LEMBAGA PEPERIKSAAN
KEMENTERIAN PELAJARAN MALAYSIA

SIJIL PELAJARAN MALAYSIA 2013 1449/1

MATHEMATICS
Kertas 1
Nov./Dis.

$1\frac{1}{4}$ 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.*

Kertas soalan ini mengandungi 31 halaman bercetak dan 1 halaman tidak bercetak.

[*Lihat halaman sebelah*

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
Isi padu prisma tegak = *luas keratan rentas* $\times$ *panjang*

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

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

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

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

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

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

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

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

[*Lihat halaman sebelah*

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

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

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 Round off 4·086 correct to two significant figures.
Bundarkan 4·086 *betul kepada dua angka bererti.*

A 4·0

B 4·1

C 4·08

D 4·09

2 Express 0·007103 in standard form.
Ungkapkan 0·007103 *dalam bentuk piawai.*

A $7 \cdot 103 \times 10^{4}$

B $7 \cdot 103 \times 10^{3}$

C $7 \cdot 103 \times 10^{-3}$

D $7 \cdot 103 \times 10^{-4}$

3 $\dfrac{0 \cdot 096}{\left(2 \times 10^{3}\right)^{3}} =$

A $1 \cdot 2 \times 10^{-11}$

B $1 \cdot 2 \times 10^{8}$

C $4 \cdot 8 \times 10^{-11}$

D $4 \cdot 8 \times 10^{-8}$

4 Adam has 255 kg of rice. He uses 40% of the rice to cook porridge. The remainder of the rice is divided equally into 3 bags.

Find the mass, in g, of rice in each bag.

Adam mempunyai 255 kg *beras. Dia menggunakan* 40% *daripada beras itu untuk memasak bubur. Baki beras dibahagikan sama banyak ke dalam* 3 *beg.*

Cari jisim, dalam g, *beras dalam setiap beg itu.*

A $3 \cdot 4 \times 10^3$

B $3 \cdot 4 \times 10^4$

C $5 \cdot 1 \times 10^3$

D $5 \cdot 1 \times 10^4$

5 Given $k_8 = 10111_2$, where k is an integer, find the value of k.

Diberi $k_8 = 10111_2$, *di mana k ialah integer, cari nilai k.*

A 17

B 27

C 53

D 56

6 $11001_2 - 1110_2 =$

A 1111_2

B 1101_2

C 1011_2

D 1001_2

7 In Diagram 1, *PQRSTU* is a regular hexagon and *PUWV* is a parallelogram. *TUV* is a straight line.

Dalam Rajah 1, *PQRSTU ialah sebuah heksagon sekata dan PUWV ialah sebuah segi empat selari. TUV ialah garis lurus.*

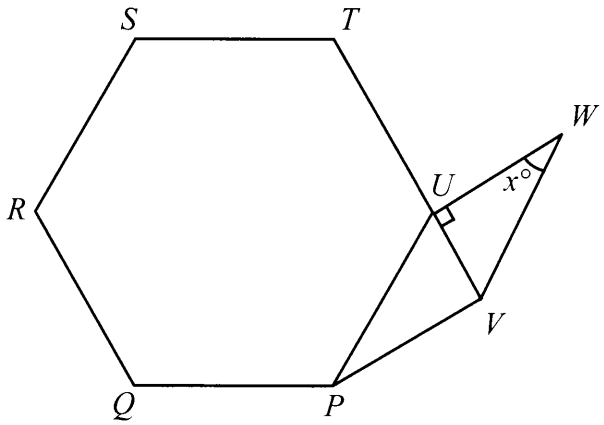


Diagram 1
Rajah 1

Find the value of x.

Cari nilai x.

A 18

B 30

C 60

D 72

8 Diagram 2 shows two circles with centre P and Q respectively. $RSMT$ is a common tangent to the circles at S and M respectively. $KLMN$ is a tangent to the circle, centre P at L.

Rajah 2 menunjukkan dua bulatan, masing-masing berpusat P dan Q. RSMT ialah tangen sepunya kepada bulatan-bulatan, masing-masing di S dan di M. KLMN ialah tangen kepada bulatan berpusat P di L.

