

SULIT

Mathematics
Kertas 1
September
2010

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

1449/1



**PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH MALAYSIA (PKPSM) CAWANGAN MELAKA
DENGAN KERJASAMA
JABATAN PELAJARAN MELAKA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010
MATHEMATICS**

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.
3. Kertas soalan ini mengandungi **40 soalan**.
4. Jawab **semua** soalan.
5. Jawab **semua** soalan dengan **menghitamkan** ruangan yang betul pada kertas jawapan objektif.
6. **Hitamkan satu** ruangan sahaja bagi setiap soalan.
7. Rajah yang mengiringi soalan **tidak dilukis** mengikut skala kecuali dinyatakan.
8. Satu senarai rumus disediakan di halaman 2 dan 3.
9. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.

Kertas soalan ini mengandungi 19 halaman bercetak

MATHEMATICAL FORMULAE

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

RELATIONS

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

6
$$P(A') = 1 - P(A)$$

7
$$\text{Distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

8
$$\text{Midpoint, } (x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

9
$$\text{Average speed} = \frac{\text{distance travelled}}{\text{time taken}}$$

10
$$\text{Min} = \frac{\text{sum of data}}{\text{number of data}}$$

11
$$\text{Mean} = \frac{\text{sum of (class mark} \times \text{frequency)}}{\text{sum of frequencies}}$$

12
$$\text{Pythagoras Theorem}$$
$$c^2 = a^2 + b^2$$

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

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

SHAPES AND SPACE

- 1 Area of trapezium = $\frac{1}{2} \times$ sum of parallel sides \times height
- 2 Circumference of circle = $\pi d = 2\pi r$
- 3 Area of circle = πr^2
- 4 Curved area of cylinder = $2\pi r h$
- 5 Surface area of sphere = $4\pi r^2$
- 6 Volume of right prism = cross sectional area \times length
- 7 Volume of cylinder = $\pi r^2 h$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times$ base area \times height
- 11 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
- 12
$$\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 13
$$\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 14 Scale factor, $k = \frac{PA'}{PA}$
- 15 Area of image = $k^2 \times$ area of object

*Answer all questions.
Jawab semua soalan.*

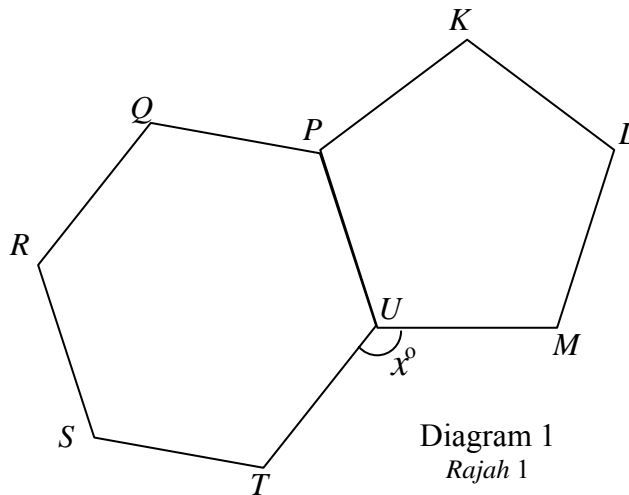
- 1 Find the value of $(7 + 1.65) \times 0.16$ and round off the answer correct to three significant figures.
Cari nilai $(7 + 1.65) \times 0.16$ dan bundarkan jawapan betul kepada tiga angka bererti.
- A 1.38
B 7.23
C 1.384
D 7.264
- 2 Express 5630000 in standard form.
Ungkapkan 5630000 dalam bentuk piawai.
- A 5.63×10^{-6}
B 5.63×10^{-4}
C 5.63×10^4
D 5.63×10^6
- 3 $9.3 \times 10^{14} - 4.5 \times 10^{13} =$
- A 8.85×10^{14}
B 4.80×10^{14}
C 8.85×10^{13}
D 4.80×10^{13}
- 4 $\frac{0.0084}{600000} =$
- A 1.4×10^{-8}
B 1.4×10^8
C 1.4×10^{-2}
D 1.4×10^2
- 5 State the value of the digit 3 in the number 1324_5 , in base ten.
Nyatakan nilai digit 3 bagi nombor 1324_5 , dalam asas sepuluh.
- A 25
B 30
C 45
D 75

