1449/1
MATHEMATICS (P)
Kertas 1
September 2011
1 ¼ jam

MATHEMATICS
Tingkatan Lima
Kertas 1
Satu Jam Lima Belas Minit

JANGAN BUKA KERTAS SOALAN SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam Bahasa Inggeris mendaului soalan yang sepadan dalam Bahasa Melayu.
3. Calon dikehendaki membaca maklumat di halaman akhir.

Kertas ini mengandungi 20 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* =
$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

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

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

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

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

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

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

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

10 Pythagoras Theorem:
Tearem Pithagaras:
$c^2 = a^2 + b^2$

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

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

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 = $\pi d = 2\pi r$

Liliton bulatan = $\pi d = 2\pi j$

3 Area of circle = πr^2

Luas bulatan = πj^2

4 Curved surface area of cylinder = $2\pi r h$

Luas permukaan melengkung silinder = $2\pi j t$

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

Luas permukaan sfera = $4\pi j^2$

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

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

Isipadu silinder = $\pi j^2 t$

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

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

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

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

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

Isipadu piramid tegak = $\frac{1}{3}\times luas\ topok \times tinggi$

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

Hasil tambah sudut pedalaman poligon $= (n-2)\times 180^o$

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

$$\frac{ponjong\ lengkok}{lilitan\ buloton} = \frac{sudut\ pusot}{360^\circ}$$

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

$$\frac{luas\ sektar}{luas\ bulatan} = \frac{sudut\ pusat}{360^\circ}$$

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

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

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

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

1. Round off 0.2847 to two significant figuras.
Bundarkan 0.2847 kepada dua angka bererti.

A	0.20	C	0.29
B	0.28	D	0.30

2. The sun is approximataly 14,880,000,000,000 cm from tha earth. Express this distance, in km, in standard form.
Matahari adalah lebih kurang 14,880,000,000,000 cm dari Bumi. Nyatakan jarak ini, dalam km, dalam bentuk piawai.

A	1.488×10^{8}	C	1488×10^{5}
B	1.488×10^{13}	D	1488×10^{10}

3. $4.7\times10^{12}-8.2\times10^{11}=$

A	3.5×10^{11}	C	3.5×10^{12}
B	3.88×10^{11}	D	3.88×10^{12}

4. Distance is equal to speed multiplied by time. An object travelling at 100 km/h would taka approximately 0.44 years to reach the moon. Given that there are 365 days in a year, calculate the distance, in km, between the earth and the moon. Give your answer in standard form.
Jarak ialah kelajuan darab dengan masa. Satu objek yang bergerak dengan laju 100 km/j akan mengambil masa lebih kurang 0.44 tahun untuk sampai ke bulan. Diberi terdapat 365 hari dalam setahun, kirakan jarak, dalam km, antara bumi dan bulan. Berikan jawapan anda dalam bentuk piawai.

A	1.61×10^{4}	C	3.85×10^{5}
B	8.30×10^{4}	D	1.99×10^{6}

5. $1000101_2-1011_2=$

A	101010_2	C	1001010_2
B	111010_2	D	1001110_2

8. Express 304_5 as a number in base 8.
Nyatakan 304_5 *sebagai nombor dalam asas 8.*

A 117_8 C 221_8
B 122_8 D 711_8

7. Diagram 7 shows a rhombus KLMN. The straight lines SKMR and PNQ ere parallel.
Rajah 7 menunjukkan sebuah rombus KLMN. Garis lurus SKMR dan garislurus PNQ adalah selari.

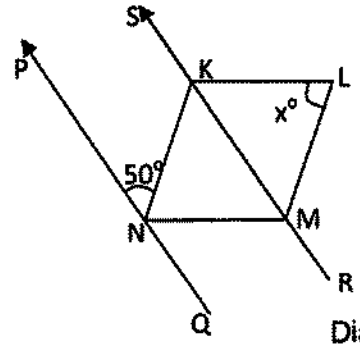


Diagram 7
Rajah 7

Find the value of x.
Cari nilai x.

A 80 C 100
B 90 D 130

8. In Diagram 8, KNP is a tangent to the circle with centre O.
Dalam Rajah 8, KNP ialah tangen kepada bulatan berpusat di O.

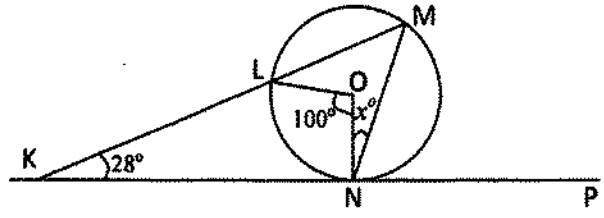


Diagram 8
Rajah 8

Find the velue of x.
Cari nilai x.

A 12 C 40
B 25 D 50

9. Diagram 9 shows two hexagons P and Q drawn on a square grid. Q is the image of P under a transformation.
Rajah 9 menunjukkan dua heksagon P dan Q yang dilukis pada grid segi empat sama. Q ialah imej P di bawah satu transformasi.

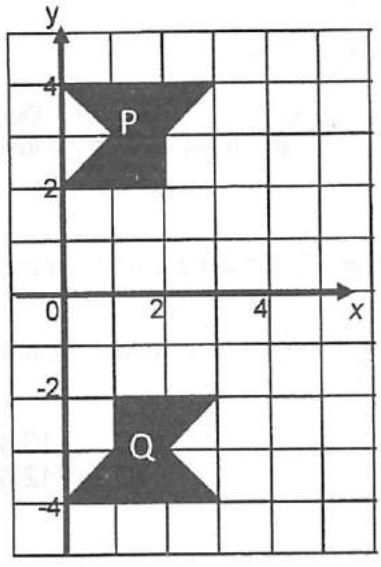


Diagram 9
Rajah 9

The transformation is
Transformasi itu ialah

A Translation
Translasi

B Reflection
Pantulan

C Rotation
Putaran

D Enlargement
Pembesaran

10. Diagram 10 shows five trapeziums drawn on a square grid.
Rajah 10 menunjukkan lima trapezium yang dilukis pada grid segi empat sama.

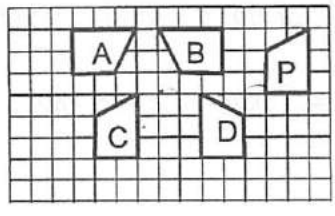


Diagram 10
Rajah 10

Which of the following A, B, C or D is the image of P under a translation?
Di antara A, B, C dan D, yang manakah imej bagi P di bawah suatu translasi?

11. Diagram 11 shows a right anglad triangle PQS. QRS is a straight lina.
Rajah 11 menunjukkan segi tiga bersudut tegak PQS. QRS ialah garis lurus.

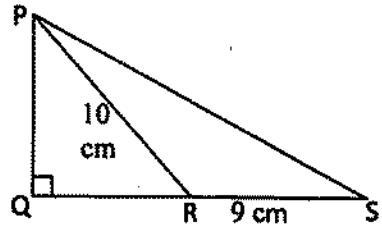


Diagram 11
Rajah 11

Given that $\cos \angle PRS = -\frac{3}{5}$, find the length, in cm, of PS.

Diberi $\text{kos} \angle PRS = -\frac{3}{5}$, *cari panjang, dalam cm, bagi PS.*

A 20
B 17
C 13.45
D 12.65

12. Givan that $\tan x° = -4.01$ and $0° \le x \le 360°$, find the possible valuas of x.
Diberi bahawa $\tan x° = -4.01$ *dan* $0° \le x \le 360°$, *cari nilai-nilai yang mungkin bagi* x.

A 76°,104°
B 104°,284°
C 256°,284°
D 76°,256°

13. Givan that $\sin x = \frac{3}{5}$ for $90° \le x \le 180°$, find the value of $\tan x$.

Diberi bahawa $\sin x = \frac{3}{5}$ *bagi* $90° \le x \le 180°$, *cari nilai* $\tan x$.

A $\frac{3}{4}$
B $-\frac{3}{4}$
C $\frac{4}{5}$
D $-\frac{4}{5}$

14. Diagram 14 shows a right prism where PRQ and UST are equilateral triangles. M and N are the midpoints of RQ and ST respectively.
Rajah 14 menunjukkan satu prisma tegak di mana PRQ dan UST adalah segi tiga sama sisi. M dan N ialah titik tengah RQ dan ST masing-masing.

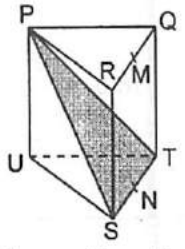


Diagram 14
Rajah 14

Find the angle between the plane PST and the plane UTS.
Cari sudut di antara satah PST dan satah UTS.

A $\angle PNU$
B $\angle PNM$
C $\angle PSU$
D $\angle PST$

15. In Diagram 15, P and Q are two points on a horizontal plane. PT is a vertical pole.
Dalam Rajah 15, P dan Q adalah dua titik di atas satah ufuk. PT ialah sebatang tiang yang tegak.

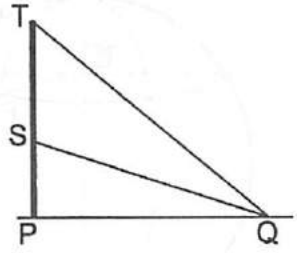


Diagram 15
Rajah 15

Name the angle of elevation of T from Q.
Namakan sudut dongakan T dari Q.

A $\angle QPT$
B $\angle QST$
C $\angle PQT$
D $\angle SQT$

18. In Diagram 16, MN and PQ are two vertical poles on e horizontal plane MP.
Dalam Rajah 16, MN dan PQ adalah dua tiang tegak di atas satah ufuk MP.

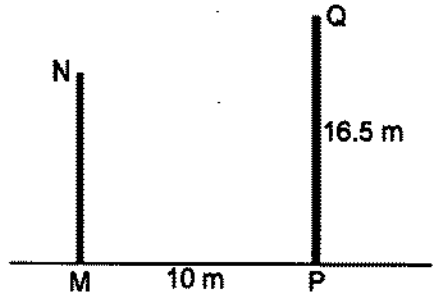


Diagram 16
Rajah 16

Given the angle of depression of N from Q is 35°, find the height, in m, of the pole MN.
Diberi sudut tunduk N dari Q ialah 35°, cari tinggi, dalam m, tiang MN.

A 6.5
B 8.3
C 9.5
D 10.8

17 In Diagram 17, C is the centre of the parallel of latitude 60°N.
Dalam Rajah 17, C ialah pusat bagi selarian latitud 60°U.

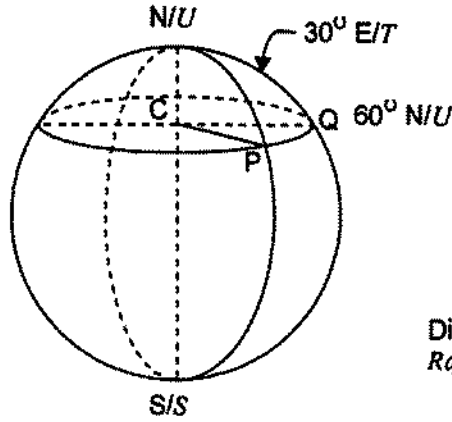


Diagram 17
Rajah 17

Given that $\angle PCQ$ is 50°, find the longitude of P.
Diberi bahawa $\angle PCQ$ ialah 50°, cari longitud bagi P.