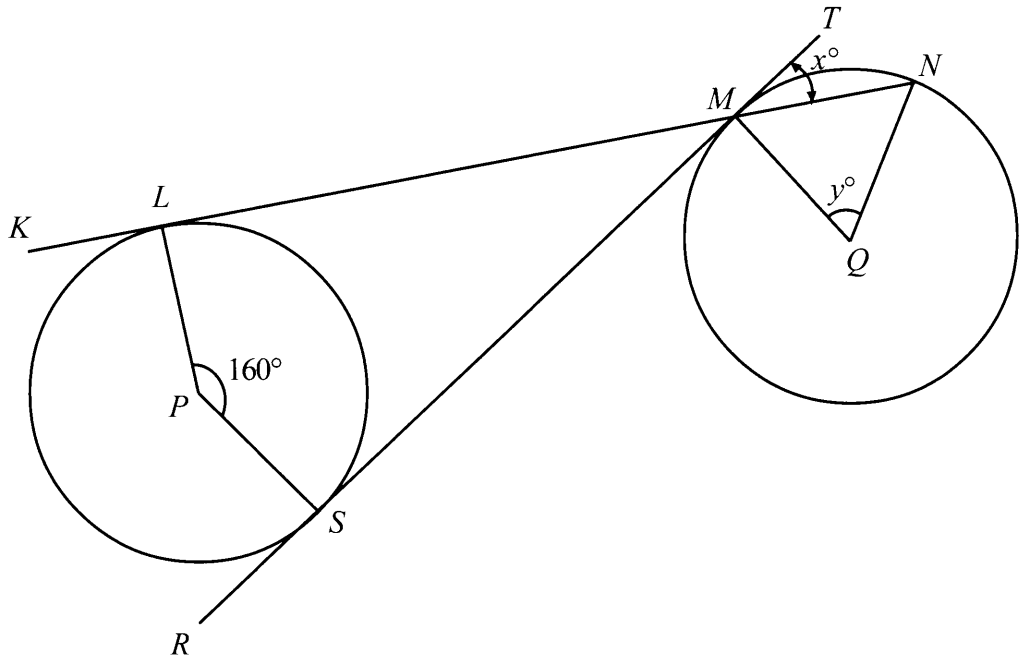


Diagram 2
Rajah 2

Find the value of $x + y$.

Cari nilai $x + y$.

