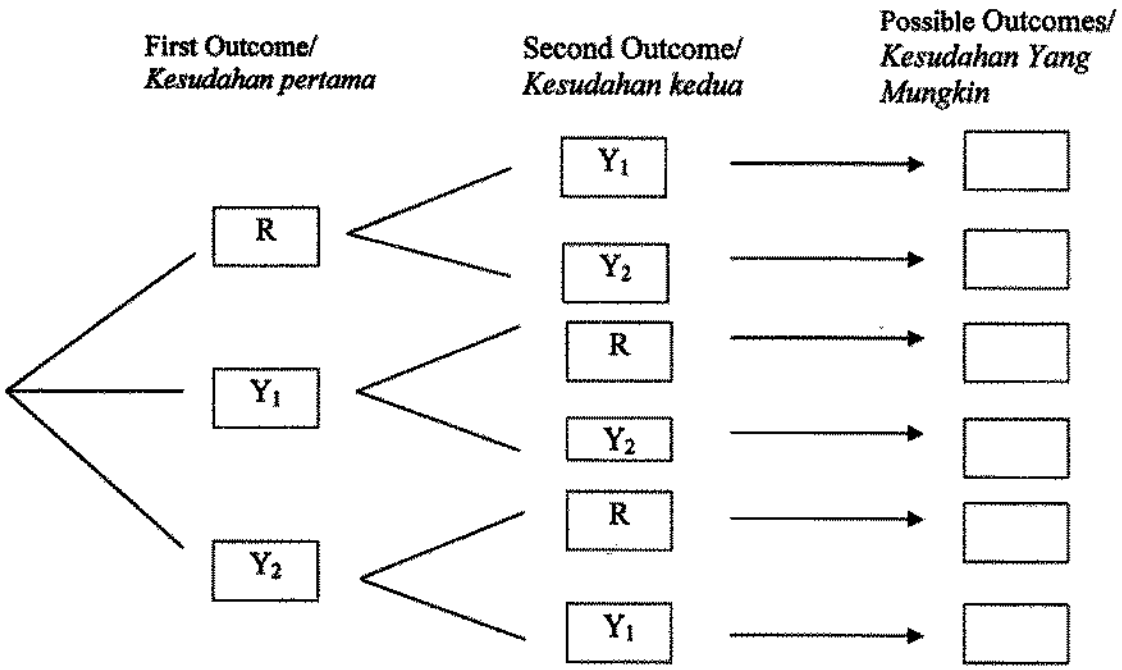


Diagram 10 / Rajah 10

(a) List down all possible outcomes of the event.

Senaraikan semua kesudahan yang mungkin bagi peristiwa itu.

(b) Hence, find the probability that

Seterusnya, cari kebarangkalian bahawa

(i) the first pot has red roses,

pasu pertama adalah bunga ros merah,

(i) both pots are of the same colours or the first pot has red roses.

kedua-dua pasu adalah sama warna atau pasu pertama adalah bunga ros merah.

[5 *marks* / 5 *markah*]

For Examiner's Use

Answer / *Jawapan:*

(a)

(b) **(i)**

(ii)

11 Diagram 11 shows a right prism. The base *PQRS* is a horizontal rectangle. Right angle triangle *PQU* is the uniform cross-section of the prism.

Rajah 11 *menunjukkan sebuah prisma tegak. Tapak segi empat tepat PQRS adalah mengufuk. Segitiga bersudut tegak PQU adalah keratan rentas seragam prisma itu.*

For Examiner's Use

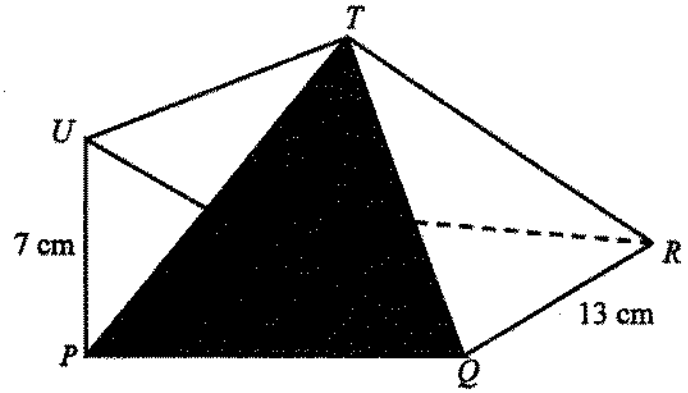


Diagram 11 / *Rajah* 11

(a) Name the angle between the plane *PTQ* and *PQRS*

Namakan sudut antara satah PTQ dan satah PQRS

(b) Calculate the angle between the plane *PTQ* and *PQRS*

Hitung sudut antara satah PTQ dan satah PQRS

[3 *marks* / 3 *markah*]

Answer / *Jawapan:*

(a)

(b)

For Examiner's Use

Sections B / *Bahagian* B

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

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

12 (*a*) Complete Table 12 in the answer space on page **17** for the equation $y = \frac{24}{x}$ by writing down the values of y when $x = 4$ and $x = 10$.

Lengkapkan Jadual 12 *di ruang jawapan pada halaman* **17** *bagi persamaan* $y = \frac{24}{x}$ *dengan menulis nilai-nilai y apabila* $x = 4$ *dan* $x = 10$.

[2 marks / 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 fleksibel.

By using a scale of 1 cm to 1 unit on the x-axis and 1 cm to 1 unit on the y-axis, draw the graph of $y = \frac{24}{x}$ for $1 \cdot 5 \le x \le 14$.

Dengan menggunakan skala 1 cm *kepada* 1 *unit pada paksi-x dan* 1 cm *kepada* 1 *unit pada paksi-y, lukis graf* $y = \frac{24}{x}$ *bagi* $1 \cdot 5 \le x \le 14$.

[4 *marks* / 4 *markah*]

(*c*) From your graph in **12**(*b*), find

Daripada graf anda **12**(*b*), *cari*

(i) the value of y when $x = 3 \cdot 6$,
nilai y apabila $x = 3 \cdot 6$,

(ii) the value of x when $y = 2 \cdot 8$.
nilai x apabila $y = 2 \cdot 8$.

[2 *marks* / 2 *markah*]

(*d*) Draw a suitable straight line on the graph in **12**(*b*) to find the values of x which satisfy the equation $\frac{24}{x} + x - 13 = 0$ for $1 \cdot 5 \le x \le 14$.
State these values of x.

Lukis satu garis lurus yang sesuai pada graf di **12**(*b*) *untuk mencari nilai-nilai x yang memuaskan persamaan* $\frac{24}{x} + x - 13 = 0$ *untuk* $1 \cdot 5 \le x \le 14$.
Nyatakan nilai-nilai x itu.