A 20° W
B 20° E
C 80° W
D 80° E

18. In Diagram 18 , O is the centre of the earth. P and Q lie on the same meridian.
Dalam Rajah 18, O ialah pusat bumi. P dan Q terletak di meridian yang sama.

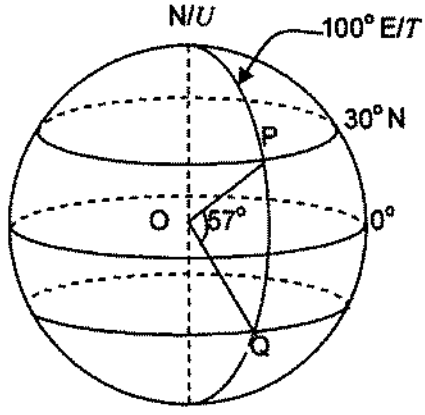


Diagram 18
Rajah 18

The location of Q is
Kedudukan Q ialah

A $(27°S, 80°W)$
B $(27°S, 100°E)$
C $(63°S, 80°W)$
D $(63°S, 100°E)$

19. Diagram 19 shows three points P, Q and R on a horizontal plane.
Rajah 19 menunjukkan tiga titik P, Q dan R yang terletak di atas satah mengufuk.

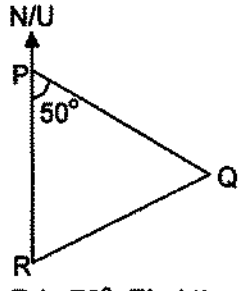


Diagram 19
Rajah 19

The bearing of Q from R is 73°. Find the bearing of R from Q.
Bearing Q dari R ialah 73°. Cari bearing R dari Q.

A 107°
B 123°
C 237°
D 253°

20. $7p - 3(1 - 2p) =$

A $p - 3$
B $5p - 3$
C $9p - 3$
D $13p - 3$

21. Given thet $p+4=3-2(p-5)$, find the value of p.

Diberi bahawa $p+4=3-2(p-5)$, *cari nilai p.*

A $\frac{4}{3}$ C $-\frac{11}{3}$

B 3 D -2

22. Express $\frac{3-e}{2e}-\frac{4e+1}{e}$ as a single fraction in its simplest form.

Nyatakan $\frac{3-e}{2e}-\frac{4e+1}{e}$ *sebagai pecahan tunggal dalam bentuk terendah.*

A $\frac{5-9e}{2e}$ C $\frac{1-9e}{2e}$

B $\frac{5-6e}{2e}$ D $\frac{7-6e}{2e}$

23. Given $p=\frac{q+1}{q-1}$, express q in terms of p.

Diberi $p=\frac{q+1}{q-1}$, *nyatakan q dalam sebutan p.*

A $\frac{1-p}{1+p}$ C $\frac{2}{1+p}$

B $\frac{p+1}{p-1}$ D $\frac{2}{p-1}$

24. Simplify $\left(\frac{1}{7}\right)^{-3}$

Permudahkan $\left(\frac{1}{7}\right)^{-3}$

A 343 C 21

B $\frac{1}{343}$ D $\frac{1}{21}$

25. Given $2^{3x} = \frac{64}{4^x}$, find x.

Diberi $2^{3x} = \frac{64}{4^x}$, *cari* x.

A $\frac{2}{3}$ C $\frac{6}{5}$

B 1 D 2

26. Diegram 26 shows a line number showing the possible values of m.
Rajah 26 ialah satu garis nombor yang menunjukkan nilai-nilai mungkin bagi m.

Diagram 26
Rajah 26

Given that m is an Integer end $p \le m < q$, state the velues of p and q.
Diberi m *ialah integer dan* $p \le m < q$, *nyatakan nilai* p *dan nilai* q.

A $p = 3, q = 8$ C $p = 4, q = 8$

B $p = 3, q = 9$ D $p = 4, q = 9$

27. List ell the integers of x which satisfy the simulteneous inequalities

$5 < 11 - 3x$ and $4 + \frac{x}{2} \ge 3$

Senaraikan semua integer bagi x *yang memuaskan ketaksamaan serentak*

$5 < 11 - 3x$ *dan* $4 + \frac{x}{2} \ge 3$

A $\{-1, 0, 1\}$ C $\{-2, -1, 0, 1\}$

B $\{-1, 0, 1, 2\}$ D $\{-2, -1, 0, 1, 2\}$

28. Diagram 28 shows a sketch of the function $y = px^n + 3$.
Rajah 28 menunjukkan lakaran bagi fungsi $y = px^n + 3$.

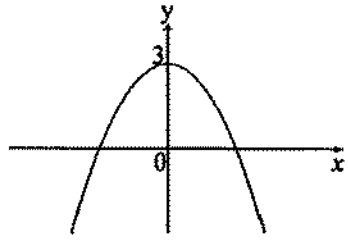


Diagram 28
Rajah 28

State the possible valuas of n and p.
Nyatakan nilai-nilai yang mungkin bagi n dan p.

A $n = 2, p = -1$
B $n = 2, p = 1$
C $n = -2, p = -1$
D $n = -2, p = 1$

29. Diagram 29 is a bar chart which shows the number of goals scored by a hockey team in soma matches.
Rajah 29 ialah carta bar yang menunjukkan bilangan gol yang dijaringkan oleh satu pasukan hoki dalam beberapa pertandingan.

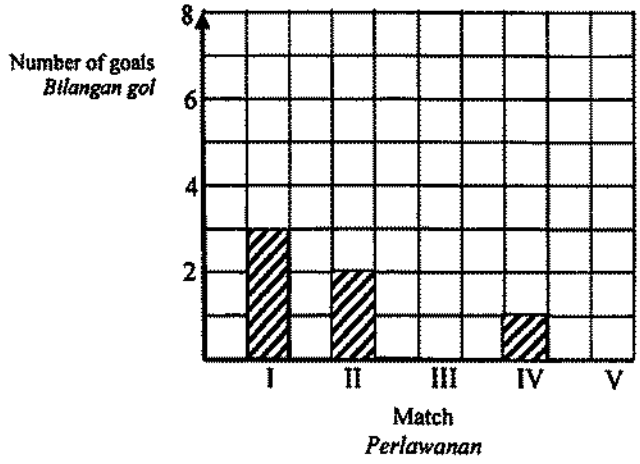


Diagram 29
Rajah 29

The team scored a total of 16 goals in 5 matches. Given that they scored twice as many goals in Match V than in Match I, how many goals did they score in Match III?
Pasukan ini telah menjaringkan 16 gol dalam 5 perlawanan. Diberi mereka telah menjaringkan dua kali lebih banyak gol dalam Perlawanan V berbanding dengan Perlawanan I, berapa gol telah dijaringkan dalam Perlawanan III?

A 3
B 4
C 6
D 10

30. Diagram 30 is a pie chart showing the travelling expenses of Ahmad and his family on a holiday in Langkawi.
Rajah 30 ialah carta pai yang menunjukkan perbelanjaan Ahmad dan keluarganya semasa bercuti di Langkawi.

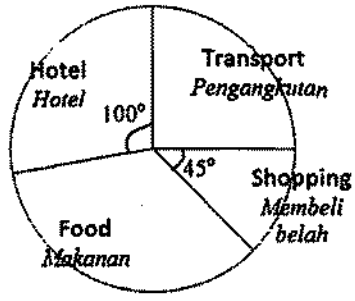


Diagram 30
Rajah 30

Ahmad spent RM1200 on hotel rooms and RM1080 on transport. Calculate the angle of the sector which represents food.
Ahmad membelanjakan RM1200 untuk bilik hotel dan RM1080 untuk pengangkutan. Kirakan sudut sektor yang mewakili makanan.

A 85°
B 90°
C 115°
D 125°

31. Diagram 31 shows a straight line PQ on a Cartesian plane.
Rajah 31 menunjukkan garis lurus PQ di atas satah Cartesan.

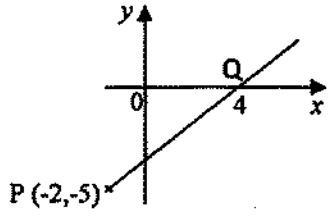


Diagram 34
Rajah 34

The gradient of PQ is
Kecerunan PQ ialah

A $\frac{2}{9}$
B $\frac{9}{2}$
C $\frac{5}{6}$
D $\frac{6}{5}$

32. Diagram 32 is a Venn Diagram which shows the elements in sets P, Q and R.
Rajah 32 ialah Gambarajah Venn yang menunjukkan unsur-unsur dalam set P, set Q dan set R.

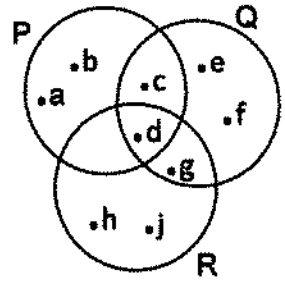
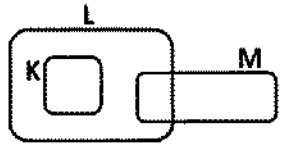


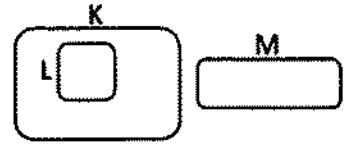
Diagram 32
Rajah 32

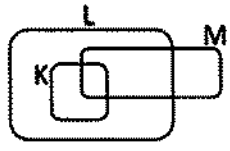
Given that $\xi = P \cup Q \cup R$, list the elements of Q'
Diberi $\xi = P \cup Q \cup R$, *senaraikan unsur-unsur dalam* Q'

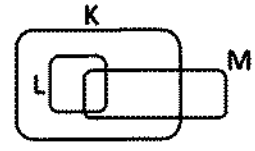
A $\{c,d,g\}$
B $\{a,b,h,j\}$
C $\{c,d,e,f,g\}$
D $\{a,b,c,d,g,h,j\}$

33. Given the universal set $\xi = K \cup L \cup M$, which of the following Venn Diegrams represents $K \subset L$, $L \cap M \neq \phi$ and $K \cap M = \phi$.
Diberi set semesta $\xi = K \cup L \cup M$, *yang manakah Gambarajah Venn yang mewakili* $K \subset L$, $L \cap M \neq \phi$ *dan* $K \cap M = \phi$.

A 

C 

B 

D 

34. Diagram 34 is a Venn Diagram showing the sets P, Q and R.
Rajah 34 ialah Gambarajah Venn yang menunjukkan set P, set Q dan set R.