A 40

B 60

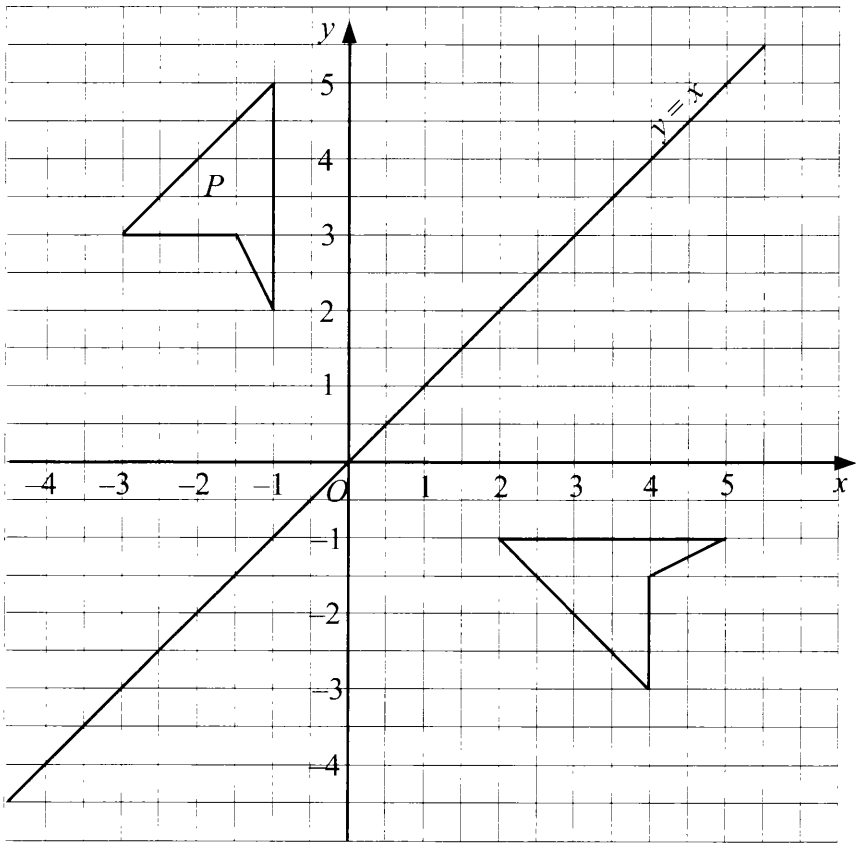
C 65

D 75

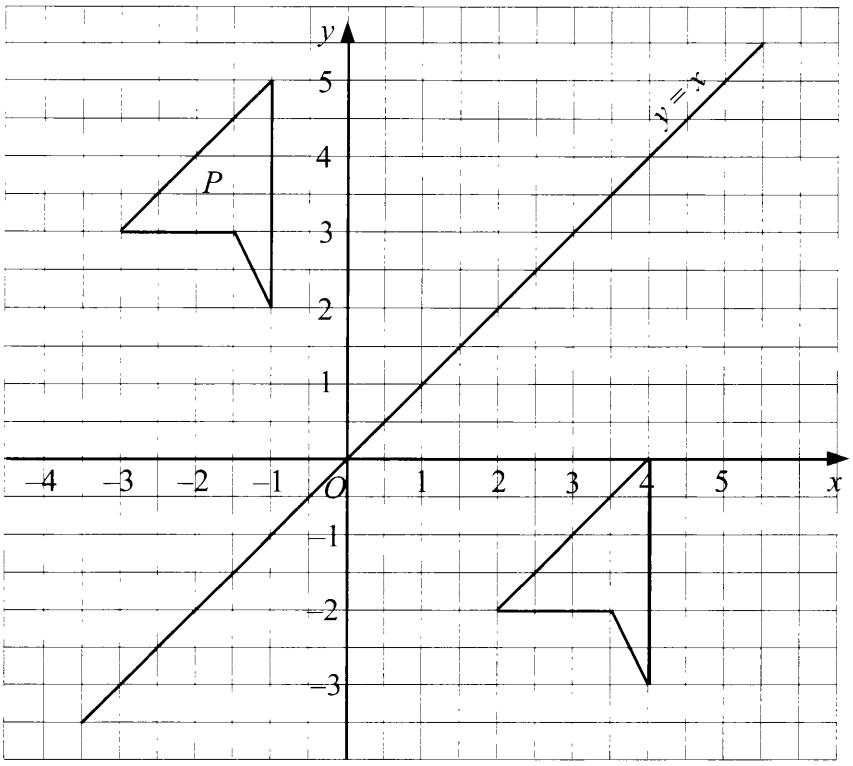
9 Which of the following is the image of quadrilateral P under a reflection in the line $y = x$?

Antara yang berikut, manakah imej bagi sisi empat P di bawah satu pantulan pada garis lurus $y = x$?