6 $110110_2 + 110111_2$

- A 1011011_2
- B 1101101_2
- C 1101110_2
- D 1110011_2

7 Diagram 1 shows $PQRSTU$ and $KLMUP$ are regular polygons.

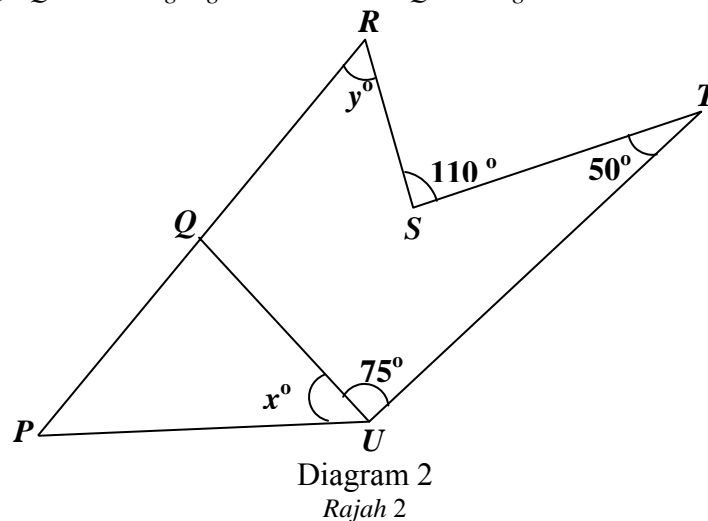
Rajah 1 menunjukkan $PQRSTU$ dan $KLMUP$ ialah poligon sekata.



Find the value of x .
Cari nilai x .

- A 108
- B 120
- C 132
- D 228

8 In Diagram 2, PQU is an equilateral triangle and PQR is a straight line.
Dalam Rajah 2, PQU ialah segi tiga sama sisi dan PQR ialah garis lurus.



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

- A 95
- B 105
- C 135
- D 250

- 9 In Diagram 3, PQR is a tangent to the circle at point Q . QST is an isosceles triangle.
 Dalam Rajah 3, PQR ialah tangen kepada bulatan di titik Q . QST ialah segi tiga sama kaki.

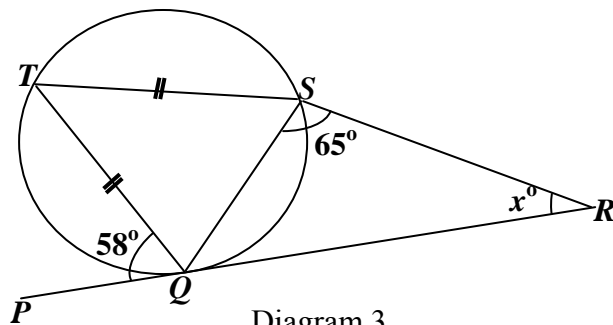


Diagram 3
 Rajah 3

Find the value of x .
 Cari nilai x .

- A 51
 - B 57
 - C 60
 - D 61
- 10 Diagram 4, shows five pentagons drawn on square grids.
 Rajah 4, menunjukkan lima pentagon di lukis pada grid segi empat sama.

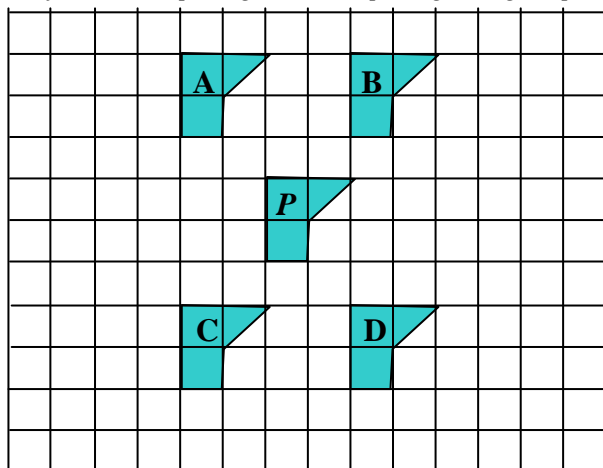


Diagram 4
 Rajah 4

Which of the pentagon **A**, **B**, **C** or **D**, is an image of pentagon P under a translation

$$\begin{pmatrix} 2 \\ -3 \end{pmatrix}?$$

Antara pentagon **A**, **B**, **C** atau **D**, yang manakah imej bagi pentagon P di bawah translasi $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$?

- 11 Diagram 5 shows parallelogram P and Q drawn on a Cartesian plane. Q is the image of P under an enlargement.

Rajah 5 menunjukkan dua segi empat selari P dan Q dilukis di atas satah Cartesian. Q adalah imej bagi P di bawah suatu pembesaran.