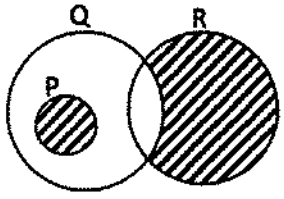


Diagram 33
Rajah 33

The shaded region is represented by
Kawasan berlorek diwakili oleh

A $(P \cap Q) \cup R$
B $(P \cup Q) \cap R$
C $P \cup (Q' \cap R)$
D $P \cap (Q \cap R')$

35. It is given that $P = \{5,6\}$ and $Q = \{7,8\}$. A number was chosen at random, from aach set P and set Q. The sample space is
Diberi bahawa $P = \{5,6\}$ dan $Q = \{7,8\}$. Satu nombor dipilih secara rawak, daripada setiap set P dan set Q. Ruang sampel ialah

A $\{(5,6),(5,7),(5,8),(6,7),(6,8),(7,8)\}$
B $\{(5,7),(5,8),(6,7),(6,8)\}$
C $\{(5,7),(6,8)\}$
D $\{5,6,7,8\}$

36. There are 30 red watermelons and some yellow watermelons in a basket. The probability that a customer chooses a yellow watermelon at random is $\frac{2}{5}$. How many yallow watermelons are in the basket?
Terdapat 30 biji tembikai merah dan beberapa biji tembikai kuning dalam sebuah bakul. Kebarangkalian seorang pelanggan memilih sebiji tembikai kuning secara rawak ialah $\frac{2}{5}$. Berapa biji tembikai kuning ada di dalam bakul itu?

A 12
B 20
C 45
D 75

37. Given that n varies inversely as the square of m end that $m = 4$ when $n = 2$. Find n in terms of m.
Diberi bahawa n berubah secara songsang dengan kuasa dua m, dan m = 4 apabila n = 2. Cari n dalam sebutan m.

A $n = \frac{1}{\sqrt{m}}$ C $n = \frac{8}{m^2}$

B $n = \frac{4}{\sqrt{m}}$ D $n = \frac{32}{m^2}$

38. Table 38 shows some values of the variables p, q and r
Jadual 38 menunjukkan beberapa nilai bagi pembolehubah p, q dan r.

p	4	10
q	6	3
r	3	m

Table 38
Jadual 38

It is given that p varies directly with q and inversely with r. Find the value of m.
Diberi bahawa p berubah secara langsung dengan q dan secara songsang dengan r. Cari nilai m.

A $\frac{12}{5}$ C $\frac{5}{3}$

B $\frac{5}{27}$ D $\frac{3}{5}$

39. $\begin{pmatrix}1\\5\end{pmatrix}+\frac{1}{2}\begin{pmatrix}8\\-2\end{pmatrix}-\begin{pmatrix}5\\-3\end{pmatrix}=$

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

B $\begin{pmatrix}0\\6\end{pmatrix}$ D $\begin{pmatrix}4\\-2\end{pmatrix}$

40. Given $\begin{pmatrix} 3 \\ 2p \end{pmatrix}\begin{pmatrix} -4 & 3 \end{pmatrix} = \begin{pmatrix} -12 & 9 \\ 16 & -12 \end{pmatrix}$, find the value of p.

Diberi $\begin{pmatrix} 3 \\ 2p \end{pmatrix}\begin{pmatrix} -4 & 3 \end{pmatrix} = \begin{pmatrix} -12 & 9 \\ 16 & -12 \end{pmatrix}$, *cari nilai p.*

A 6
B 2
C -2
D -6

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of **40** questions.
   *Kertas ini mengandungi **40** soalan.*
2. Answer **all** questions.
   *Jawab **semua** soalan.*
3. Answer each question by blackening the correct space on the objective sheet.
   Jawab setiap soalan dengan menghitamkan ruangan yang betul pada kertas jawapan objektif.
4. Blacken only **one** space for each question.
   *Hitamkan **satu** ruangan sahaja bagi setiap soalan.*
5. If you wish to change your answer, erase the blackened mark that you have done. Then blacken the space for the new answer.
   Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.
6. The diagram in the questions provided are not drawn to scale unless stated.
   Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. You may use a non-programmable scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

NAMA: .....

NO. KAD PENGENALAN | | | | | | | | | | | | | | |

1449/2
MATHEMATICS (P)
Kertas 2
SEPT 2011

$2\frac{1}{2}$ jam

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

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

2 *Kertas saalan ini adalah dalam dwibahasa .*

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

4 *Calan dibenarkan menjawab keseluruhan atau sebahagian saalan sama ada dalam bahasa Inggeris atau bahasa Melayu.*

5 *Calan dikehendaki membaca maklumat di halaman belakang kertas saalan ini .*

Untuk Kegunaan Pemeriksa

Kod Pemeriksa :

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

Kertas soalan ini mengandungi 31 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 Midpaint / *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 Pythagaras Theorem
Tearem Pithagaras
$c^2 = a^2 + b^2$

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

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

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

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

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

SHAPES AND SPACE
BENTUK DAN RUANG

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

Luas trapezium $= \frac{1}{2} \times$ *hasil tambah dua sisi selari* $\times$ *tinggi*

2 Circumference of circle $= \pi d = 2 \pi r$
Lilitan bulatan $= \pi d = 2 \pi j$

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

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

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

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

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

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

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

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

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

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

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

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

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*]

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

1 The Venn diagrams in the answer space shows sets P, Q and R such that tha universal set, $\xi = P \cup Q \cup R$.
On the diagrams in the answer space, shade the set

Gambar rajah Venn di ruang jawapan menunjukkan sat P, set Q dan set R dengan keadaan sat semasta, $\xi = P \cup Q \cup R$.

Pada rajah di ruang jawapan, lorek set

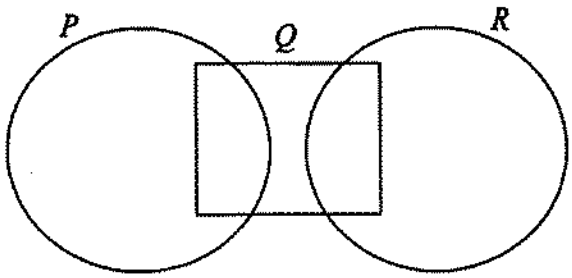
(a) $P' \cap R'$,

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

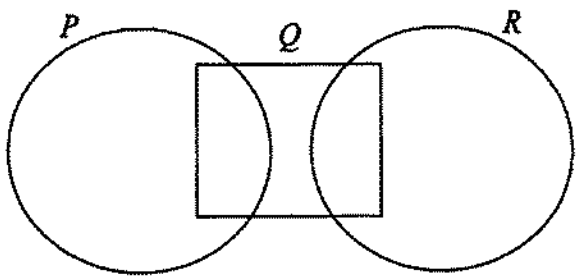
[3 *marks*]
[3 *markah*]

Answer / *Jawapan* :

(a)



(b)



2 Diagram 2 shows a composite solid formed by the combination of a hemisphere and a cone. The diameter of a hemisphere and a cone is 14 cm. The volume of a combinad solid is 1232 cm^3

Rajah 2 menunjukkan sabuah gebungan pepejal yang dibentuk daripada gabungan sebuah hemisfera dan sebuah kon. Diamatar hemisfara dan kon itu ialah 14 cm. Isipadu gabungan pepejal itu ialah 1232 cm^3

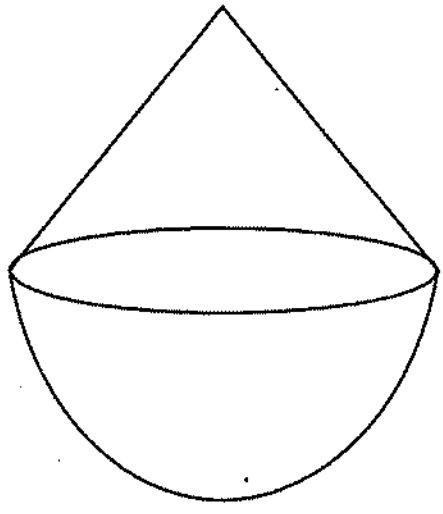


Diagram 2
Rajah 2

Using $\pi = \frac{22}{7}$, calculate the height of the cone .

Dengan menggunakan $\pi = \frac{22}{7}$, *hitung tinggi kon itu.*

[4 msrks]
[4 *markah*]

Answer / *Jawapan* :

For Examiner's use

3. Diagram 3 shows a right prism. The right angled triangle *PQR* is the uniform cross-section of the prism.
Rajah 3 menunjukkan sebuah prisma tegak. Segitiga bersudut tegak PQR ialah keratan rentas seragam prisma itu

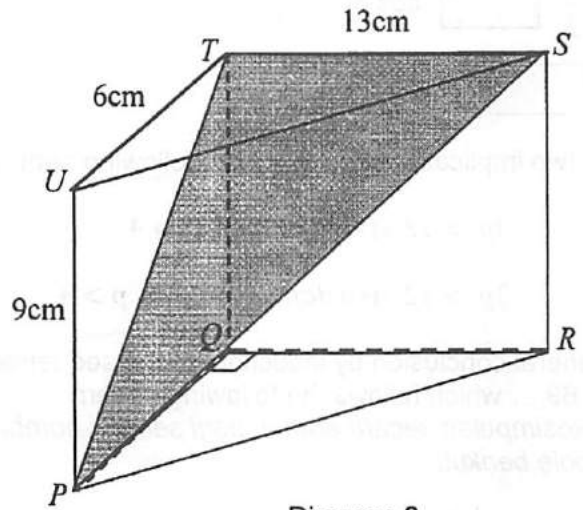


Diagram 3
Rajah 3

(a) State the angle between the plane *PST* and the base *PQR*
Nyatakan sudut antara satah PST dengan tapak PQR.

(b) Hence, calculate the angle between the plane *PST* and the base *PQR*
Seterusnya, hitung sudut antara satah PST dan tapak PQR.

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

Answer / *Jawapan* :

(*a*)

(*b*)

4 (e) Complete tha box below with the word `and' or ` or' to make a true statement.
Lengkapkan petak kosong di bawah dangan perkataan `dan` atau`atau` supaya membina satu pernyataan yang benar

i) $\sin 30° = \frac{1}{2}$ ☐ $\cos 60° = \frac{1}{2}$

ii) $3^2 = 6$ ☐ $2^3 = 8$

(b) Writa down two implications based on tha following sentence :

$3p > 12$ *if and only if* $p > 4$

$3p > 12$ *jika dan hanya jika* $p > 4$

(c) Maka a ganeral conclusion by induction for tha sequence of numbers 15, 29, 47, 69,... which follows the following pattarn
Buat satu kesimpulan sacara aruhan bagi senarai nombor 15, 29, 47, 69,... mengikut pola berikut:

$15 = 2(3)^2 - 3$
$29 = 2(4)^2 - 3$
$30 = 2(5)^2 - 3$
$69 = 2(6)^2 - 3$
..... =.....

[5 marks]
[5 *markah*]

Answer/*Jawapan* :

(a) (i)

(ii)

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

Implication 2 / Implikasi 2: .....

(c) .....

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

$$x - 2y = 8$$
$$\frac{1}{3}x + 4y = -2$$

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

Answer / *Jawapan* :

For Examiner's use

6. In Diagram 6, O is the origin. The straight line OS is parallel to the straight line RQ and PQ is parallel to the x-axis.
Dalam Rajah 6, O ialah asalan. Garis lurus OS adalah selari dengan garis lurus RQ dan PQ adalah salari dangan paksi-x.