[4 *marks* / 4 *markah*]

Answer / *Jawapan*:

For Examiner's Use

(*a*) $y = \frac{24}{x}$

x	1.5	2	3	4	6	8	10	12	14
y	16	12	8		4	3		2	1.7

Table 12 / *Jadual* 12

(*b*) Refer graph on page **18**.
Rujuk graf di halaman **18**.

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

(ii) x = ...

(*d*)

The equation of the straight line:
Persamaan garis lurus:

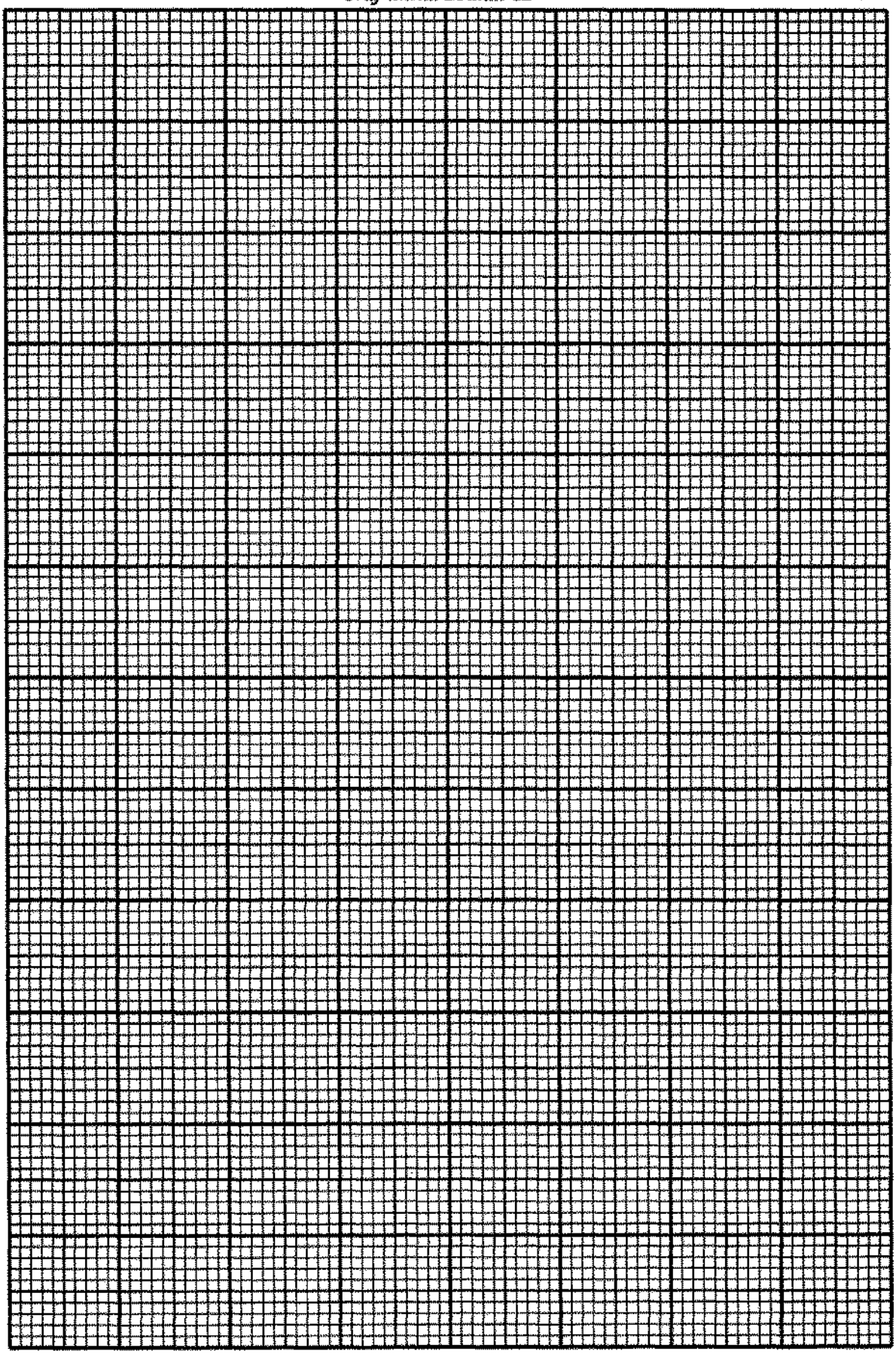
.....

x = ... , ...

For Examiner's Use

Graph for Question 12

Graf untuk Soalan 12



13 Diagram 13 shows quadrilaterals *ABCD*, *EFGH* and *JHKL* drawn on a Cartesian plane.

Rajah 13 *menunjukkan sisi empat ABCD, EFGH dan JHKL yang dilukis pada satah Cartesian.*

For Examiner's Use

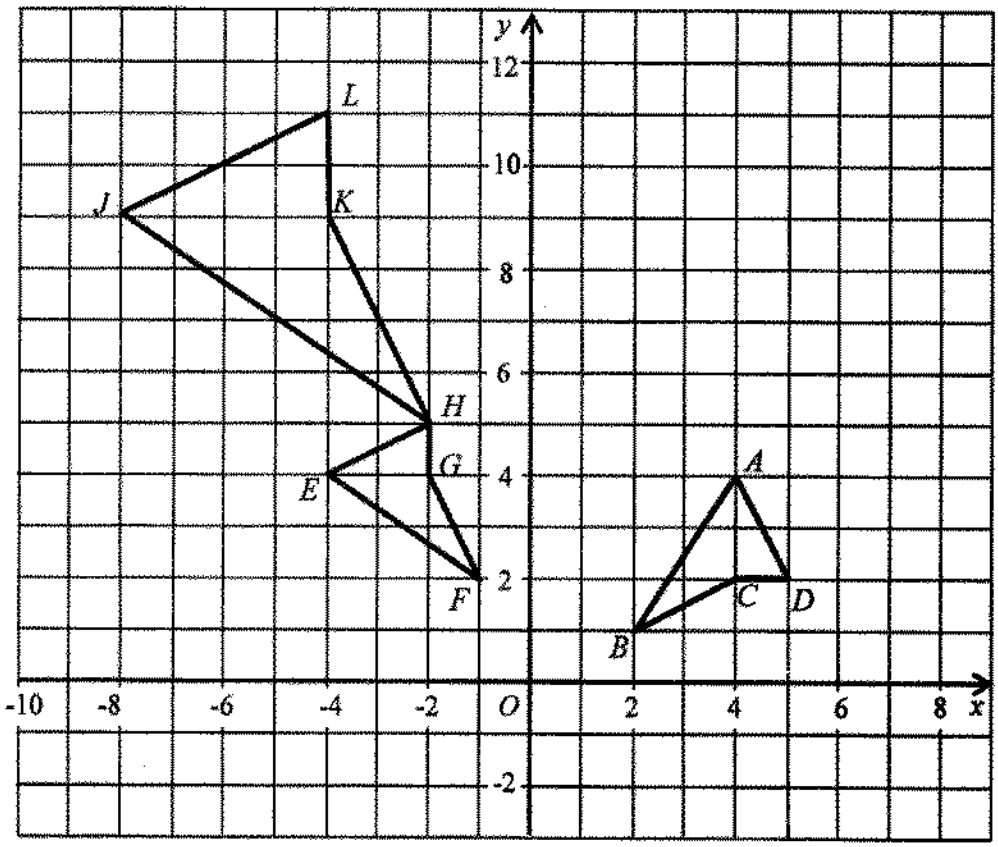


Diagram 13 / *Rajah* 13

(a) Transformation **P** is a reflection on the line $x = -1$.
Transformation **Q** is an anticlockwise rotation of 90° about the centre **E**.
State the coordinates of the image of the point **H** under the following transformations :

Penjelmaan **P** *mewakili satu pantulan pada garis lurus* $x = -1$.