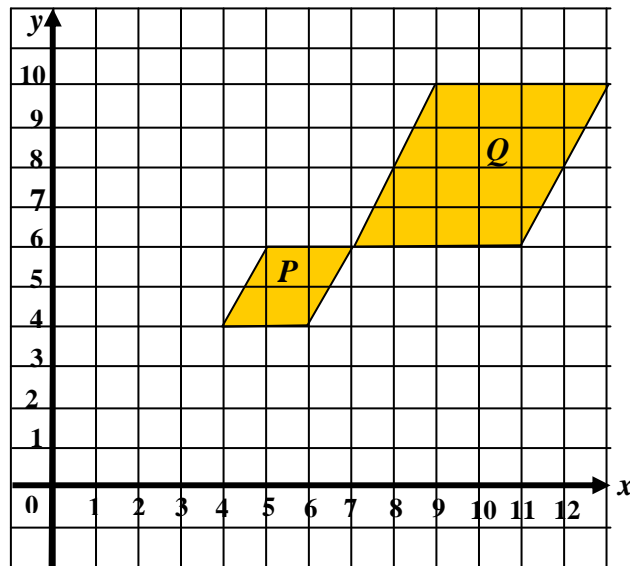


Diagram 5
Rajah 5

Find the centre and the scale factor of the enlargement.

Cari pusat pembesaran dan faktor skala pembesaran itu.

	Centre of enlargement <i>Pusat pembesaran</i>	Scale factor <i>Faktor skala</i>
A	(1, 2)	2
B	(1, 2)	$\frac{1}{2}$
C	(2, 1)	2
D	(2, 1)	$\frac{1}{2}$

- 12 In Diagram 6, $PQRSTU$ is a regular hexagon and PQV is a straight line.

Dalam Rajah 6, $PQRSTU$ ialah sebuah heksagon sekata dan PQV ialah satu garis lurus.

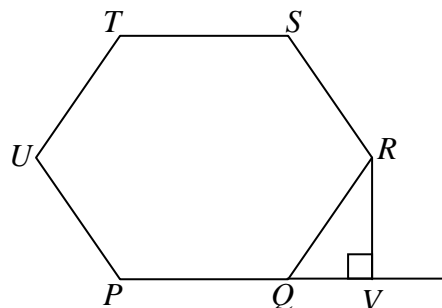


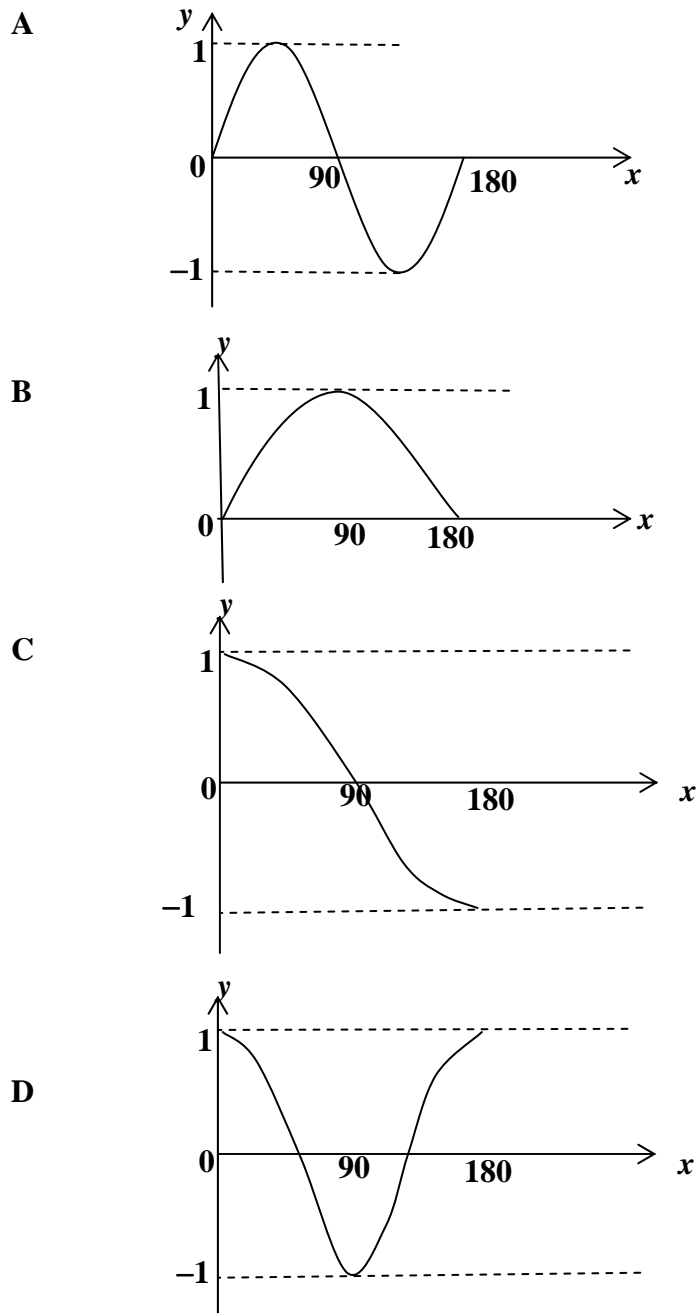
Diagram 6
Rajah 6

Given $\sin \angle RQV = \frac{12}{13}$, find the value of $\cos \angle UTS$.