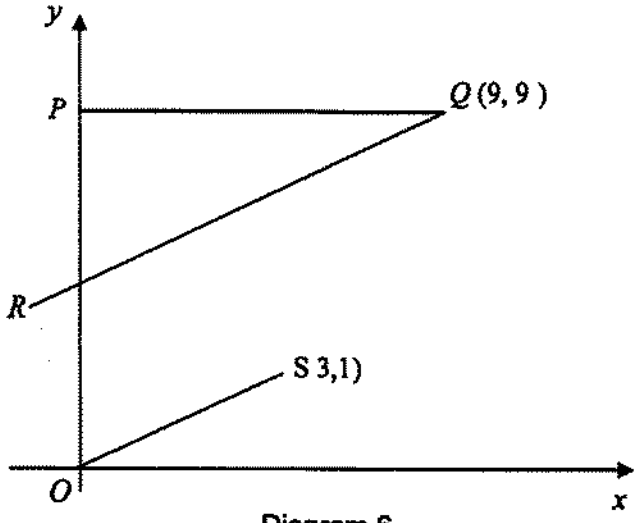


Diagram 6
Rajah 6

(*a*) Stata the equation of the straight line PQ,
Nyatakan persamaan gan's lurus PQ,

(*b*) Find the equation of straight line RQ and hence state its *x*-Intercept
Cari persamaan garis lurus *RQ* dan seterusnya nyatakan *pintasan - x begi gen's lurus itu.*

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

Answer / *Jawapan* :
(*a*)

(*b*)

For Examiner's use

7 Solve the following quadratic equation:
Selesaikan persamean kuedratik berikut:

$$\frac{2y^2 + 6}{7} + y = 3$$

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

Answer / *Jawapan*

For Examiner's use

8. (a) Given that $\frac{1}{p}\begin{pmatrix} -3 & -2 \\ -4 & 1 \end{pmatrix}\begin{pmatrix} q & 2 \\ 4 & -3 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$,

find the values of p and of q

Diberi $\frac{1}{p}\begin{pmatrix} -3 & -2 \\ -4 & 1 \end{pmatrix}\begin{pmatrix} q & 2 \\ 4 & -3 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, *cari nilai p dan nilai q.*

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

$$x + 2y = 1$$
$$4x - 3y = -18$$

Hence, using the matrix method, calculate the values of x and of y.
Seterusnya, dengan menggunakan kaedah matriks, hitung nilai x dan nilai y.

[6 marks]
[6 markah]

Answer / *Jawapan* :

(*a*)

(*b*)

For Examiner's use

9 In Diagram 9, POQ is a sector of a circle with centre O and OQS is a quadrant of circle with centre O.
Dalam Rajah 9, POQ ialah sector kepada bulatan berpusat O dan OQS ialah sebuah sukuan bulatan berpusat O.

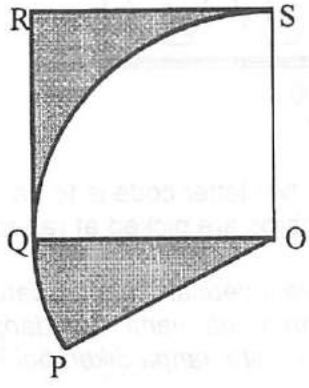


Diagram 9
Rajah 9

It is given that $OP = 14$ cm and $\angle POQ = 30°$.
Diberi bahawa $OP = 14$ cm dan $\angle POQ = 30°$.

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

Menggunakan $\pi = \frac{22}{7}$, *hitung*

(*a*) the area, in cm^2, of the coloured regions.
luas, dalam cm^2, kawasan yang berwarna,

(*b*) the perimeter, in cm, of the coloured regions.
perimeter, dalam cm, *kawasan yang berwarna,*

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

Answer / *Jawapan* :

For Examiner's use

10 Diagram 10 shows five cards labelled with letters.
Rajah 10 manunjukkan lima kad yang berlabel dengan huruf.

Diagram 10
Rajah 10

All these cards are put into a box. A two lettar code is to ba formed by using any two of these cards. Two cards are picked at random, one after another, without replacement.
Kasemua kad ini dimasukkan ka dalam sebuah kotak. Suatu kod dua huruf hendak dibentuk menggunakan mana-mana dua daripada kad ini. Dua kad dipilih secara rawak, satu persatu, tanpa dikambalikan.

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

(b) List all the outcomes of the avents and find tha probability that
Senaraikan semua kesudahan peristiwa dan cari kabarangkalian bahawa

(i) tha code begins with a vowel
kod itu bermula dangan vokal

(ii) tha coda consist of two consonants or begin with a vowel
kod itu mangandungi dua huruf konsonan atau bermula dangan huruf vokal.

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

Answer / *Jawapan*:

(a)

(b) (i)

(ii)

For Examiner's use

11.

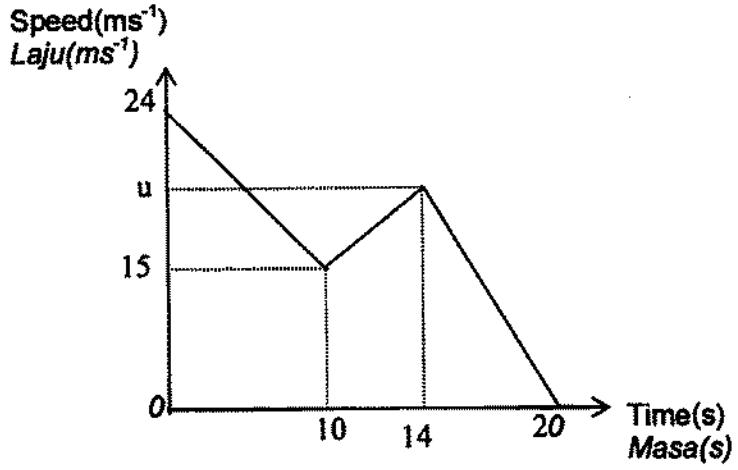


DIAGRAM 11
RAJAH 11

Diagram 11 shows a speed-time graph of a particle for a period of 20 seconds.
Rajah 11 menunjukkan graf laju-masa bagi suatu zarah dalam tempoh 20 saat.
Calculate / *Hitungkan* :

(e) Tha rate of change of speed in tha first 10 s.
Kadar perubahan laju dalam tempoh 10 s yeng partama.

(b) The value of u if the distance travelled by the particle in the last 10s is 130m
Nilai u, jika jarak yang dilalui dalam masa 10s yang akhir ialah 130m.

[5 marks]
[5 markah]

Answer/Jawapan:

(a)

(b)

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

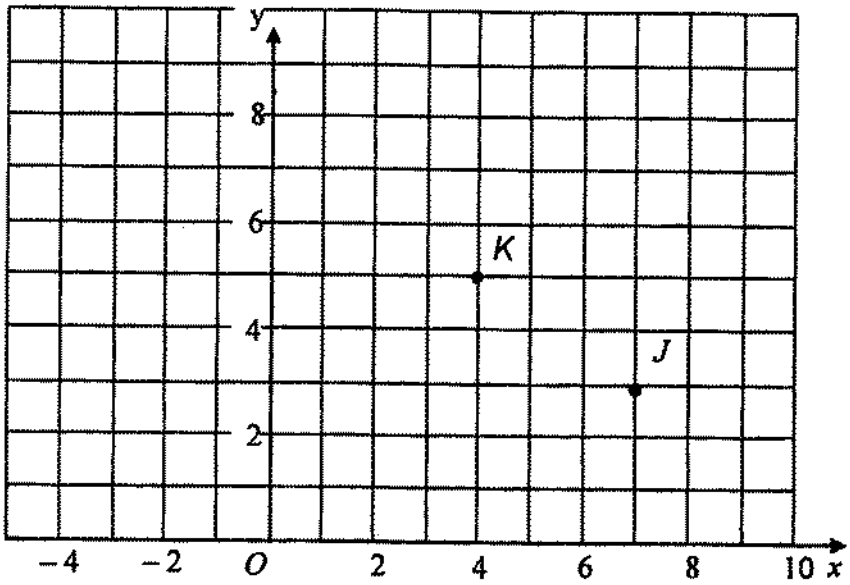


Diagram 12.1
Rajah 12.1

a) Transformation **P** is a reflection in the lina $y = 5$.
Transformation **R** is a anticlockwise rotation of 90° about tha cantra K.
Transformation **T** is translation $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$.

Panjelmaan **P** *ialah pantulan pada gan's lurus* $y = 5$.
Penjalmaan **R** *ialah putaran* 90° *ikut arah lawan jam pada pusat* K
Panjelmaan **T** *ialah translasi* $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$.

Find the coordinates of the image of point J under the following combined transformation:
Can koordinat imaj bagi titik J *di bawah gabungan penjelmaan berikut* :

(i) **P**
(ii) **RP**.
(iii) **RT**

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

For Examiner's use

(c) Diagram 12.2 shows two pentagons, ABCDE and JKLMA drawn on a square grid.
Rajah 12.2 menunjukkan dua pentagon, ABCDE dan JKLMA dilukis pada grid segiempat sama.

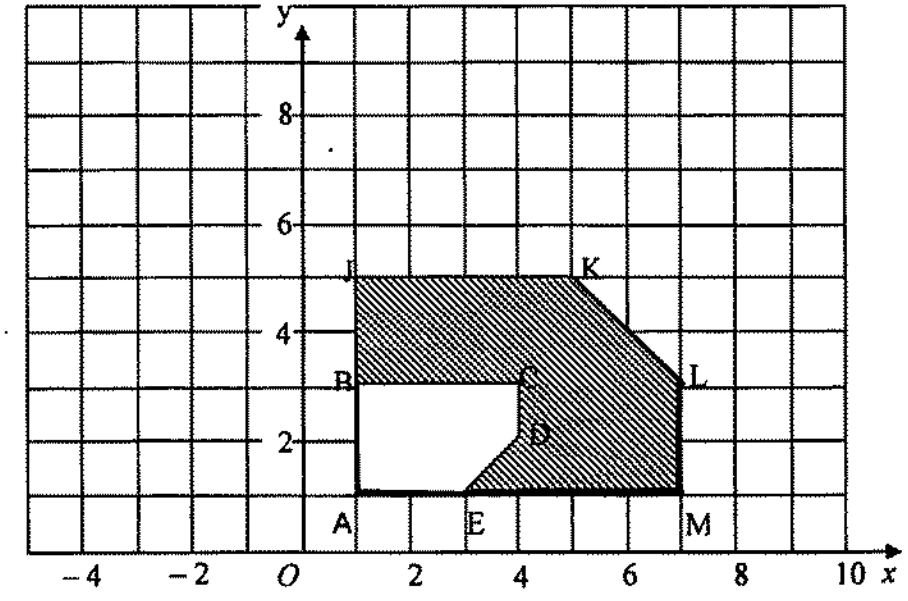


Diagram 12.2
Rajah 12.2

(i) *JKLMA* is the image of *ABCDE* under a combined transformations **WV**
JKLMA ialah imaj bagi ABCDE di bawah gabungan penjelmaan **WV**

Describe in full, the transformation:
Huraikan selangkapnya, penjelmaan:
(a) **V**
(b) **W**

(ii) It is given that *ABCDE* represents a region of area 18 m^2.
Calculate the area, in m^2, of the region represented by shaded region.
Diberi bahawa ABCDE mewakili suatu kawasan yang mempunyai luas 18 m^2,
Hitung luas, dalam m^2, *kawasan yang diwakili oleh kawasan yang berlorek.*

[8 marks]
[8 markah]

For Examiner's use

Answer/ *Jawapan* :

(*a*) (i)

(ii)

(iii)

(*b*) (i) (*a*)

(*b*)

(ii)

For Examiner's use

13 (a) Complete Table 1 in the answer space for the equation $y = \frac{-20}{x}$ by writing down the values of y when $x = -3$ and $x = 1.5$.