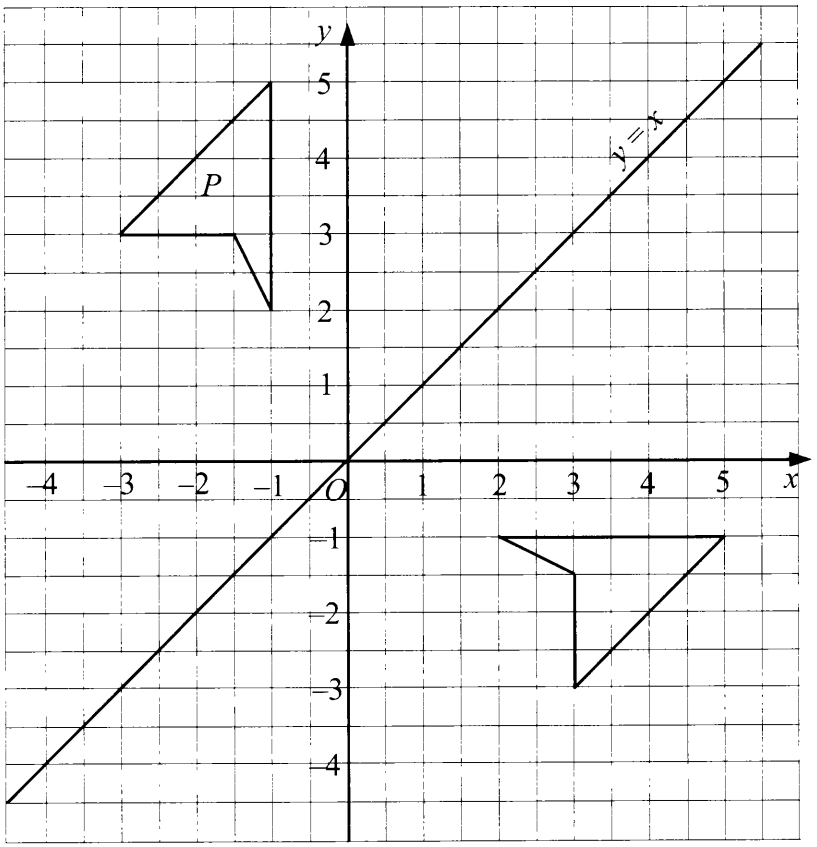
A



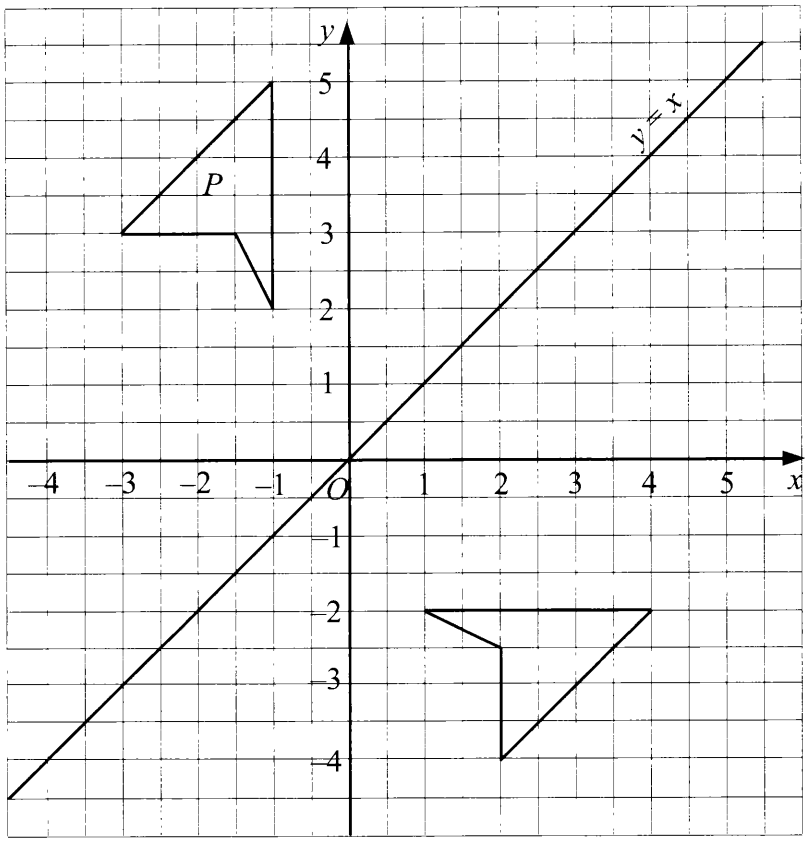
B



C



D

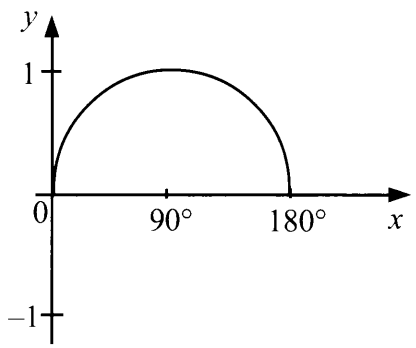


[*Lihat halaman sebelah*

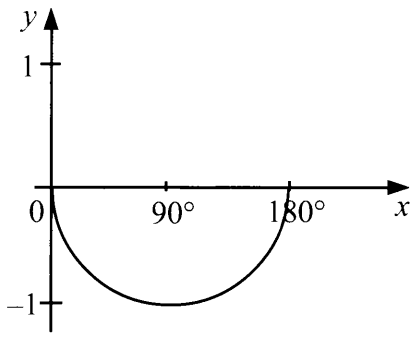
10 Which graph represents $y = \sin x$ for $0° \leq x \leq 180°$?

Graf manakah yang mewakili $y = \sin x$ *bagi* $0° \leq x \leq 180°$?

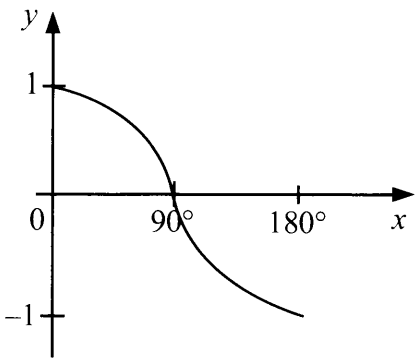
A



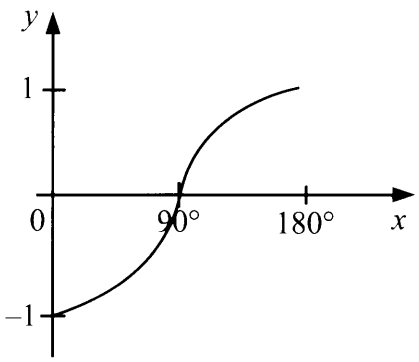
B



C



D



11 In Diagram 3, *KLM* is a straight line.

Dalam Rajah 3, *KLM ialah garis lurus*.

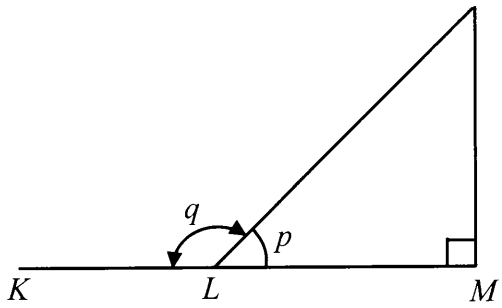


Diagram 3
Rajah 3

Given $\sin p = \frac{3}{5}$, find $\tan q$.

Diberi $\sin p = \frac{3}{5}$, *cari* $\tan q$.