Diberi $\sin \angle RQV = \frac{12}{13}$, cari nilai bagi $\cos \angle UTS$.

- A $\frac{5}{13}$
- B $\frac{12}{13}$
- C $-\frac{5}{13}$
- D $-\frac{12}{13}$

13 Which graph represent $y = \sin x^\circ$ for $0^\circ \leq x \leq 180^\circ$?
 Graf manakah yang mewakili $y = \sin x^\circ$ bagi $0^\circ \leq x \leq 180^\circ$?



- 14 Diagram 7 shows a prism with horizontal square base $HJKL$. Trapezium $EFLK$ is the uniform cross-section of the prism. $DEKJ$ is vertical and $GFLH$ is inclined.

Rajah 7 menunjukkan sebuah prisma dengan tapak segi empat $HJKL$ sebagai tapak mengufuk. Trapezium $EFLK$ adalah keratan rentas seragam prisma itu. $DEKJ$ adalah satah menegak dan $GFLH$ adalah satah condong.

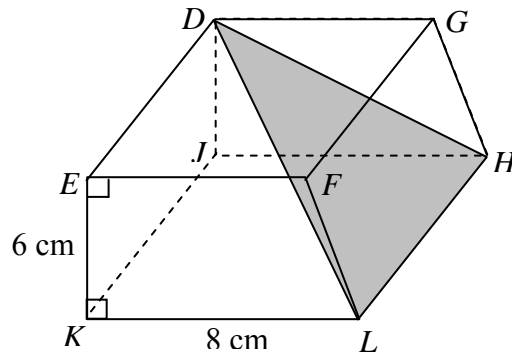


Diagram 7
Rajah 7

Name the angle between the plane DLH and the base $HJKL$.
Namakan sudut di antara satah DLH dan tapak $HJKL$.

- A $\angle DLK$
B $\angle DHJ$
C $\angle GHJ$
D $\angle GHD$
- 15 In Diagram 8, PQ and RS are two vertical poles on a horizontal plane.
Dalam Rajah 8, PQ dan RS adalah dua batang tiang yang terletak pada permukaan mengufuk.

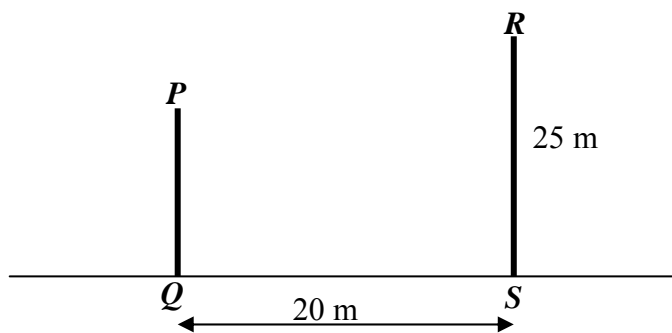


Diagram 8
Rajah 8

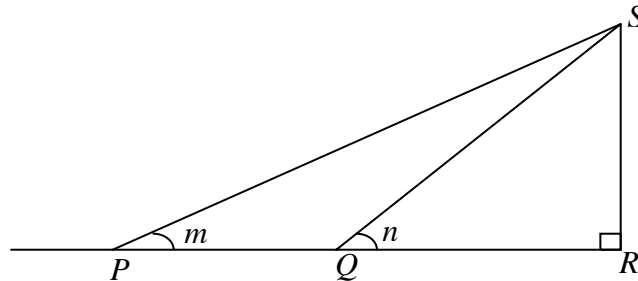
The angle of elevation of P from S is 30° . Calculate the angle of elevation of R from P .
Sudut dongak puncak P dari S ialah 30° . Hitungkan sudut dongak puncak R dari P .