[2 marks]

Lengkapkan Jadual 1 di ruang jawapan bagi persamaan $y = \frac{-20}{x}$ *dengan menulis nilai-nilai* y *apabila* $x = -3$ *dan* $x = 1.5$.

[2 markah]

(b) For this part of the question, use the graph paper provided on page 21. You may use a flexible curve ruler.
Untuk ceraian soalan ini, gunakan kertas graf yang disediakan pada halaman 21. Anda bolah menggunakan pembaris flaksibal.

By using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 unit on the y-axis, draw the graph of $y = \frac{-20}{x}$ for $-4 \le x \le 4$.

[4 marks]

Dengan manggunakan skala 2cm *kepada* 1 *unit pada paksi-x dan* 2cm *kapade* 5 *unit pada paksi-y, lukis graph* $y = \frac{-20}{x}$ *bagi* $-4 \le x \le 4$.

[4 markah]

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

(i) the value of y when $x = 1.8$,
nilai y *apabila* $x = 1.8$

(ii) the value of x when $y = 14$.
nilai x *apabila* $y = 14$

[2 marks]
[2 markah]

(d) Draw a suitable straight line on your graph to find all the values of x which satisfy the equation $3x^2 - 2x = 20$ for $-4 \le x \le 4$.
State these values of x. [4 marks]
Lukiskan satu garis lurus yang sesuai pada graf anda untuk mancari semua nilai x *yang mamuaskan persamaan* $3x^2 - 2x = 20$ *bagi* $-4 \le x \le 4$.
Nyatakan nilai-nilai x *itu*. [4 markah]

Answer / *Jawapan* :

For Examiner's use

(a)

x	– 4	–3	–2	–1	1	1.5	2	3	4
y	5		10	20	– 20		-10	-6.67	–5

Table 1
Jadual 1

(b) Refer graph on page 21.
Rujuk graf di halaman 21.

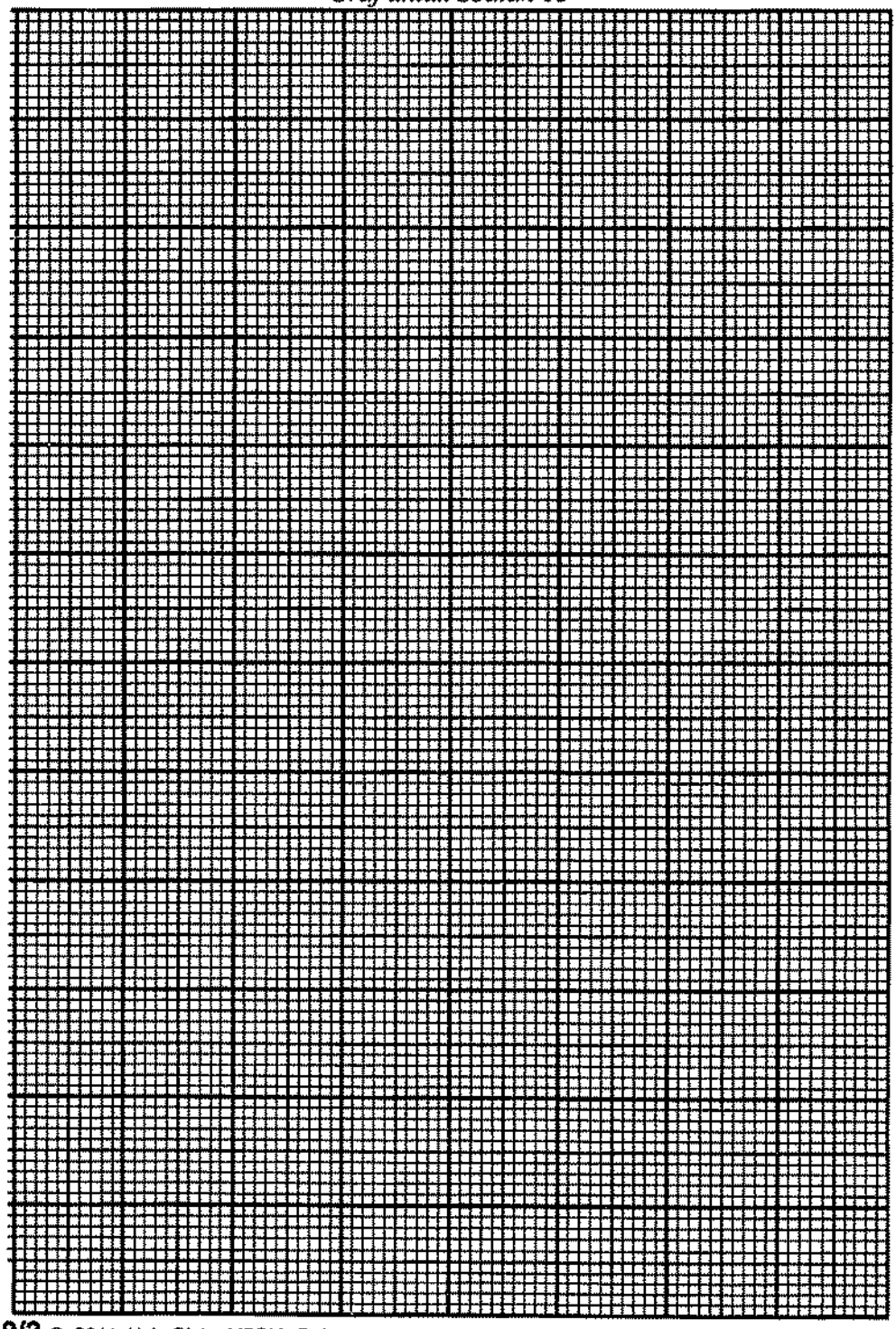
(c) (i) y = ...

(ii) x = ...

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

Graph for Question 13
Graf untuk Soalan 13

For Examiner's



14 The data in the Diagram 14 shows the money spent by 60 students in a week.
Data dalam Rajah 14 menunjukkan jumlah wang yang dibelanjakan oleh 60 orang pelajar dalam seminggu

25	43	32	25	43	27	43	29	37	42	15	32	26	28	22
31	21	41	34	23	31	21	36	28	43	47	44	33	25	18
28	44	27	17	43	21	48	32	24	27	43	25	26	38	49
35	37	23	31	46	30	29	33	39	43	34	40	47	39	26

Diagram 14
Rajah 14

(a) Based on the data in Diagram 14 and by using a class interval of 5, complete Table 2 in the answer space [4 marks]
Berdasarkan data di rajah 14 dan dengan mengunakan selang kelas 5 lengkapkan Jadual 2 di ruang jawapan [4 *markah*]

(b) State the modal class [1 mark]
Nyatakan kalas mod [1 *markah*]

(c) Based on Table 2, calculate the astimate mean of the money spent by a student. . [3 marks]
Bardasarkan Jadual 2, hitungkan min anggaran wang yang digunakan olah seorang murid [3 *markah*]

(d) For this part of the question, use the graph paper provided in page 24
Untuk ceraian soalan ini , gunakan kertas graf yang disediakan pada halaman 24

By using a scale of 2 cm to RM 5 on the *x*- axis and 2 cm to 2 students on tha *y*- axis, draw a histogram for the data. [3 marks]
Dangan menggunakan skala 2 cm kapeda RM 5 pada paksi -x dan 2 cm mewakili 2 orang murid pada paksi -y, lukiskan satu histogram bagi data tersebut. [3 *markah*]

(e) State one information based on the histogram in 14(d) [1 merks]
Nyatakan satu maklumat berdasarkan histogram di 14(d) [1 *markah*]

For Examiner's use

Answer/ *Jawapan* :

(a)

Money spent (RM)	Frequency	Midpoint
15 - 19		

TABLE 2
JADUAL 2

(b)

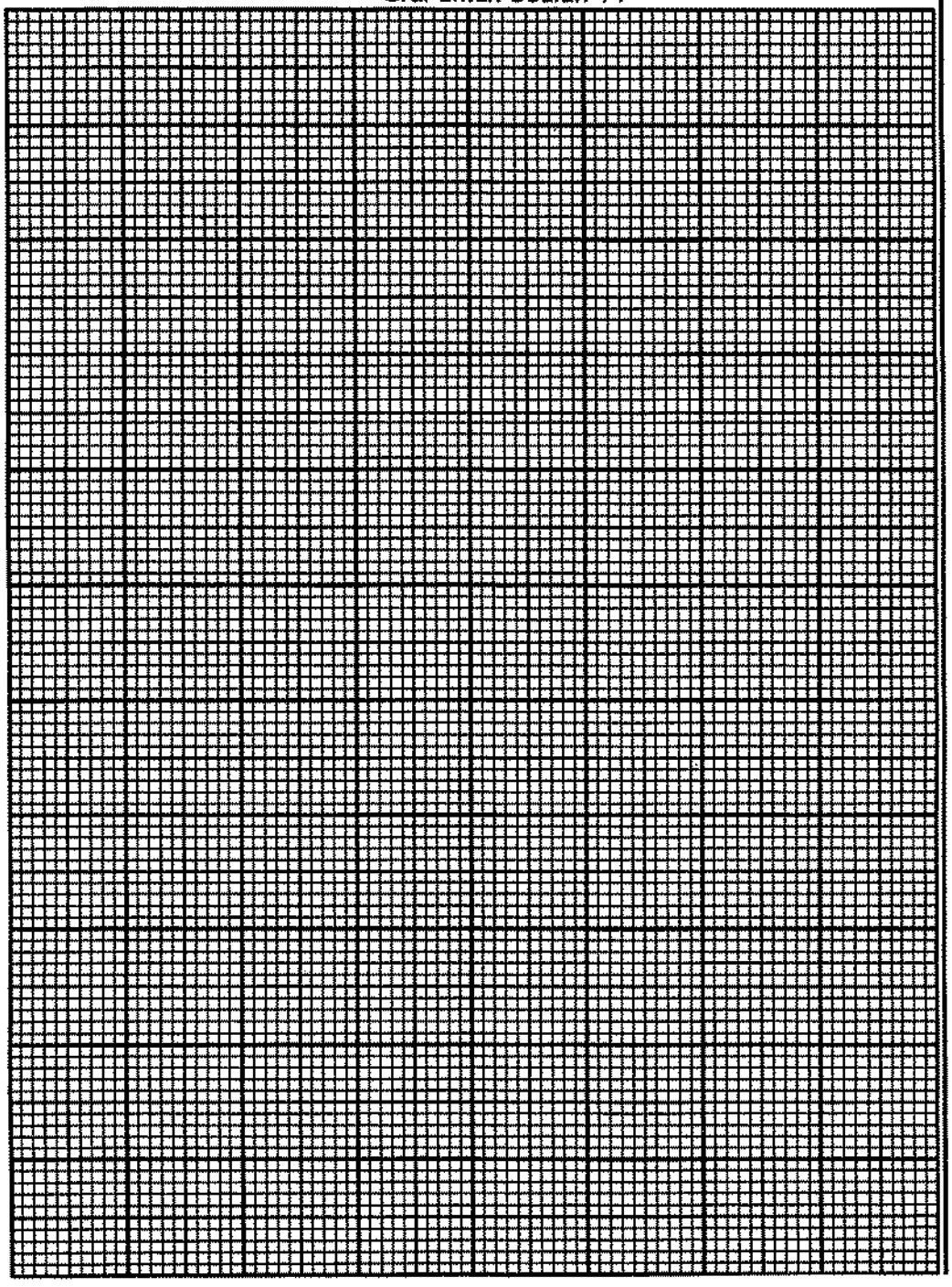
(c)

(d) Refer graph on page 24
Rujuk graf di halaman 24

(e)

Graph for Question 14

Graf untuk Soalan 14



For Examiner's use

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

Diagram 15(i) shows a combined solid cuboid with a half cylinder on a horizontal plana.The surface PQRST is the uniform cross-section of the solid.