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

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

C $\frac{3}{4}$

D $\frac{4}{3}$

12 In Diagram 4, *PQT* and *RQS* are right angled triangles. *PQR* and *QST* are straight lines.

Dalam Rajah 4, *PQT dan RQS ialah segi tiga bersudut tegak. PQR dan QST ialah garis lurus.*

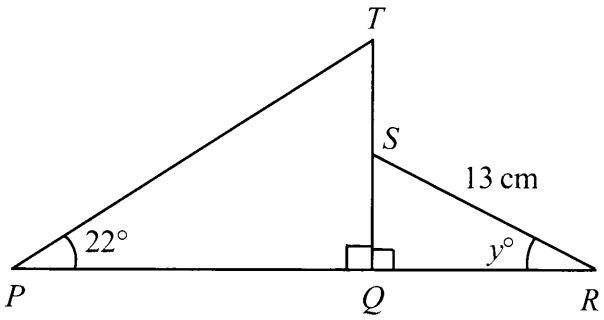


Diagram 4
Rajah 4

It is given that $\sin y° = \frac{5}{13}$ and $QS = ST$.

Calculate the length, in cm, of *PQR*.

Diberi bahawa $\sin y° = \frac{5}{13}$ *dan* $QS = ST$.

Hitung panjang, dalam cm, *PQR*.

A 36·75

B 38·69

C 64·40

D 69·07

13 Diagram 5 shows a right prism with a horizontal base *PQRS*.

Rajah 5 menunjukkan satu prisma tegak dengan tapak mengufuk PQRS.

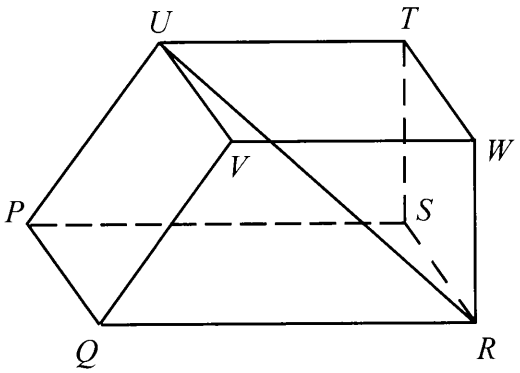


Diagram 5
Rajah 5

Name the angle between the straight line *UR* and the plane *TSRW*.

Namakan sudut di antara garis lurus UR dan satah TSRW.

A $\angle URW$

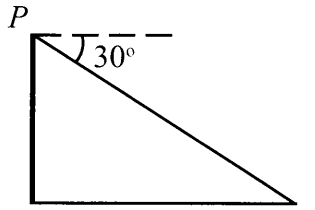
B $\angle URT$

C $\angle RUT$

D $\angle RUW$

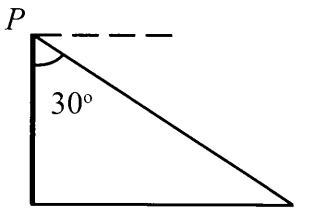
14 It is given that the angle of elevation of P from Q is 30°.
Which of the following diagram represents the situation?
Diberi bahawa sudut dongak P dari Q ialah 30°.
Antara rajah berikut, manakah yang mewakili situasi tersebut?

A



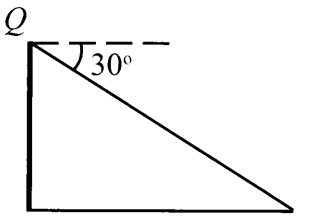
Satah mengufuk

B



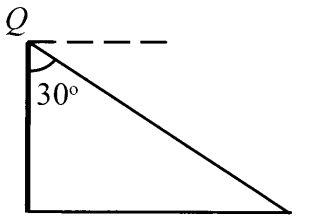
Satah mengufuk

C



Satah mengufuk

D



Satah mengufuk

15 Diagram 6 shows two vertical flagpoles on a horizontal plane. *P*, *Q*, *R* and *S* are four points on the poles.

Rajah 6 *menunjukkan dua tiang bendera tegak pada satah mengufuk. P, Q, R dan S ialah empat titik pada tiang-tiang itu.*

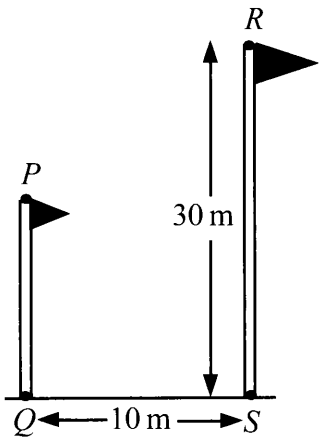


Diagram 6
Rajah 6

The angle of elevation of *R* from *P* is 42°.

Calculate the angle of depression of *S* from *P*.

Sudut dongak R dari P ialah 42°.

Hitung sudut tunduk S dari P.

A 25° 28'

B 27° 54'

C 62° 06'

D 64° 32'

16 Diagram 7 shows Kay observing the peak of a tree.

Rajah 7 menunjukkan Kay memandang ke arah puncak sebatang pokok.