Penjelmaan **Q** *mewakili satu putaran melalui sudut* 90° *ikut lawan arah jam pada pusat* **E**.
Nyatakan koordinat imej bagi titik **H** *di bawah penjelmaan berikut:*

(i) **P**,

(ii) **PQ**.

[3 *marks* / 3 *markah*]

For Examiner's Use

(b) *JHKL* is the image of *ABCD* under the combined transformation **ST**.
Describe in full the transformation :

JHKL ialah imej ABCD dibawah gabungan penjelmaan **ST**.

Huraikan selengkapnya penjelmaan :

(i) **T**,

(ii) **S**.

[6 *marks* / 6 *markah*]

(c) *EFGH* is the image of *JHKL* under an enlargement.
It is given that the area of *EFGH* is 7 m^2.
Calculate the area, in m^2, of *JHKL*.

EFGH ialah imej bagi JHKL di bawah satu pembesaran.
Diberi bahawa luas EFGH ialah 7 m^2.
Hitungkan luas, dalam m^2, JHKL

[3 *marks* / 3 *markah*]

Answer / *Jawapan* :

(a) (i)

(ii)

(b) (i)

(ii)

(c)

14 (a) Table 14 in answer space shows the incomplete frequency table for the scores obtained by 60 students in a Mathematics game.

Jadual 14 *di ruangan jawapan menunjukkan jadual kekerapan yang tidak lengkap bagi skor yang diperoleh* 60 *murid dalam suatu permainan Matematik.*

Using a class interval of 10, complete the Table 1 in the answer space.

Menggunakan selang kelas 10, *lengkapkan Jadual 1 di ruangan jawapan.*

[2 marks/2 *markah*]

(b) Based on the Table 14 in (a),

Berdasarkan Jadual 14 *di* (a),

(i) State the modal class,

Natakan kelas mod,

(ii) calculate the mean score for Mathematics game.

hitungkan min skor bagi permainan Matematik.

[4 marks/4 *markah*]

(c) For this part of the question, use the graph paper provided on page **23**.
By using a scale of 2 cm to 10 scores on the horizontal axis and 2 cm to 2 students on the vertical axis, draw a histogram for the data.

Untuk ceraian soalan ini gunakan kertas graf pada halaman **23**.
Dengan menggunakan skala 2 cm *kepada* 10 *skor pada paksi-x dan* 2 cm *kepada* 2 *orang pelajar pada paksi-y, lukiskan satu histogram bagi data itu.*

[4 marks/4 *markah*]

(d) Students who achieved scores exceeding 49.5 will be awarded certificates.
Find the percentage of students who are qualified for the award.

Pelajar yang mencapai skor melebihi 49.5 *akan dianugerahkan sijil.*
Kira peratus pelajar yang layak dianugerahkan sijil.

[2 marks/2 *markah*]

For Examiner's Use

For Examiner's Use

Answer / *Jawapan*:

(a)

Score *Skor*	**Frequency** *Kekerapan*	**Midpoint** *Titik Tengah*
10 – 19	3	14.5
20 – 29	6	
	10	
	15	
	12	
	9	
	5	

Table 14 / *Jadual* 14

(b) **(i)**

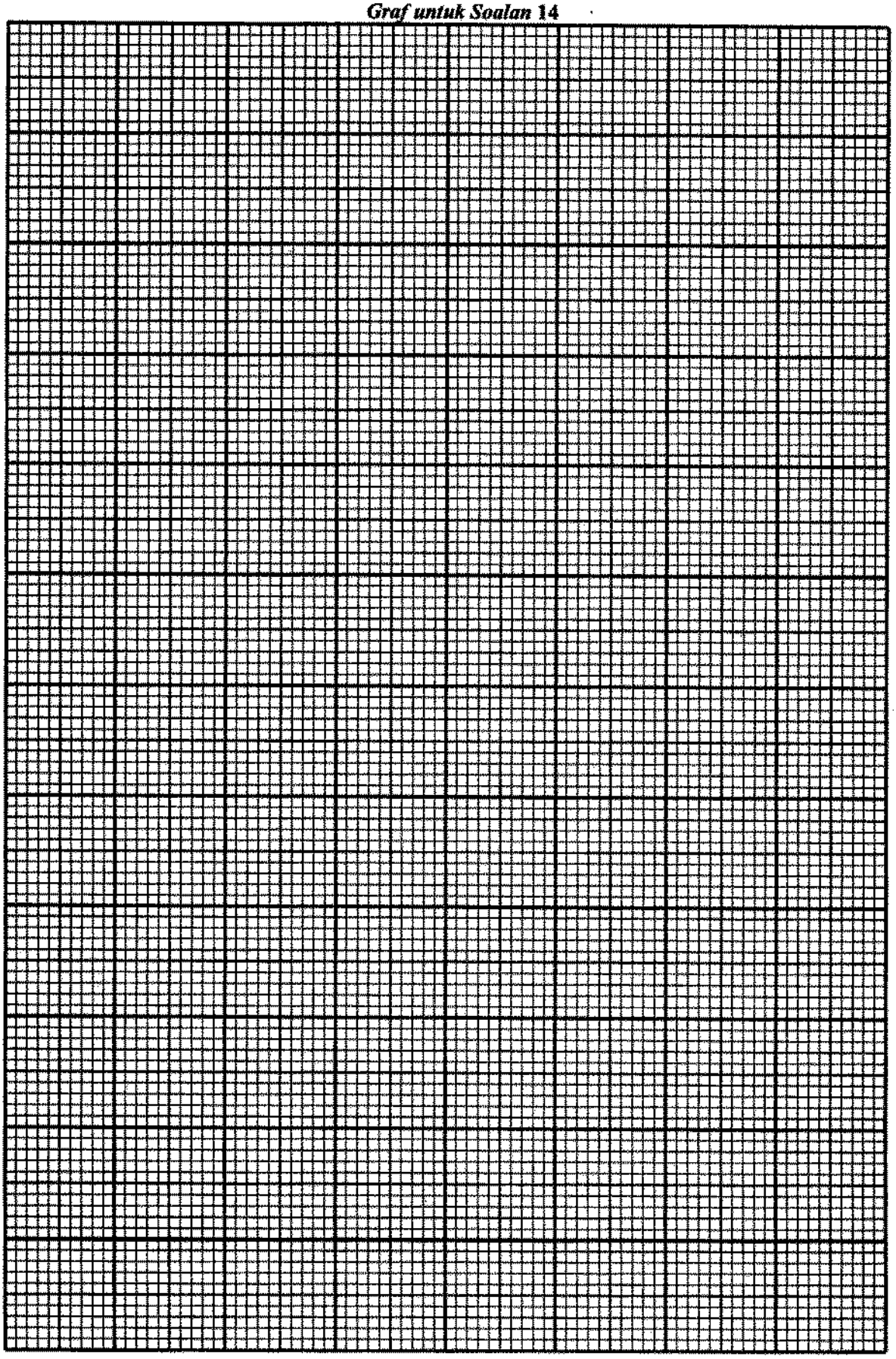
(ii)