- A 30°
B $33^\circ 55'$
C $51^\circ 20'$
D 60°

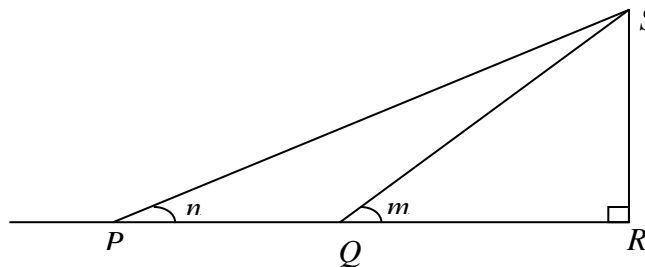
- 16 P, Q and R are three points on the horizontal ground. S is a point on vertical pole. The angle of depression of P from S is m and the angle of depression of Q from S is n . Which diagram represents the situation?

P, Q and R ialah tiga titik pada tanah mengufuk. S ialah satu titik pada tiang tegak. Sudut tunduk P dari S ialah m dan sudut tunduk Q dari S ialah n . Rajah manakah yang mewakili situasi tersebut?

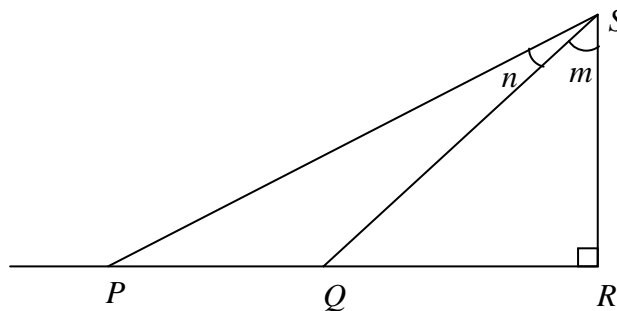
A



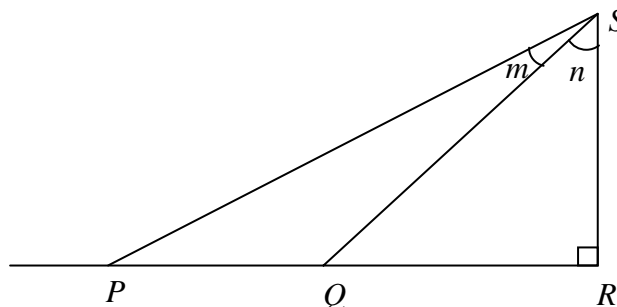
B



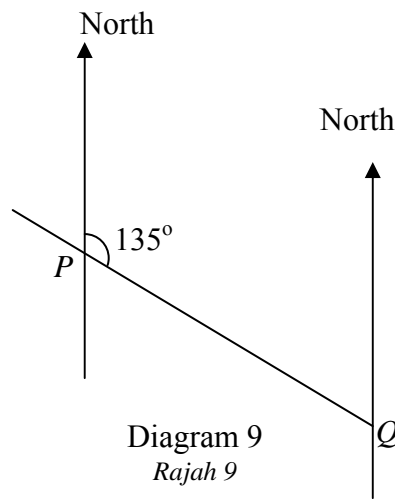
C



D

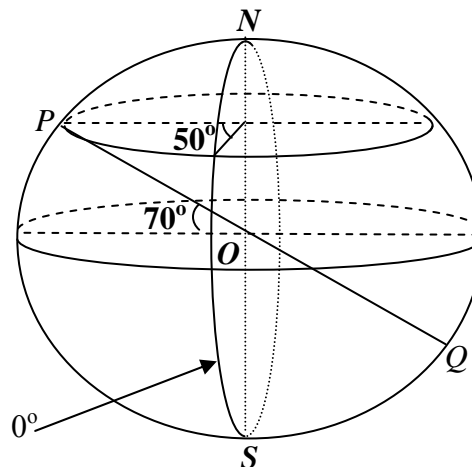


- 17 Diagram 9 shows the position of point P and point Q .
Rajah 9 menunjukkan kedudukan titik P dan titik Q .



Find the bearing of P from Q .
 Carikan bearing P dari Q .

- A 045°
 B 135°
 C 225°
 D 315°
- 18 In Diagram 10, N is the North Pole, S is the South Pole and PQ is the diameter of the earth.
Dalam Rajah 10, N ialah Kutub Utara, S ialah Kutub Selatan, dan PQ ialah diameter bumi.



Find the location of Q .
 Cari kedudukan titik Q .

Diagram 10
Rajah 10

- A $(70^\circ S, 50^\circ W)$
 B $(70^\circ S, 50^\circ E)$
 C $(70^\circ S, 130^\circ W)$
 D $(70^\circ S, 130^\circ E)$

19 $(3m + 2)(1 - n) - (5 - m)(n - 3) =$

- A $6m - 4mn - 7n - 13$
 B $6m - 2mn - 7n + 17$
 C $17 - 2mn - 7n$
 D $17 - 2mn + 7n$

20 Express $\frac{3+h}{h} \times \frac{4h^2}{9-h^2}$ as a single fraction in its simplest form.

Nyatakan $\frac{3+h}{h} \times \frac{4h^2}{9-h^2}$ sebagai pecahan tunggal dalam sebutan terendah.