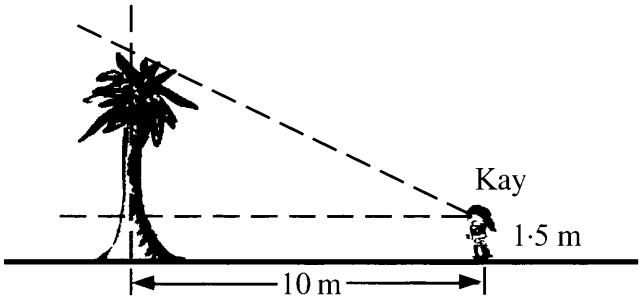


Diagram 7
Rajah 7

Kay stands 10 m away from the tree. The angle of elevation of the peak of a tree from Kay's eye level is 44°.

Calculate the height, in m, of the tree.

Kay berdiri 10 m *dari pokok itu. Sudut dongakan puncak pokok itu dari aras mata Kay ialah* 44°.

Hitung tinggi, dalam m, *pokok itu.*

A 8·45

B 8·69

C 11·16

D 11·86

17 Diagram 8 shows three points, J, K and L, on a horizontal plane. L lies due south of K and the bearing of K from J is 040°.

Rajah 8 menunjukkan tiga titik, J, K dan L, pada satah mengufuk. L terletak ke selatan K dan bearing K dari J ialah 040°.

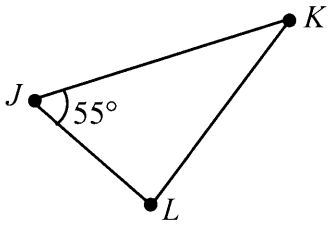


Diagram 8
Rajah 8

Find the bearing of J from L.

Cari bearing J dari L.

A 085°

B 095°

C 235°

D 275°

18 K and L are two points on the same meridian and the latitude of K is 60° S.

Given L is located 25° due north of K, find the latitude of L.

K dan L ialah dua titik pada meridian yang sama dan latitud K ialah 60° *S.*

Diberi L terletak 25° *ke utara K, cari latitud L.*

A 35° S
35° S

B 35° N
35° U

C 85° S
85° S

D 85° N
85° U

19 $(2y - 3x)(x - 4y) =$

A $-3x^2 + 14xy + 8y^2$

B $-3x^2 - 10xy + 8y^2$

C $-3x^2 - 10xy - 8y^2$

D $-3x^2 + 14xy - 8y^2$

20 Given $2 - 3p^2 = 2(m + 3p^2)$, express p in terms of m.
Diberi $2 - 3p^2 = 2(m + 3p^2)$, *ungkapkan p dalam sebutan m.*

A $p = \frac{\sqrt{2-2m}}{9}$

B $p = \frac{\sqrt{2m-2}}{9}$

C $p = \frac{\sqrt{2-2m}}{3}$

D $p = \frac{\sqrt{2m-2}}{3}$

21 Given $\frac{2x}{3} + 1 = 5$, find the value of x.

Diberi $\frac{2x}{3} + 1 = 5$, *cari nilai bagi x.*

A 1
B 6
C 7
D 9

22 $\left(\frac{3}{4}\right)^{-2} =$

A $\frac{4}{9}$

B $\frac{9}{16}$

C $\frac{9}{4}$

D $\frac{16}{9}$

23 $\left(3^6 \times 27\right)^{\frac{1}{3}} \div \left(k^{\frac{1}{2}}\right)^2 =$

A 81k

B 27k

C $\frac{81}{k}$

D $\frac{27}{k}$

24 Find the solution for $\frac{x-6}{-3} < 5$.

Cari penyelesaian untuk $\frac{x-6}{-3} < 5$.

A $x < -9$

B $x < -21$

C $x > -9$

D $x > -21$

25 Diagram 9 shows the scores obtained by the contestants in a quiz.

Rajah 9 menunjukkan skor yang diperoleh oleh peserta-peserta dalam suatu kuiz.

122	155	104	134	155	116

Diagram 9
Rajah 9

Find the median score.

Cari median bagi skor.

A 119

B 128

C 131

D 155

26 A state contingent won 100 medals in a National Sport competition. It is given that the contingent won 40 gold medals and the number of silver medals is twice the number of bronze medals. A pie chart is drawn to represent the medals.

Calculate the angle of the sector which represents the number of bronze medals.

Satu kontinjen negeri telah memenangi 100 *pingat dalam satu pertandingan Sukan Kebangsaan. Diberi bahawa kontinjen itu telah memenangi* 40 *pingat emas dan bilangan pingat perak yang dimenangi adalah dua kali bilangan pingat gangsa. Satu carta pai dilukis untuk mewakili pingat-pingat tersebut.*

Hitung sudut sektor yang mewakili bilangan pingat gangsa.

A 72°

B 108°

C 144°

D 180°

27 Table 1 shows the grade obtained by a group of 30 students in a test.

Jadual 1 *menunjukkan gred yang diperoleh oleh sekumpulan* 30 *orang murid dalam satu ujian.*

Grade ***Gred***	1	2	3	4	5
Frequency ***Kekerapan***	8	10	8	3	1

Table 1
Jadual 1

Calculate the mean grade.