(c) **Refer graph on page 22.**
***Rujuk graf di halaman* 22.**

(d)

Graph for Question 14

Graf untuk Soalan 14



For Examiner's Use

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 15.1 shows a solid right prism with rectangular base *ABCD* on a horizontal plane. Rectangle *ABFE* is an inclined plane and triangle *BCF* is a verticle plane.

Rajah 15.1 *menunjukkan sebuah pepejal berbentuk prisma tegak dengan tapak segi empat tepat ABCD terletak di atas satah mengufuk. Segi empat ABFE adalah satah condong dan segi tiga BCF adalah satah tegak.*

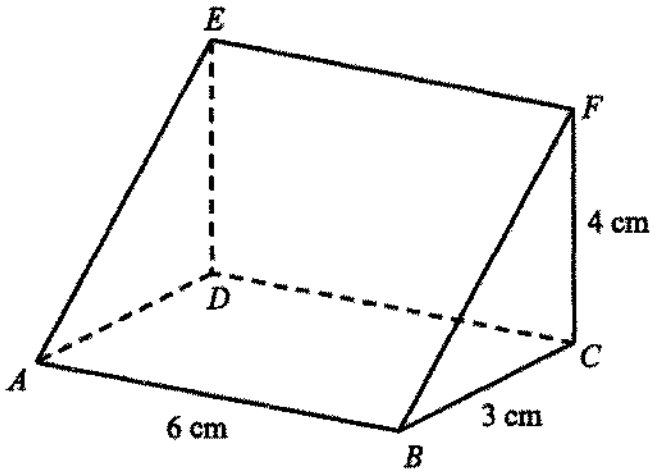


Diagram 15.1/*Rajah* 15.1

Draw to full scale, the plan of the solid.

Lukis dengan skala penuh, pelan pepejal itu.

[3 *marks*/3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*) Another solid right prism with rectangular base *GHIJ* and a trapezium *HIML* as its uniform cross-section is joined to the prism in Diagram 15.1. The base *ABCHIJGD* lies on a horizontal plane. *HL* is a vertical edge. Rectangle *KLMN* is an inclined plane and rectangle *JIMN* is a vertical plane.

Sebuah pepejal lain berbentuk prisma tegak dengan tapak segi empat tepat GHIJ dan trapezium HIML sebagai keratan rentas seragam, dicantumkan kepada prisma dalam Rajah 15.1. Tapak ABCHIJGD terletak pada satu satah mengufuk. Tepi HL adalah tegak. Segi empat tepat KLMN adalah satah condong dan segi empat tepat JIMN adalah satah menegak.

For Examiner's Use

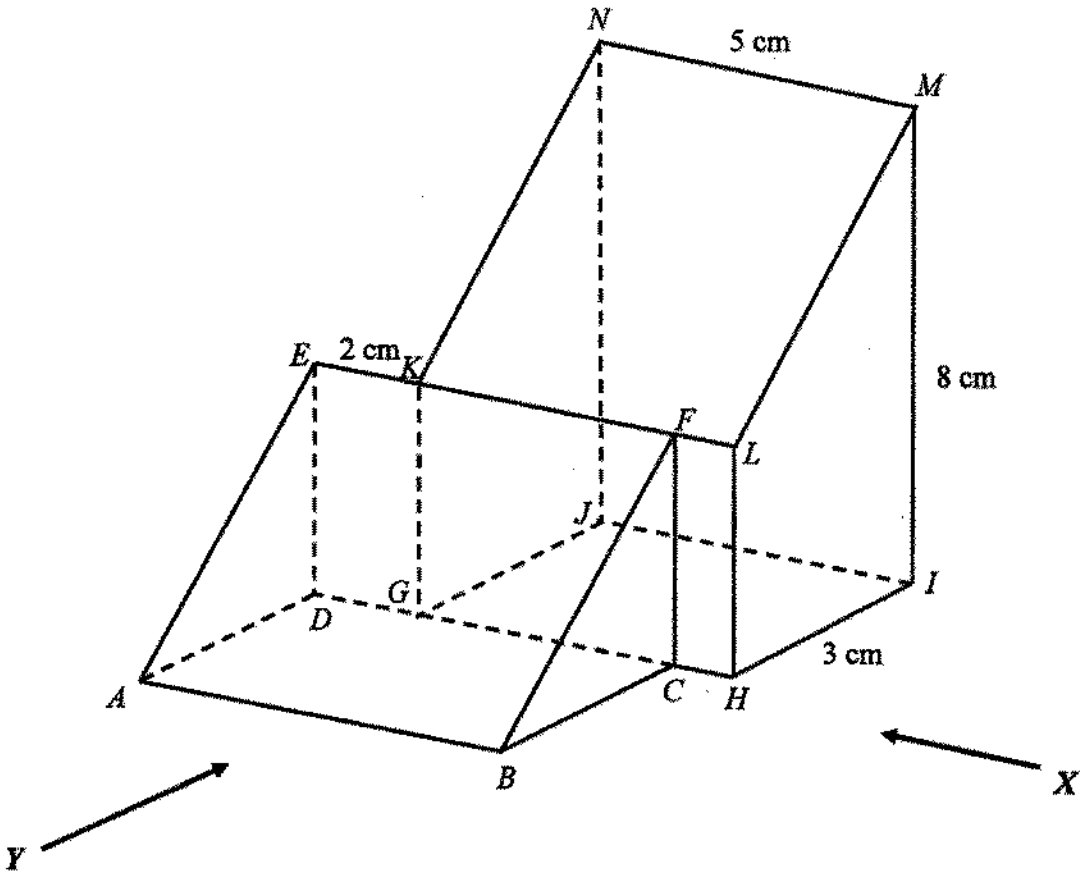


Diagram 15.2/*Rajah* 15.2

Draw to full scale,

Lukis dengan skala penuh,

(*i*) the elevation of the composite solid on a vertical plane parallel to *HI* as viewed from *X*.