- A $\frac{4h}{3-h}$
 B $\frac{4h}{3+h}$
 C $\frac{12h}{3-h}$
 D $\frac{12}{3+h}$

21 Given $k = \sqrt{\frac{3-m}{2}}$, express m in terms of k .

Diberi $k = \sqrt{\frac{3-m}{2}}$, ungkapkan m dalam sebutan k .

- A $m = 2\sqrt{k} - 3$
 B $m = 3 - 2\sqrt{k}$
 C $m = 2k^2 - 3$
 D $m = 3 - 2k^2$

22 Given $5x - 3 = 7 - (2 - x)$, calculate the value of x .

Diberi $5x - 3 = 7 - (2 - x)$, hitung nilai x .

- A $\frac{1}{2}$
 B $\frac{4}{3}$
 C 2
 D $\frac{11}{2}$

23 $\frac{1}{\sqrt[3]{p^4}} =$

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

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

C $p^{\frac{3}{4}}$

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

24 $(4p^{-1}q^3)^2 \div 2p^{-2}q =$

A $2q^5$

B $8q^5$

C $2pq^5$

D $8pq^5$

25

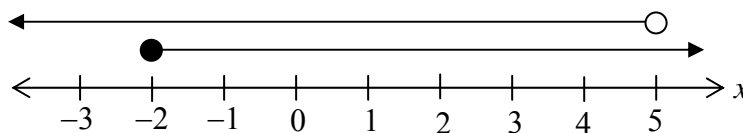


Diagram 11

Rajah 11

Which of the following simultaneous linear inequalities satisfy the number line in Diagram 11?

Ketaksamaan linear serentak manakah yang memenuhi garis nombor dalam Rajah 11?

A $-2 < x < 5$

B $-2 \leq x \leq 5$

C $-2 \leq x < 5$

D $-2 < x \leq 5$

26 Given that the solution of both the simultaneous linear inequalities $\frac{8-y}{2} < 3$ and $3(y-6) < 2(6-y)$ is $p < y < q$. Find the value of p and of q .

Diberi bahawa penyelesaian bagi kedua-dua ketaksamaan linear serentak $\frac{8-y}{2} < 3$ dan

$3(y-6) < 2(6-y)$ ialah $p < y < q$. Cari nilai p dan nilai q .

A $p = -2, q = 6$

B $p = 2, q = 6$

C $p = -2, q = \frac{9}{2}$

D $p = 2, q = \frac{9}{2}$

- 27 The pie chart in Diagram 12 shows Ahmad’s monthly expenditure. Ahmad’s monthly expenditure on transport is RM 240.
 Carta pai dalam Rajah 12 menunjukkan perbelanjaan bulanan Ahmad. Perbelanjaan bulanan Ahmad untuk pengangkutan ialah RM 240.

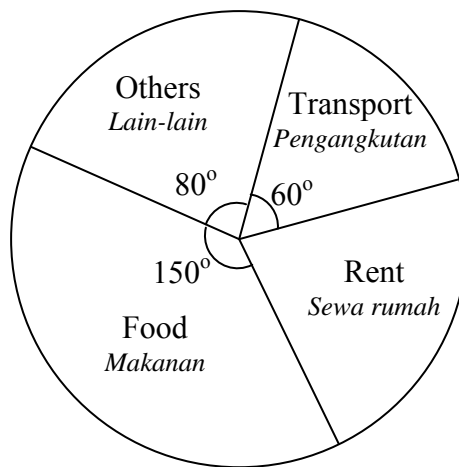
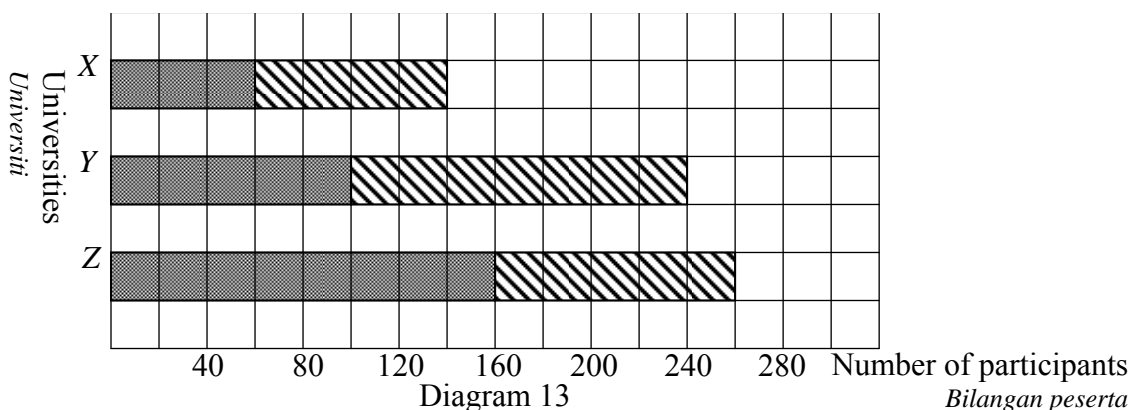