Rajah 15(i) *menunjukkan sebuah gabungan pepajal barbentuk kuboid dengan separuh silindar terletek di atas satah* mengufuk. *Permukaen PQRST ialah karatan rantas saragam pepajal itu.*

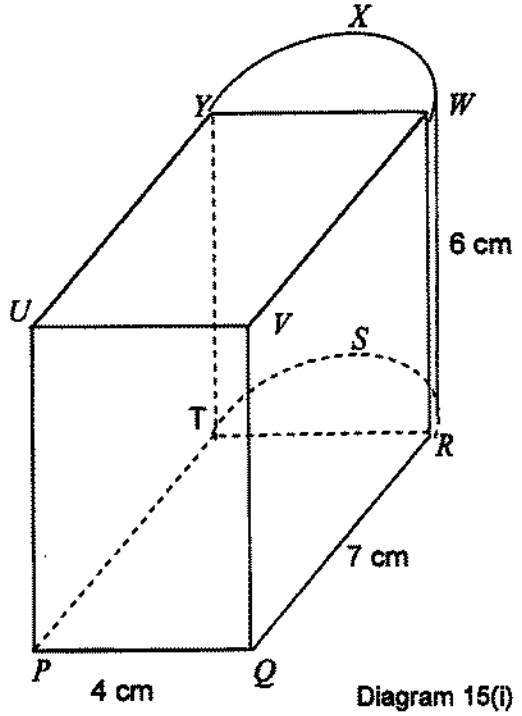


Diagram 15(i)
Rajah 15(i)

Draw to full scala, the plan of the solid.

[3 marks]

Lukis dangan skala penuh, pelan pepejel itu.

[3 *markah*]

Answer /*Jawapan :*

(a)

For Examiner's use

15 (b) Another solid right trapezium with rectangular base *ABTP* is joined to the prism in Diegram 15(i) at the vertical plane *PTYU*

Sebuah pepejal berbentuk trapezium tegak dnegen tepak ABTP di cantumken kapada prisme pada Rajah 15(i) *pade seteh mencencang PTYU.*

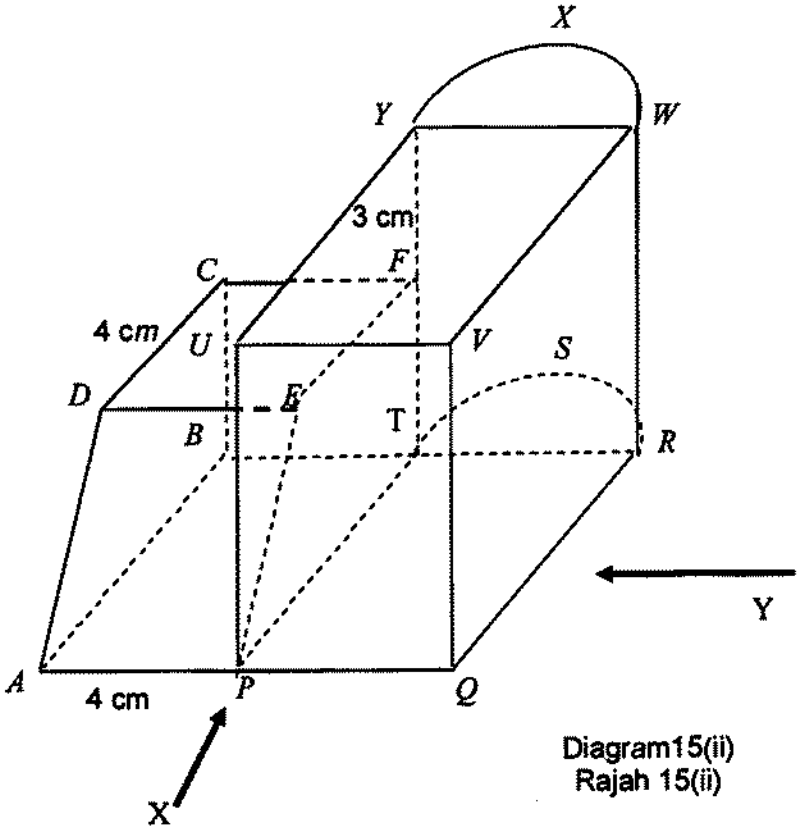


Diagram15(ii)
Rajah 15(ii)

Draw to full scale,
Lukiskan dengan skala penuh,

(i) the elavation of tha combined solid on a vertical plane parallel to AQ as viewed from x [4 *marks*
dongekan gabungan pepejel itu pade setah mencancang yang seleri dengan AQ sebegaimena dilihet dari x [4 *markeh*]

(ii) the elevation of the combined solid on *a* vertical plane perallel to *QR* as viewed from *Y*, [5 *marks*]
dongakan gebungan pepejal itu pada satah mencanceng yang seleri dangan QR sebagaimene dilihet dari Y, [5 *merkeh*]

Answer /Jawapan :

(b) (i) (ii)

For Examiner's use

16. X(*60* °N,*155*° W) *and* Y are two points *on tha* surface of the earth with XY being the diameter of common parallel of latitude.

X(60° U,155° B) dan Y ialah dua titik pada permukaan Bumi dengan keadaan XY ialah diameter selarian latitud sepunya.

(a) Stata the lo*n*gitude of *Y*. [2marks]
Nyatakan longitud bagi titik Y. [2 markah]

(b) *Given XZ* is the diameter of the earth. I*n* the answer space, show the locatio*n* of poi*n*t *Z*. Ha*n*ce, state the locatio*n* of poi*n*t *Z*.
[3 marks]
Diberi XZ ialah diametar bumi. Pada rajah di ruang jawapan, tandakan kedudukan titik Z. Seterusnya nyatakan kedudukan titik Z
[3 markah]

(c) Calculete the shortest distan*c*e, in nautical mila, from X to Y
[3 marks]
Hitung jarak terpendek, dalam batu nautika, dari X ka Y
[3 m*arkah*]

(d) An aeroplane took off from X a*n*d flew due west to P with everega speed of 650 knots. The time taken for the flight is 6 hours to reach P

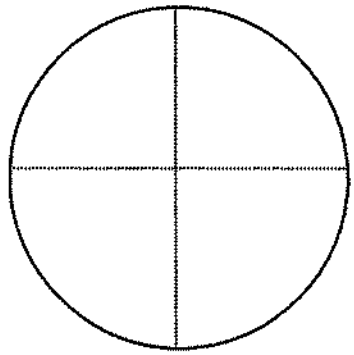
Calculate the distance, in nautical mile, from X to P, hence state the lo*n*gituda of P
[5 marks]

Sabuah kapal tarbang berlepas dari X dan tarbang ke barat dengan purata leju 650 knot. Kapal terbang itu mangambil 6 jam untuk sampai ke P.
Hitung jarak, dalam batu nautika, dari X ka P, seterusnya nyatakan longitud titik P
[5 *markah*]

16 Answer / *Jawapan* :

(*a*)

(*b*)



(*c*)

(*d*) (i)

(ii)

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

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

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

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

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

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

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

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

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

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

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

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

1449/1(PP)
MATHEMATICS
Kertas 1
Sept 2011
Peraturan
Pemarkahan

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGA NEGERI PAHANG

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011

MATHEMATICS

Kertas 1

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

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

END OF MARKING SCHEME
PERATURAN PEMARKAHAN TAMAT

1449/2(PP)
Mathematics
Kertas 2
Sept 2011
Peraturan
Pemarkahan

MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGA NEGERI PAHANG

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011

MATHEMATICS

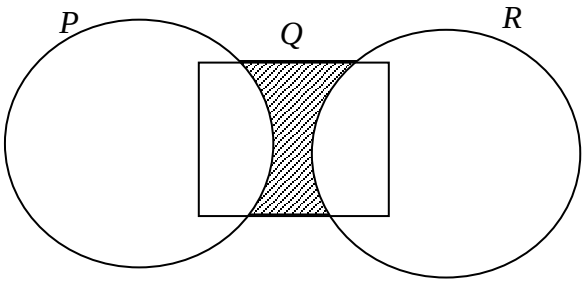
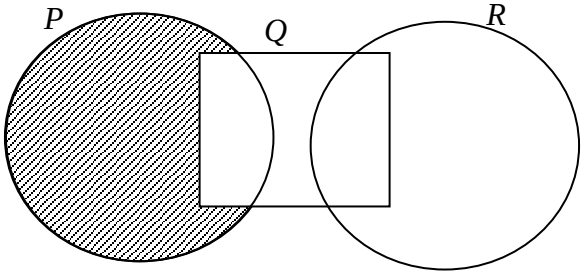
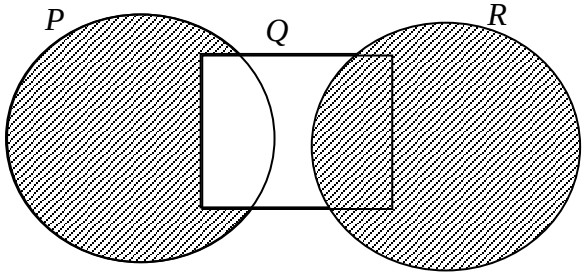
Kertas 2

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 13 halaman bercetak

SECTION A [52 MARKS]

Question			Solution and Marking Criteria	Marks	
1	(a)			K1	3
	(b)		 Note: If $'Q' \cup R$ correctly shaded, award K1 	K2	
2			$\frac{2}{3}, \frac{22}{7}, 7, 7, 7$ $\frac{1}{3}, \frac{22}{7}, 7, 7, h$ $\frac{2}{3}, \frac{22}{7}, 7, 7, 7 + \frac{1}{3}, \frac{22}{7}, 7, 7, h = 1232$ $h = 10\,\text{cm}$	K1 K1 K1 N1	4
3			$\angle TPQ$ *or* $\angle QPT$ $\tan q = \frac{9}{6}$ *or* equivalent 56.31^{o} *or* $56^{o}\,19¢$	P1 K1 N1	3