Dongakan gabungan pepejal itu pada satah mencancang yang selari dengan HI sebagaimana dilihat dari X.

[4 *marks*/4 *markah*]

(*ii*) the elevation of the composite solid on a vertical plane parallel to *AB* as viewed from *Y*.

Dongakan gabungan pepejal itu pada satah mencancang yang selari dengan AB sebagaimana dilihat dari Y.

[5 *marks*/5 *markah*]

For Examiner's Use

Answer / *Jawapan*:

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

16 In the Diagram 16, N is the North Pole, S is the South Pole, and O is the centre of the earth. P (60° N, 20° E) and Q are two points on the surface of the earth such that PQ is the diameter of a parallel of latitude.

Dalam Rajah 15, N *ialah Kutub Utara dan* S *ialah Kutub Selatan, dan* O *ialah pusat bumi.* P (60° U, 20° T) *dan* Q *ialah dua titik di permukaan bumi dengan keadaan* PQ *ialah diameter selarian latitud.*

For Examiner's Use

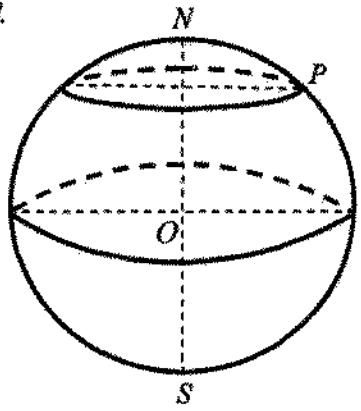


Diagram 16 / *Rajah* 16

(a) PR is the diameter of the earth. On the diagram in answer space, mark the positions of Q and R.
Hence, state the position of R.

Diberi PR *ialah diameter bumi. Pada rajah di ruangan jawapan, tandakan kedudukan bagi* Q *dan* R.
Seterusnya, nyatakan kedudukan R.

[4 *marks* / 4 *markah*]

(b) Calculate the shortest distance, in nautical miles, from P to Q via North Pole.

Hitungkan jarak terpendek, dalam batu nautika, dari P *ke* Q *melalui Kutub Utara.*

[2 *marks* / 2 *markah*]

(c) An aeroplane took off from P and flew due west along its parallel of latitude with an average speed of 800 knots. The aeroplane took 4 hours and 30 minutes to reach a point T.

Sebuah kapal terbang bertolak dari P *arah ke barat di sepanjang selarian latitud sepunya dengan laju purata* 800 knots. *Kapal terbang itu mengambil masa* 4 jam 30 minit *untuk tiba di satu titik* T.

Calculate

Kirakan

(i) the distance, in nautical miles, from P to T,

jarak, dalam batu nautika, dari P *ke* T.

(ii) the longitude of T.

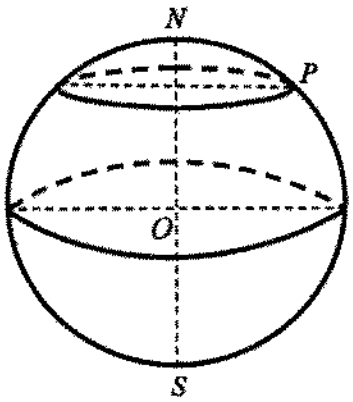
longitude T.

[6 *marks* / 6 *markah*]

For Examiner's Use

Answer/Jawapan:

(a)



(b)

(c) (i)

(ii)

END OF QUESTION PAPER / *KERTAS SOALAN TAMAT*

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of two section : **Sections A** *and* **Sections B.**

   Kertas soalan ini mengandungi dua bahagian: **Bahagian A** *dan* **Bahagian B.**

2. Answer **all** questions in **Sections A** and **all** questions from **Sections B.**

   Jawab **semua** *soalan dalam* **Bahagian A** *dan mana-mana* **empat** *soalan daripada* **Bahagian B.**

3. Write your answers in the spaces provided in the question paper

   Tulis jawapan anda pada ruang yang disediakan dalam kertas soalan ini.

4. Show your working. It may help your to get marks.

   Tunjukkan langkah-langkah penting. 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 new answer.

   Jika anda hendak menukarkan jawapan, batalkan jawapan yang telah dibuat. Kemudian tuliskan jawapan yang baru.

6. The diagrams in the questions provided are not drawn to scale unless stated.

   Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.

7. The marks allocated for each question and sub-part of a question are shown in brackets.

   Markah yang diperuntukkan bagi setiap soalan dan ceraian soalan ditunjukkan dalam kurungan.

8. A list of formulae is provided on pages 2 to 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.

1449/1&2(PP)
Matematik
Kertas 1 & 2
Ogos 2011
PERATURAN
PEMARKAHAN

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN PERCUBAAN

SIJIL PELAJARAN MALAYSIA (OTI 2)