Diagram 12
Rajah 12

Ahmad’s monthly expenditure on rent and food, in RM is
 Perbelanjaan bulanan Ahmad untuk sewa rumah dan makanan , dalam RM ialah

- A 600
 B 810
 C 880
 D 900
- 28 The bar chart in Diagram 13 shows the number of participants in a marathon for three universities X, Y and Z.
 Carta palang dalam Rajah 13 menunjukkan bilangan peserta dalam acara marathon bagi tiga buah universiti X, Y dan Z.



Key :
 Petunjuk :
 Female / Perempuan
 Male / Lelaki

Find the percentage of the female participants from university Y in the marathon.
Cari peratus peserta perempuan dari universiti Y dalam acara marathon itu.

- A 15.63
- B 31.25
- C 41.67
- D 58.33

- 29 Table 1 shows the number of children in 40 families.
Jadual 1 menunjukkan bilangan anak yang dipunyai oleh 40 buah keluarga.

Number of children <i>Bilangan anak</i>	1	2	3	4	5
Number of families <i>Bilangan keluarga</i>	8	14	7	5	6

Table 1
Jadual 1

Find the mean number of children.
Cari min bagi bilangan anak.

- A 2.68
 - B 3.00
 - C 7.13
 - D 8.00
- 30 Diagram 14 shows the graph of $y = x^n + p$.
Rajah 14 menunjukkan graf bagi $y = x^n + p$.

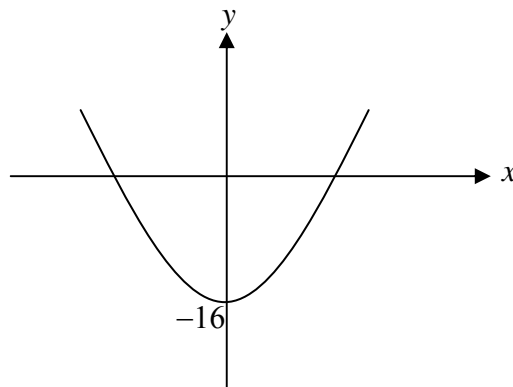


Diagram 14
Rajah 14

Find the value of n and of p .
Cari nilai n dan nilai p .

- A $n = -2, p = -16$
- B $n = -2, p = 16$
- C $n = 2, p = -16$
- D $n = 2, p = 16$

31 Diagram 15 shows a Venn diagram with the universal set , $\xi = M \cup N$.

Rajah 15 menunjukkan gambar rajah Venn dengan set semesta , $\xi = M \cup N$.

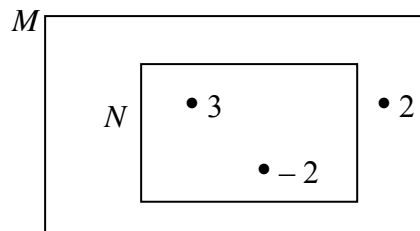


Diagram 15

Rajah 15

List all the subsets of set N .

Senaraikan semua subset bagi set N .

- A { 2 }
- B { -2 }, { 3 }
- C { }, { -2 }, { 2 }, { 3 }
- D { }, { -2 }, { 3 }, { -2 , 3 }

32 Diagram 16 is a Venn diagram showing the number of elements in set P , set K and set R

Rajah 16 ialah gambar rajah Venn yang menunjukkan bilangan unsur dalam set P , set K dan set R .

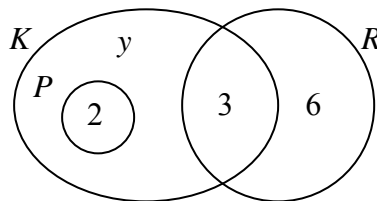


Diagram 16

Rajah 16

It is given that the universal set , $\xi = P \cup K \cup R$ and $n(\xi) = 29$.

Find the value of $n(P')$.

Diberi bahawa set semesta , $\xi = P \cup K \cup R$ dan $n(\xi) = 29$.