4	(a)	(i)	And	P1	6
		(ii)	Or	P1	
	(b)		If $3p > 12$, then $p > 4$ If $p > 4$, then $3p > 12$	P1 P1	
	(c)		$2n^3 - 3$ where $n = 3, 4, 5, 6, \ldots$ Note: $2n^3 - 3$ only $2n^3 - 3$ $n = 3, 4, 5, \ldots$ $2n^3 - 3$ $n = 1, 2, 3, 4, \ldots$ } award K1	K1N1	
5			$x + 12y = -6$ *or* $x = 2y + 8$ *or* equivalent Note Attempt to equate the coofficence one the unknowns, award K1 $-14y = 14$ *or* $7x = 7$ *or* equivalent **OR** $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{(1)(4) - \left(\frac{1}{3}\right)(-2)} \begin{pmatrix} 4 & 2 \\ -\frac{1}{3} & 1 \end{pmatrix} \begin{pmatrix} 8 \\ -2 \end{pmatrix}$ *or* equivalent (K2) $x = 6$ $y = -1$ Note: $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 6 \\ -1 \end{pmatrix}$ as final answer, award N1	K1 K1 N1 N1	4
6	(a)		$y = 9$	P1	6
	(b)		$9 = (\frac{1}{3})(9) + c$ *or* $y - 9 = (\frac{1}{3})(x - 9)$ *or* equivalent $y = \frac{1}{3}x + 6$ *or* equivalent $0 = (\frac{1}{3}x + 6)$ $x = -18$	K1K1 N1 K1 N1	

7			$2y^2 + 7y - 15 = 0$ $(2y - 3)(y + 5) = 0$ *or* equivalent **OR** $y = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(-3)}}{2(1)}$ __K1 $y = -5$ $y = \frac{3}{2}$ or 1.5 Note: Accept without " = 0". Accept three terms on the same side, in any order Accept $\left(y - \frac{3}{2}\right)(y+5)$ with $y = \frac{3}{2}, -5$ for Kk2 Accept $\left(y - \frac{3}{2}\right)(y+5)$ *with* $y = \frac{3}{2}, -5$ *for* Kk 2 Accept answer from three correct term without factorisation for Kk2	K1 K1 N1 N1	4
8	(a)		$p = -11$ $q = 1$ Note: $p = \frac{1}{(1)(-3) - (4)(2)}$ *or* $-\frac{1}{11}$ award P1	P2 P1	6
	(b)		$\begin{pmatrix} 1 & 2 \\ 4 & -3 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 1 \\ -18 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{(1)(-3) - (4)(2)}\begin{pmatrix} -3 & -2 \\ -4 & 1 \end{pmatrix}\begin{pmatrix} 1 \\ -18 \end{pmatrix}$ *or* $\begin{pmatrix} \text{inverse} \\ \text{matrix} \end{pmatrix}\begin{pmatrix} 1 \\ -18 \end{pmatrix}$ $x = -3$ $y = 2$	K1 K1 N1 N1	

			Note: Do not accept $\begin{pmatrix} \text{inverse} \\ \text{matrix} \end{pmatrix} = \begin{pmatrix} 1 & 2 \\ 4 & -3 \end{pmatrix}$ // $\begin{pmatrix} \text{inverse} \\ \text{matrix} \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$. $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -3 \\ -2 \end{pmatrix}$ as final answer, award N1 . Do not accept solutions solved not using matrix method.		
9	(a)		$\frac{30}{360} \times \frac{22}{7} \times 14 \times 14$ *or* $\frac{90}{360} \times \frac{22}{7} \times 14 \times 14$ $(14 \times 14)\frac{90}{360} \times \frac{22}{7} \times 14 \times 14 + \frac{30}{360} \times \frac{22}{7} \times 14 \times 14$ 93.33 cm^2	K1 K1 N1	6
	(b)		$\frac{30}{360} \times 2 \times \frac{22}{7} \times 14$ *or* $\frac{90}{360} \times 2 \times \frac{22}{7} \times 14$ $\frac{30}{360} \times 2 \times \frac{22}{7} \times 14 + \frac{90}{360} \times 2 \times \frac{22}{7} \times 14 + (14+14+14+14)$ 85.33 cm Note: Accept p for K mark. Correct answer from incomplete working, award Kk2	K1 K1 N1	
10	(a)		{MA, MT, MH, MS, AM, AT, AH, AS, TM, TA, TH, TS, HM, HA, HT, HS, SM, SA, ST, SH} Note : Two wrong listing ---award P1	P2	6
	(b)	(i)	{AM, AT, AH, AS} $= \frac{4}{20}$	K1 N1	
		(ii)	{MT, MH, MS, TM, TH, TS, AM, AT, AH, AS, HM, HT, HS, SM, ST, SH} $= \frac{16}{20}$ *or* $\frac{4}{5}$	K1 N1	
11	(a)		$\frac{24 - 15}{0 - 10}$ $= -\frac{9}{10}$	K1 N1	5

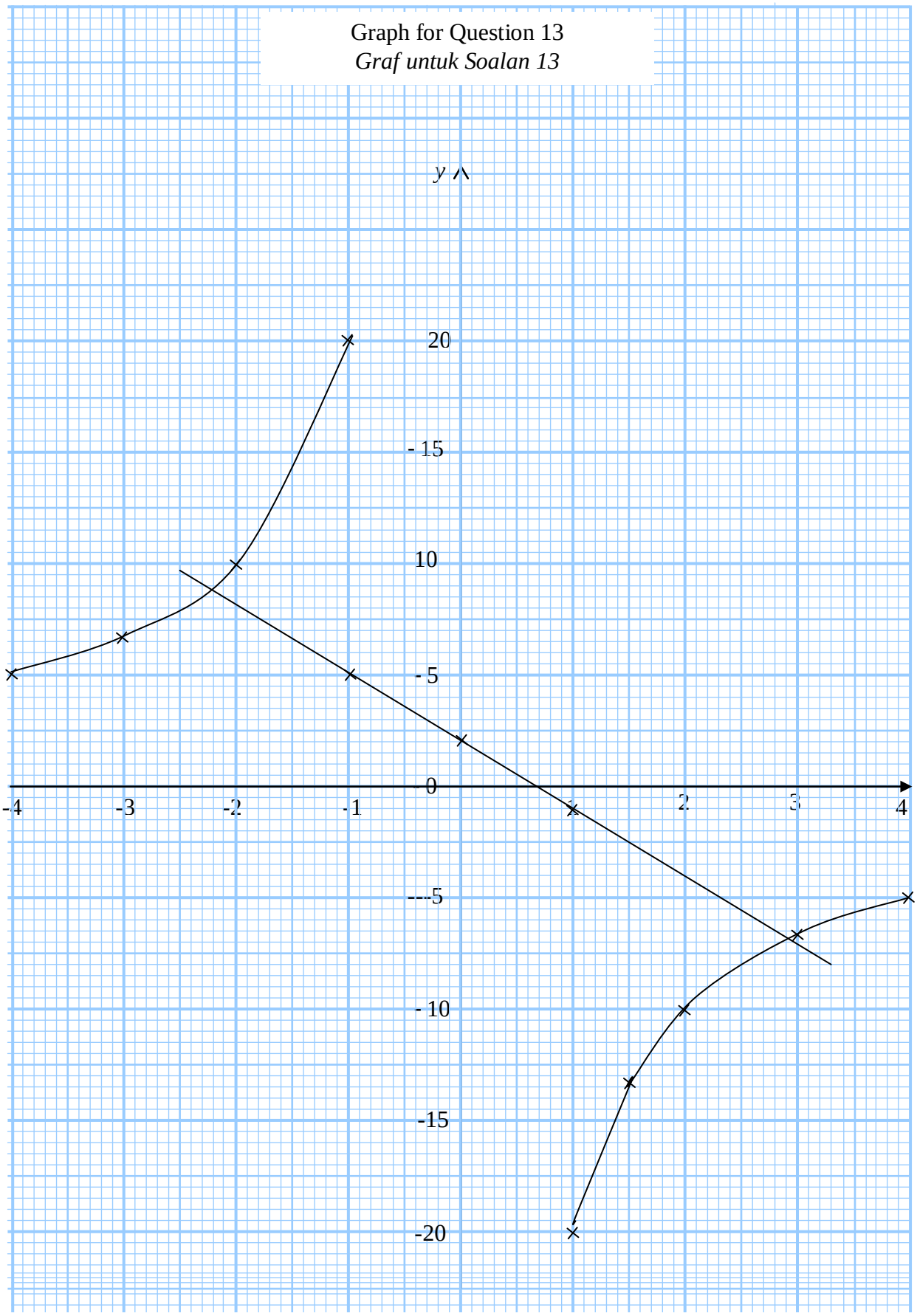
	(b)		$\frac{1}{2}(1.5+u)4+\frac{1}{2}\times u\times 6=130$ $u=20$ Note: - $\frac{1}{2}(15+u)4$ or $\frac{1}{2}\times u\times 6$ --- award K1	K2 N1	

SECTION B [48 MARKS]

Question			Solution and Marking Criteria		Marks	
12	(a)	(i)	(7, 7)		P1	12
		(ii)	(2, 8)		P1	
		(iii)	(9, 4) Note: Point (9, 4) marked or (3 , 0) seen or (3, 0) marked, award P1		P2	
	(b)	(i)	(a)	V: Reflection in the line $x=2$ Note: The word "reflection" is seen --- award P1	P2	
			(b)	W: Enlargement centre A or (1, 1) with scale factor 2 Note: P2: Enlargement centre N *or* Enlargement scale factor of $\frac{1}{2}$ P1: Enlargement	P3	
		(ii)	18×2^2 $=18\times 2^2-18$ = 54		K1 K1 N1	

13	(a)		6.67 -13.33	K1 K1	12
	(b)		Graph § Axes drawn in correct directions uniform scale for $-4 \le x \le 4$ and $-31 \le y \le 5$ § All 7 points and *2 points correctly plotted or the curve passes through the points for $-4 \le x \le 3.5$ and $-20 \le y \le 20$ § A smooth and continuous curve without any straight line and passes through all 9 correct points using the given scale for $-4 \le x \le 4$ and $-20 \le y \le 20$. Note: § 7 or 8 points correctly plotted, award K1 § Ignore curve out of range	P1 K2 N1	
	(c)	(i)	$-11.5 \le y \le -10.5$	P1	
		(ii)	$-1.5 \le x \le -1.4$ Note: § Allow P marks if values of x and of y are shown on the graph. § Values of x and y obtained by calculation, award P0 § Or from wrong graph, award P0	P1	
	(d)		Identify equation $y = -3x + 2$ *or* $3x^2 - 2x = -yx$ Straight line $y = -3x + 2$ correctly drawn Values of x : $-2.3 \le x \le -2.2,\ 2.8 \le x \le 2.9$ Note: § Allow N marks if values of x are shown on the graph § Values of x obtained by calculation, award N0	K1 K1 N1N1	