TAHUN 2011

MATEMATIK

Kertas 1 & 2

PERATURAN PEMARKAHAN

$$\text{Markah} = \frac{Kertas1 + Kertas2}{140}$$

Peraturan pemarkahan ini mengandungi 14 halaman bercetak

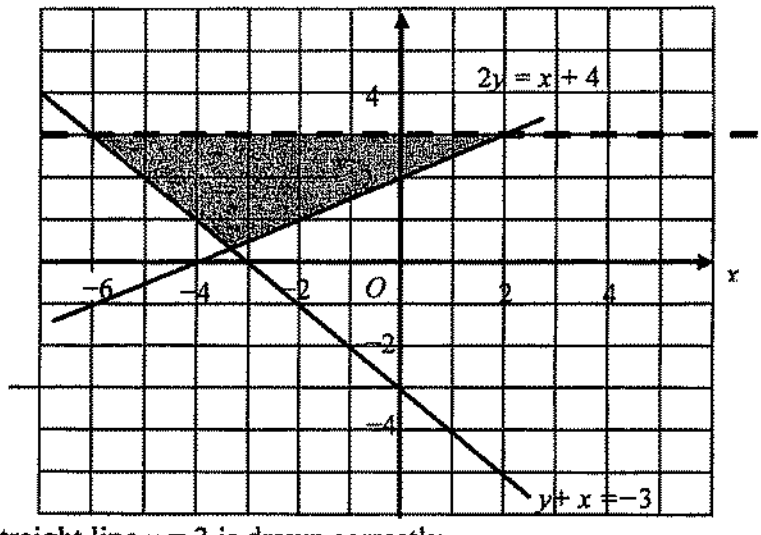
MATEMATIK KERTAS 1

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

1449/1 & 2

SKEMA PERMARKAHAN
PEPERIKSAAN PERCUBAAN SPM

MATEMATIK KERTAS 2

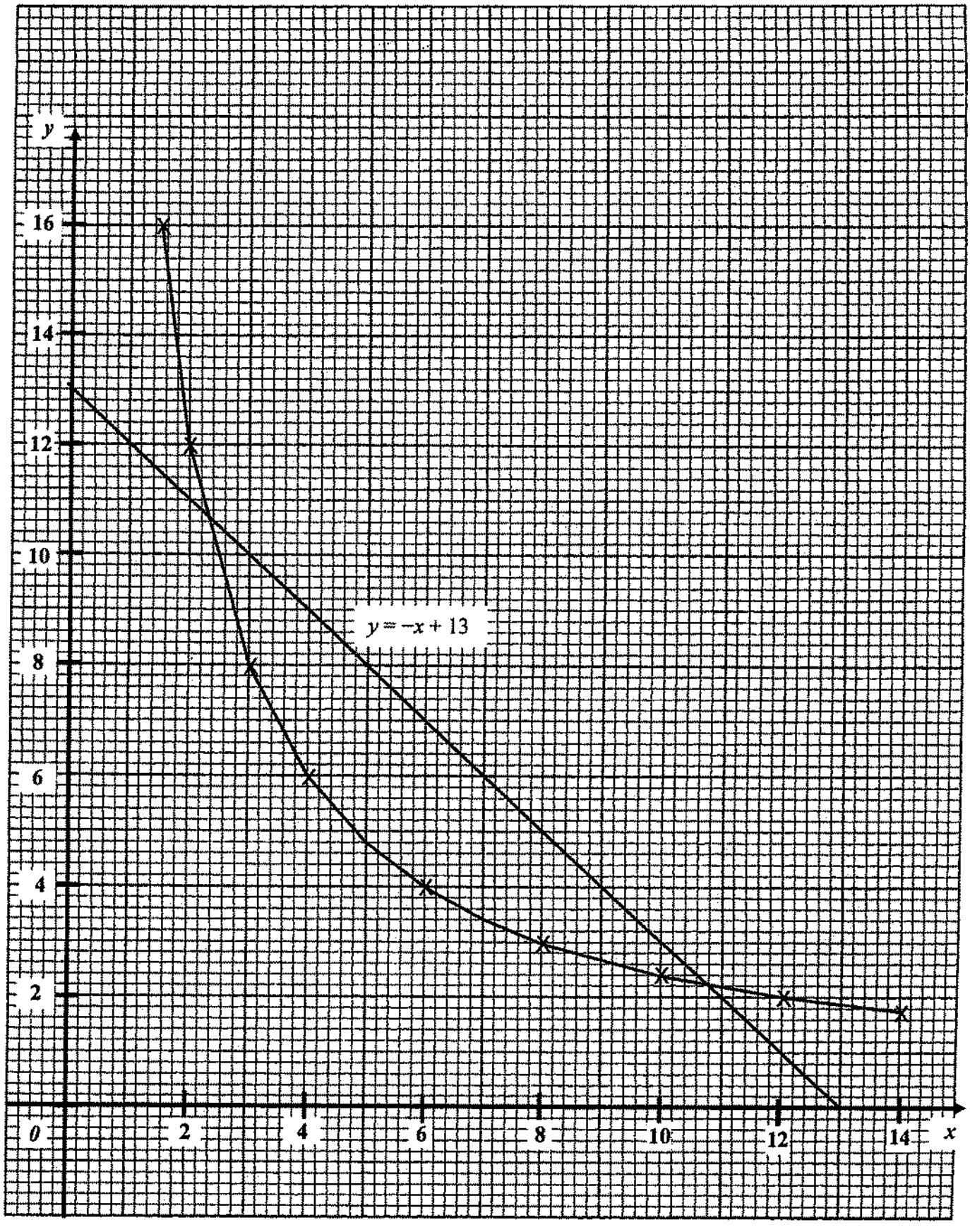
No. Soalan	Peraturan Pemarkahan	Markah	
1	 Straight line $y = 3$ is drawn correctly The region is shaded correctly Note : $y = 3$ is drawn in full line, give K1P1	 P1 P2	 3
2	$20x + 3y = 48$ *or* $10x - 15y = 90$ *or* $y = \frac{2x-18}{3}$ or equivalent $22x = 66$ or $-33y = 132$ $x = 3, \quad y = -4$	K1 K1 N1N1	 4

3	$3x^2 - 11x - 4 = 0$ $(3x+1)(x-4) = 0$ $x = -\frac{1}{3}, \quad 4$ Note : Accept without " = 0 "	K1 K1 N1N1	4
4	30×6 $\frac{1}{2} \times \frac{4}{3} \times \frac{22}{7} \times \left(\frac{7}{2}\right)^3$ $30 \times 6 \ - \frac{1}{2} \times \frac{4}{3} \times \frac{22}{7} \times \left(\frac{7}{2}\right)^3$ *or any equivalent* $90\frac{1}{6}$ *or* 90.17 *or* $\frac{541}{6}$	K1 K1 K1 N1	4
5	(a) If $(n+1)$ is an even integer, then n is an odd integer. True (b) Implication 1: If $\frac{m}{n}$ is a proper fraction, then m and n are integers with $0 < m < n$ Implication 2: If m and n are integers with $0 < m < n$, then $\frac{m}{n}$ is a proper fraction. (c) $4(n^2) - 3 \qquad n = 1, 2, 3, 4 \ldots$ Note : $4(n^2) - 3$ give K1	P1 P1 P1 P1 K2	6

6	a) $m_{PQ} = -\frac{1}{2}$	P1	
	$\frac{y-3}{x-2} = -\frac{1}{2}$ *or* $3 = -\frac{1}{2}(2) + c$	K1	
	$y = -\frac{1}{2}x + 4$	N1	
	(b) $-\frac{1}{2}x + 4 = 0$ *or* $\frac{0-3}{x-2} = -\frac{1}{2}$ *or* $\frac{-(4)}{x-\text{intercept}} = -\frac{1}{2}$	K1	
	8	N1	5
7	(a) $\frac{90}{360} \times 2 \times \frac{22}{7} \times 14$ *or* $\frac{60}{360} \times 2 \times \frac{22}{7} \times 7$	K1	
	$\frac{90}{360} \times 2 \times \frac{22}{7} \times 14 + 14 + 7 + \frac{60}{360} \times 2 \times \frac{22}{7} \times 7 + 7$	K1	
	57.33 Note: Accept $57\frac{1}{3}$ or $\frac{172}{3}$ for N1	N1	
	(b) $\frac{90}{360} \times \frac{22}{7} \times 14 \times 14$ *or* $\frac{60}{360} \times \frac{22}{7} \times 7 \times 7$	K1	
	$\frac{90}{360} \times \frac{22}{7} \times 14 \times 14 - \frac{60}{360} \times \frac{22}{7} \times 7 \times 7$	K1	6
	128.33 Note: Accept $128\frac{1}{3}$ or $\frac{385}{3}$ for N1	N1	