Hitung min bagi gred.

A 1·5

B 2·0

C 2·3

D 3·0

28 Diagram 10 shows the graph of $y = ax^n$.

Rajah 10 *menunjukkan graf* $y = ax^n$.

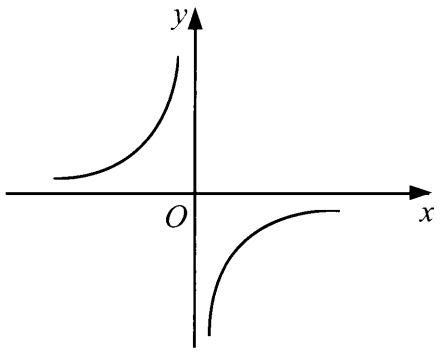


Diagram 10
Rajah 10

State the value of a and of n.

Nyatakan nilai a dan nilai n.

A $a = 1$, $n = 1$

B $a = -1$, $n = 1$

C $a = 1$, $n = -1$

D $a = -1$, $n = -1$

29 Diagram 11 shows a Venn diagram with the universal set, $\xi = P \cup Q \cup R$.

Rajah 11 *menunjukkan gambar rajah Venn dengan set semesta,* $\xi = P \cup Q \cup R$.

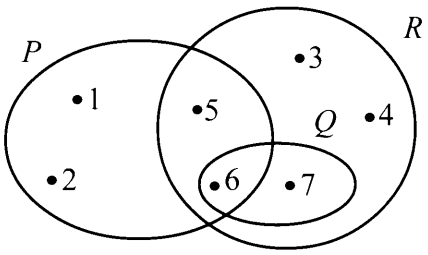


Diagram 11
Rajah 11

List all the elements of set P'.

Senaraikan semua elemen set P'.

A {3, 4}

B {3, 4, 7}

C {3, 4, 5, 7}

D {3, 4, 5, 6, 7}

[*Lihat halaman sebelah*

30 Diagram 12 is a Venn diagram such that the universal set, $\xi = P \cup Q \cup R$.
Rajah 12 *ialah gambar rajah Venn dengan keadaan set universal*, $\xi = P \cup Q \cup R$.

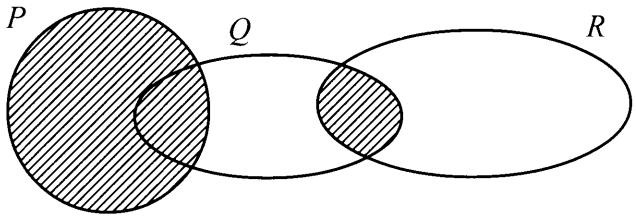


Diagram 12
Rajah 12

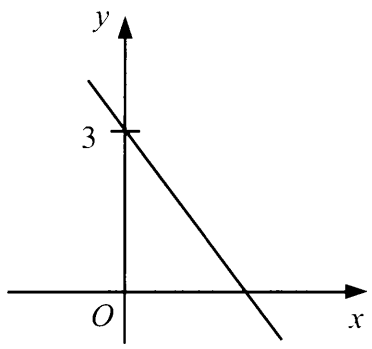
Which set represents the shaded region?
Set manakah yang mewakili kawasan berlorek?

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

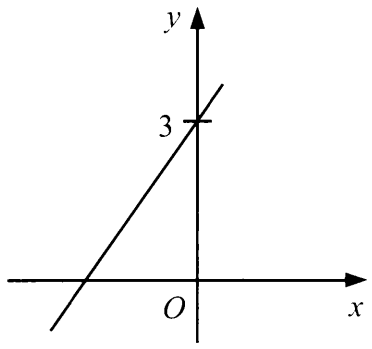
31 Which of the following graph represents $2y + 4x = 3$?

Antara graf berikut, yang manakah mewakili $2y + 4x = 3$?

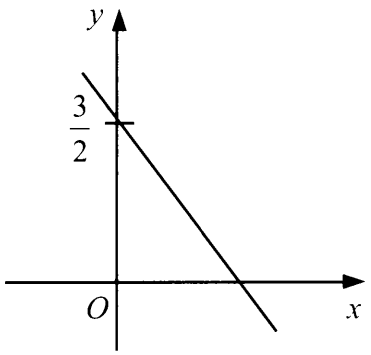
A



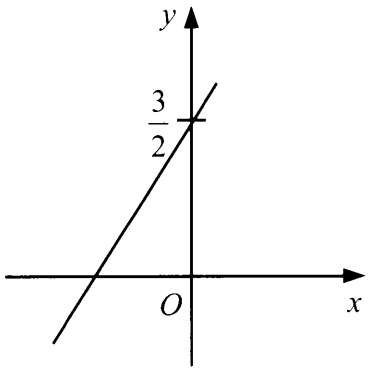
B



C



D



32 It is given that three points, $P(4, 6)$, $Q(2, -2)$ and $R(-5, 7)$ lie on a Cartesian plane. S is the midpoint of the straight line PQ.