Cari nilai bagi $n(P')$.

- A 18
- B 20
- C 23
- D 27

- 33 Diagram 17 shows a straight line KL with equation $2y = -mx + 8$, where m is a constant .

Rajah 17 menunjukkan garis lurus KL yang mempunyai persamaan $2y = -mx + 8$, dengan keadaan m ialah pemalar.

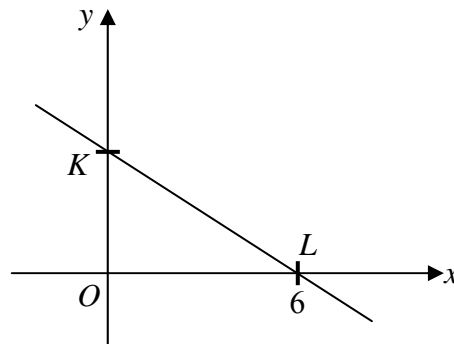


Diagram 17
Rajah 17

It is given that $OL : OK = 3 : 2$.

Find the value of m .

Diberi bahawa $OL : OK = 3 : 2$.

Cari nilai m .

- A -2
- B $-\frac{4}{3}$
- C $\frac{4}{3}$
- D 2
- 34 The gradient of a straight line is $-\frac{2}{5}$ and the x -intercept is 10.
- Find the y -intercept .

Kecerunan suatu garis lurus ialah $-\frac{2}{5}$ dan pintasan- x ialah 10.

Cari pintasan- y .

- A 25
- B 4
- C -4
- D -25

- 35 Table 2 shows how a group of 450 students travel to school.
Jadual 2 menunjukkan bagaimana sekumpulan 450 orang murid ke sekolah.

Type of transport <i>Jenis pengangkutan</i>	Bicycle <i>Basikal</i>	Motorcycle <i>Motosikal</i>	Car <i>Kereta</i>	Bus <i>Bas</i>
Number of students <i>Bilangan murid</i>	130	50	70	200

Table 2
Rajah 2

A student is chosen at random from the group.
 Find the probability that the student travels to school by bus .
*Seorang murid dipilih secara rawak daripada kumpulan itu .
 Cari kebarangkalian bahawa murid itu pergi ke sekolah menaiki bas .*

- A $\frac{1}{450}$
 B $\frac{1}{70}$
 C $\frac{4}{9}$
 D $\frac{1}{3}$

- 36 A container holds 50 packs of sweets and a number of packs of chocolates .The probability of picking at random a pack of chocolate is $\frac{3}{5}$.

How many packs of sweets are there in the container ?

Sebuah bekas mengandungi 50 bungkus gula-gula dan beberapa bungkus coklat. Kebarangkalian bahawa sebungkus coklat dipilih secara rawak ialah $\frac{3}{5}$.

Berapakah bilangan bungkus gula-gula dalam bekas itu ?

- A 20
 B 30
 C 35
 D 45

- 37 It is given that y varies inversely as the square root of x .
 Find the relation between y and x .

*Diberi bahawa y berubah secara songsang dengan punca kuasa dua x .
 Cari hubungan antara y dan x .*

- A $y \propto \sqrt{x}$
 B $y \propto \frac{1}{\sqrt{x}}$
 C $y \propto x^2$
 D $y \propto \frac{1}{x^2}$

- 38 It is given that $p \propto \frac{q^m}{r^n}$ and p varies directly as the square of q and inversely as the square root of r .

State the value of m and of n .

Diberi bahawa $p \propto \frac{q^m}{r^n}$ dan p berubah secara langsung dengan kuasa dua q dan secara songsang dengan punca kuasa dua r .
Nyatakan nilai m dan nilai n .

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

39
$$\begin{pmatrix} 4 & 7 \\ -2 & 5 \end{pmatrix} - 3 \begin{pmatrix} -1 & 3 \\ -2 & 0 \end{pmatrix}$$

- A $\begin{pmatrix} 7 & -2 \\ 4 & 5 \end{pmatrix}$
- B $\begin{pmatrix} 1 & -2 \\ -8 & 5 \end{pmatrix}$
- C $\begin{pmatrix} 7 & -2 \\ -8 & 5 \end{pmatrix}$
- D $\begin{pmatrix} 7 & -2 \\ 8 & 5 \end{pmatrix}$

40 Given $(2t \ 3) \begin{pmatrix} -1 \\ 4 \end{pmatrix} = (16)$, find the value of t .

Diberi $(2t \ 3) \begin{pmatrix} -1 \\ 4 \end{pmatrix} = (16)$, cari nilai t .

- A -1
- B -2
- C -3
- D -4

END OF QUESTION PAPER