8	a) $p=\frac{1}{2}$ $t=1$ b) $\begin{pmatrix}2 & -1\\ -4 & 3\end{pmatrix}\begin{pmatrix}x\\ y\end{pmatrix}=\begin{pmatrix}-3\\ 5\end{pmatrix}$ $\begin{pmatrix}x\\ y\end{pmatrix}=\frac{1}{2(3)-(-1)(-4)}\begin{pmatrix}3 & 1\\ 4 & 2\end{pmatrix}\begin{pmatrix}-3\\ 5\end{pmatrix}$ $x=-2,\quad y=-1$	P1P1 P1 K1 N1N1	6
9	a) $v = 24$ b) $\frac{24-0}{4-0}$ 6 c) 48 + (24 x 4) or $\frac{144}{8}$ 18	P1 K1 N1 K2 N1	6
10	a) $\{(R,Y_1),(R,Y_2),(Y_1,R),(Y_1,Y_2),(Y_2,R),(Y_2,Y_1)\}$ b) $\{(R,Y_1),(R,Y_2)\}$ $\frac{2}{6}$ @ $\frac{1}{3}$ c) $\{(Y_1,Y_2),(Y_2,Y_1),(R,Y_1),(R,Y_2)\}$ $\frac{4}{6}$ @ $\frac{2}{3}$	P1 K1 N1 K1 N1	5
11	a) $\angle SPT$ b) $Tan\angle SPT=\frac{7}{13}$ 28°18' @ 28.3°	P1 K1 N1	3

12	a) 6	K1	
	2.4	K1	
	(b) *Graph :* Axes drawn in the correct direction with uniform scales. for $1.5 \le x \le 14$ and $1 \le y \le 16$.	P1	
	All 7 points and *2 points correctly plotted or curve passes through all points for $1.5 \le x \le 14$ and $1 \le y \le 16$.	K2	
	Note: 1. 7 @ 8 points are correctly plotted, K1 2. Ignore curve out of range		
	A smooth and continuous curve without any straight line passes through all 9 correct points using the given scales for $1.5 \le x \le 14$ and $1 \le y \le 16$.	N1	
	(c) (i) $6.6 \le y \le 7.0$ (ii) $8.4 \le x \le 8.8$ } The graph is drawn	P1 P1	
	(d) Identify equation $y = -x+13$ *or* $\frac{24}{x} = -x+13$	K1	
	Straight line $y = -x+13$ correctly drawn	K1	
	$2.2 \le x \le 2.5$ $10.6 \le x \le 10.9$	N1 N1	
	Note: (i) Allow N mark if the values of x are shown on the graph. (ii) The values of x obtained by calculation, give N0		12



13(a)	(i) (0, 5)	P1	
	(ii) (3, 6)	P2	
	Note: (−5, 6), give P1.		
(b)	(i) **T** : Rotation, 90^0 anti clockwise, centre at O @ (0, 0) @ origin	P3	
	Note : 1. Rotation, 90^0 anticlockwise or Rotation, centre at O @ (0, 0) give P2 2. Rotation only give P1		
	(ii) **S** : Enlargement with scale factor 2 at centre (0, −1).	P3	
	Note : 1. Enlargement at centre (0, −1) *or* Enlargement with scale factor 2, award P2 2. Enlargement, award P1		
(c)	$k = \frac{1}{2}$	P1	
	$7 = \left(\frac{1}{2}\right)^2 A_o$ atau setara	K1	
	28	N1	
			12

14 (a)

	Score	Frequency	Midpoint
I	10 – 19	3	14.5
II	20 – 29	6	24.5
III	30 – 39	10	34.5
IV	40 – 49	15	44.5
V	50 – 59	12	54.5
VI	60 – 69	9	64.5
VII	70 – 79	5	74.5

Score : (III to VII) all correct P1
Midpoint : (II to VII) all correct P1

(b)(i) 40 – 49 P1

(ii) $\frac{(3\times14.5)+(6\times24.5)+(10\times34.5)+(15\times44.5)+(12\times54.5)+(9\times64.5)+(5\times74.5)}{60}$ K2

$= 46.83$ or $46\frac{5}{6}$ *or* $\frac{281}{6}$ N1

(c) Histogram
Axes are drawn in the correct direction.
Uniform scale is used and x-axis is labelled by midpoints or lower and upper boundaries or class intervals P1

All 7 bars are correctly drawn K2

Complete histogram N1

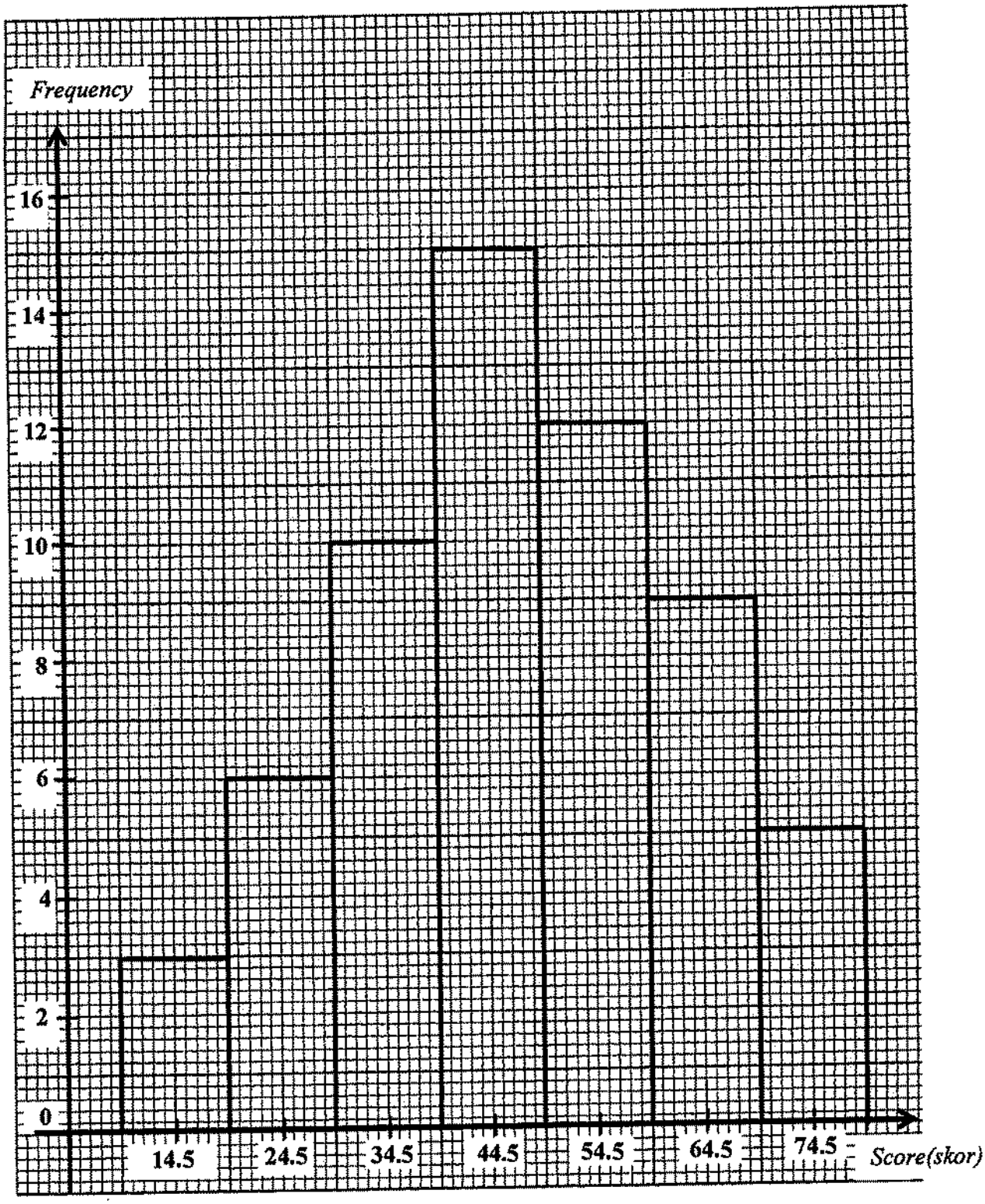
Note:

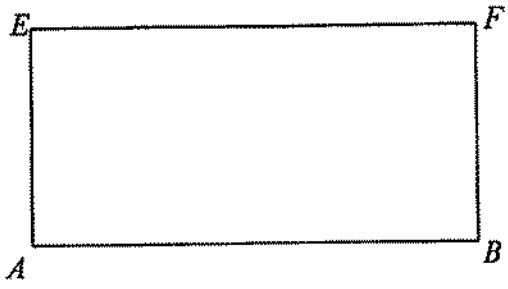
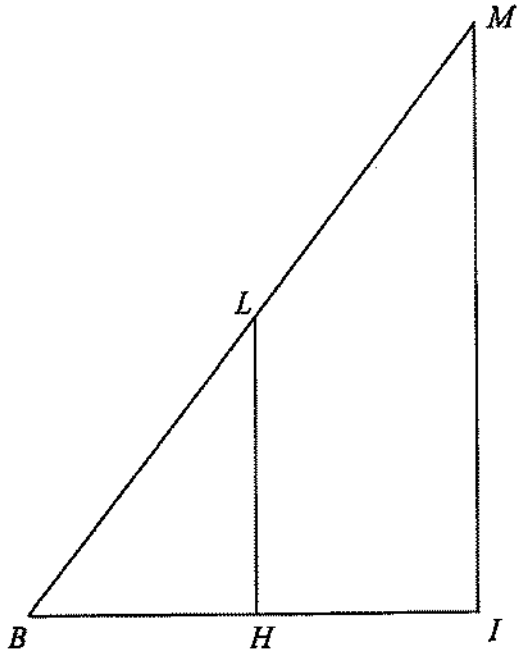
5 or 6 bars are correctly drawn, give K1

(d) $\frac{26}{60}\times100$ K1

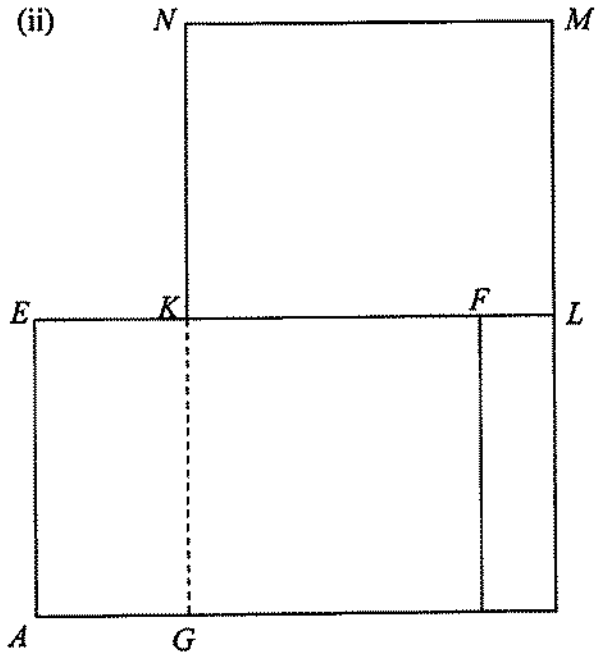
$= 43.33$ *or* $43\frac{1}{3}$ *or* $\frac{130}{3}$ N1

12

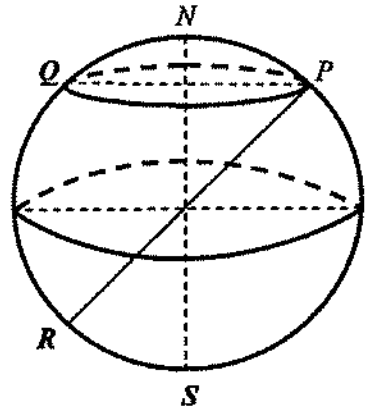


15	(a)  Correct shape with rectangle $ABFE$ All solid lines $AB > AE$ Measurements correct to ± 0.2 cm (one way) and all angles at vertices of rectangle $= 90° \pm 1°$	K1 K1 N1	3
	(b) (i)  Correct shape with triangles BIM and BHL. All solid lines $IM > HL > BH = HI$ Measurements correct to ± 0.2 cm (one way) and all angles at H and $I = 90° \pm 1°$.	K1 K1 N2	4

(b) (ii)



Correct shape with rectangles *ABFE*, *BHLF* and *KLMN*. All solid lines.	K1	
Note : Ignore *GK*.	K1	
G and *K* joined with dashed line to form a straight line *GKN*.	K1	
$NM > AH > ML = LH = GB > AG > BH$	N2	5
Measurements correct to ± 0.2 cm (one way) and all angles at vertices of rectangles is 90° ± 1°		12

16.	(a)	Point of Q Point of R  R (60° S, 160° W) Note : 60° S or 160° W give P1	P1 P1 P2	
	(b)	60×60 3600	K1 N1	
	(c) (i)	800×4.5 3600	K1 N1	
	(ii)	Using Cos 60° $\frac{3600}{60 \text{ Cos } 60°}$ $\frac{3600}{60 \text{ Cos } 60°} - 20°$ or $120° - 20°$ $100° W$	P1 K1 K1 N1	12

END OF MARKING SCHEME
SKEMA PEMARKAHAN TAMAT