Graph for Question 13
Graf untuk Soalan 13



<table>
<tr><th colspan="3">Question</th><th>Solution and Marking Criteria</th><th>Marks</th><th></th></tr>
<tr><td>14</td><td>(a)</td><td></td><td>
<table>
<tr><th>Class interval</th><th>Frequency</th><th>Midpoint</th></tr>
<tr><td>15 – 19</td><td>3</td><td>17</td></tr>
<tr><td>20 – 24</td><td>7</td><td>22</td></tr>
<tr><td>25 – 29</td><td>15</td><td>27</td></tr>
<tr><td>30 – 34</td><td>11</td><td>32</td></tr>
<tr><td>35 – 39</td><td>7</td><td>37</td></tr>
<tr><td>40 – 44</td><td>12</td><td>42</td></tr>
<tr><td>45 – 49</td><td>5</td><td>47</td></tr>
</table>
Class Interval: (II to VII)
Frequency: (I to VII)
Midpoint: (I to VII)

<u>Note</u>: Allow one mistake in frequency for P1</td><td>P1
P2
P1</td><td rowspan="4">12</td></tr>
<tr><td></td><td>(b)</td><td></td><td>25 - 29</td><td>P1</td></tr>
<tr><td></td><td>(c)</td><td></td><td>Mean = $\frac{(3\times 17)+(7\times 22)+(15\times 27)+(11\times 32)+(7\times 37)+(12\times 42)+(5\times 47)}{3+7+15+11+7+12+5}$
= 32.67</td><td>K2

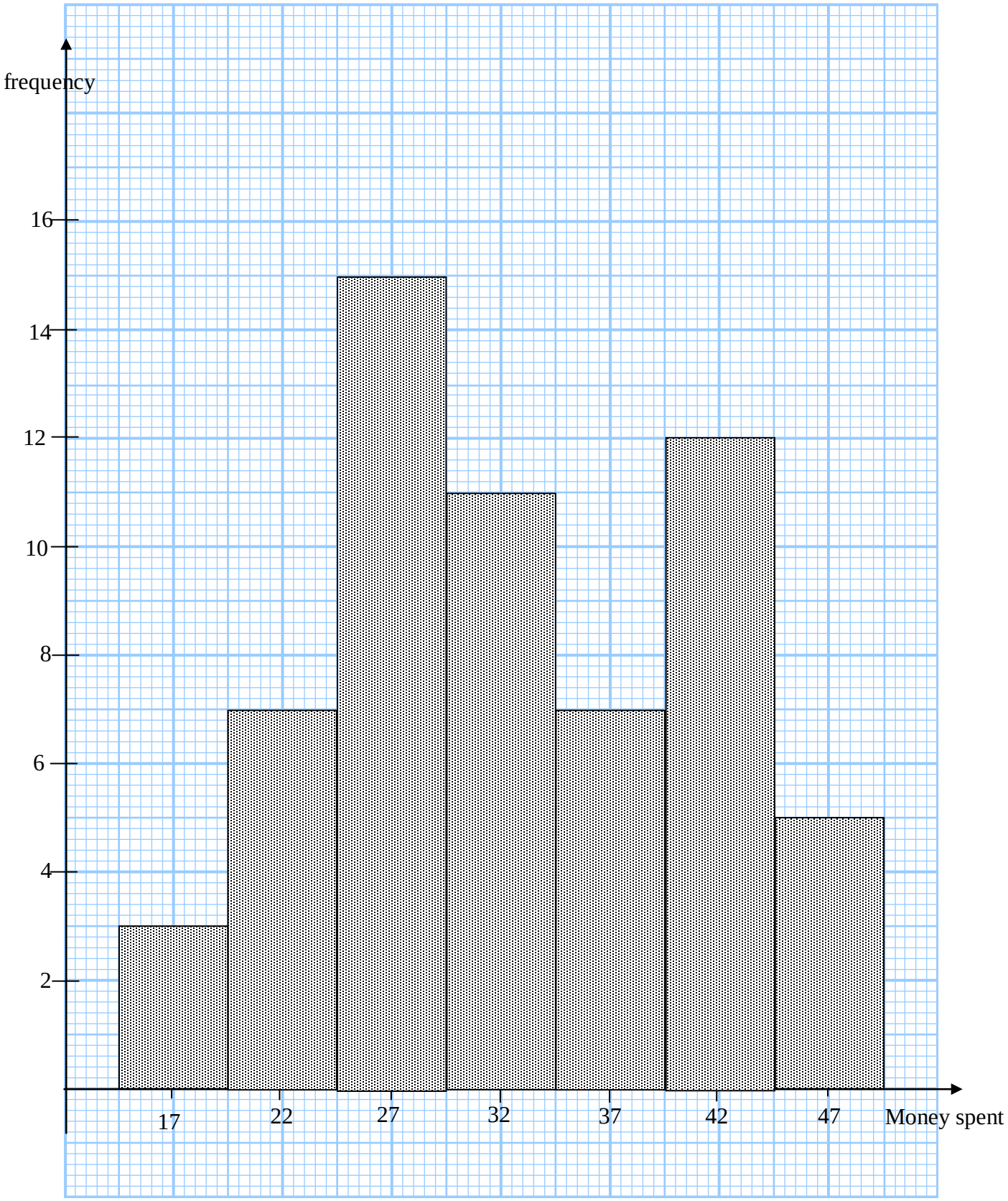
N1</td></tr>
<tr><td></td><td>(d)</td><td></td><td>Refer graph

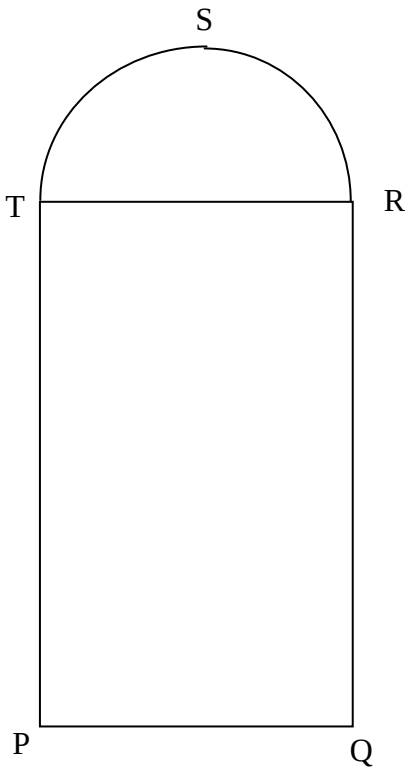
§ Axes drawn in correct direction, uniform scale for $4 \le x \le 4$ and $-20 \le y \le 20$
§ *7 bars correctly drawn

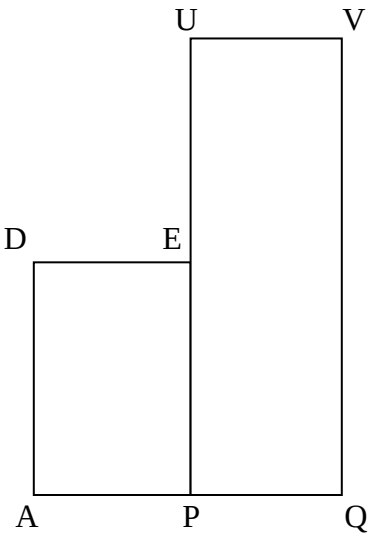
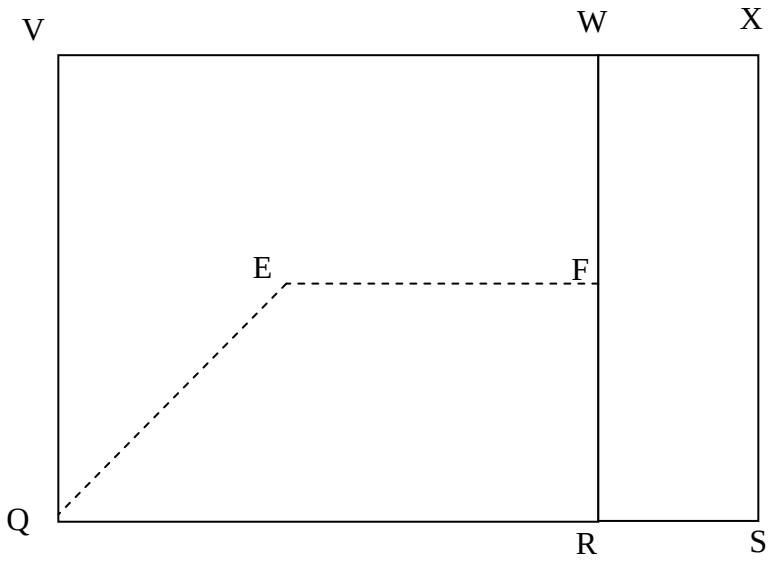
<u>Note</u>: 5 or 6 bars correctly drawn , award K1</td><td>
P1

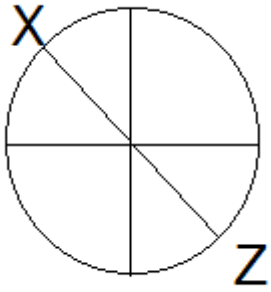
K2
N1</td></tr>
<tr><td></td><td>(e)</td><td></td><td>Any correct information from the histogram drawn</td><td>N1</td></tr>
</table>

Graph for Question 14
Graf untuk Soalan 14



Question			Solution and Marking Criteria	Marks	
15	(a)				12
			Correct shape with rectangle *PQRT* and semicircle *RST* All solid lines.	K1 K1	
			PQ < *QR* Measurements correct to ± 0.2 cm (one way) and Ð *P*, Ð Q , = $90^o \pm 1^o$	N1	

	(b)	(i)	 Correct shape with rectangles *APED* and *PQVQ* All solid lines. *AP = PQ < QV EV < UV* Measurements correct to ± 0.2 cm (one way) and All angles at vertices of rectangles = $90^o \pm 1^o$	K1 K1 N2	
		(ii)	 Correct shape with rectangles *QRWV* and *RSXW* All solid lines.(Ignore PE and EF) Correct trapezium *PTFE* with *PE* and *EF* dashed line *QR >QV >RS , RF =FW* Measurements correct to ± 0.2 cm (one way) and All angles at vertices of rectangles = $90^o \pm 1^o$	K1 K1 K1 N2	

16	(a)		$25^{o}\ E$ Note: 25^{o} or $\theta°E$, award P1	P2	12
	(b)			P1 N1N1	
	(c)		Location of Z (60^{o} S, $25^{o}\ E$) (180 – 60 – 60) × 60 = 3600 nm	K1 N1	
	(d)		Distance = 650 × 60 = 3900 nm $3900 = q' \times 60' \times \cos 60°$ $q = 130°$ Longitude P = 360 – 155 – 130 = $75°E$	K1 N1 K1 K1 N1	

END OF MARKING SCHEME
PERATURAN PEMARKAHAN TAMAT