Find the gradient of the straight line SR.

Diberi bahawa tiga titik, $P(4, 6)$, $Q(2, -2)$ *dan* $R(-5, 7)$ *terletak pada satah Cartesan. S ialah titik tengah garis lurus PQ.*

Cari kecerunan bagi garis lurus SR.

A $-\frac{5}{8}$

B $-\frac{8}{5}$

C $\frac{5}{8}$

D $\frac{8}{5}$

33 A group of 40 students took a test. A student is chosen at random from the group.

The probability of choosing a student who failed in the test is $\frac{1}{10}$.

Find the number of students who passed the test.

Sekumpulan 40 *murid telah mengambil suatu ujian. Seorang murid dipilih secara rawak daripada kumpulan itu. Kebarangkalian memilih murid yang gagal di dalam ujian itu ialah* $\frac{1}{10}$.

Cari bilangan murid yang lulus dalam ujian itu.

A 4

B 9

C 31

D 36

34 A bag contains 11 red balls, 9 blue balls and x yellow balls. A ball is chosen at random from the bag. The probability of choosing a yellow ball is $\frac{1}{6}$.

Find the probability of choosing a ball which is **not** blue.

Sebuah beg mengandungi 11 *bola merah*, 9 *bola biru dan* x *bola kuning. Sebiji bola dipilih secara rawak daripada beg itu. Kebarangkalian memilih sebiji bola kuning ialah* $\frac{1}{6}$.

Cari kebarangkalian memilih sebiji bola itu **bukan** *biru.*

A $\frac{3}{8}$

B $\frac{5}{8}$

C $\frac{9}{20}$

D $\frac{11}{20}$

35 A Tennis club has 15 male members and a number of female members. A member is chosen at random from the club. The probability of choosing a male member is $\frac{3}{5}$.

Find the number of female member in the club.

Sebuah kelab Tenis mempunyai 15 *ahli lelaki dan beberapa ahli perempuan. Seorang ahli dipilih secara rawak daripada kelab itu. Kebarangkalian memilih seorang ahli lelaki ialah* $\frac{3}{5}$.

Cari bilangan ahli perempuan dalam kelab itu.

A 6

B 9

C 10

D 12

36 Which table represents $y \alpha x^2$?

Jadual manakah yang mewakili $y \alpha x^2$?

A

x	1	2	4
y	64	16	4

B

x	2	3	5
y	25	15	12

C

x	3	5	7
y	18	50	98

D

x	2	3	4
y	16	54	128

37 It is given that y varies inversely as square root of x and $y = 3$ when $x = 64$.

Calculate the value of y when $x = 16$.

Diberi bahawa y *berubah secara songsang dengan punca kuasa dua* x *dan* $y = 3$ *apabila* $x = 64$.

Hitung nilai y *apabila* $x = 16$.

A $\frac{3}{16}$

B $\frac{3}{2}$

C 12

D 6

38 The relation between P, q and r is $P \propto \frac{q^2}{r}$. It is given that $P = 8$ when $q = 2$ and $r = 3$.

Calculate the value of P when $q = 6$ and $r = 4$.

Hubungan di antara P, q dan r ialah $P \propto \frac{q^2}{r}$. *Diberi bahawa* $P = 8$ *apabila* $q = 2$ *dan* $r = 3$.

Hitung nilai P apabila $q = 6$ *dan* $r = 4$.

A $\frac{4}{9}$

B $\frac{3}{2}$

C 9

D 54

39 Given:

Diberi:

$$\begin{pmatrix} 8 & 2 \end{pmatrix} \begin{pmatrix} x \\ -4 \end{pmatrix} = \begin{pmatrix} 40 \end{pmatrix}$$

Find the value of x.

Cari nilai x.

A 4

B 5

C 6

D 8

40 $\begin{pmatrix} 2 & \frac{1}{3} \end{pmatrix} \begin{pmatrix} 0 & -4 \\ 15 & 3 \end{pmatrix} =$

A $(5 \quad -7)$

B $\begin{pmatrix} 30 & -\frac{1}{3} \end{pmatrix}$

C $\begin{pmatrix} 5 \\ -7 \end{pmatrix}$

D $\begin{pmatrix} 30 \\ -\frac{1}{3} \end{pmatrix}$

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. Answer each question by blackening the correct space on the objective answer sheet.
   Jawab setiap soalan dengan menghitamkan ruangan yang betul pada kertas jawapan objektif.

4. Blacken only **one** space for each question.
   Hitamkan **satu** *ruangan sahaja bagi setiap soalan.*

5. If you wish to change your answer, erase the blackened mark that you have done. Then blacken the space for the new answer.
   Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.

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

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

8. You may use a scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik.

