

SULIT
1449/1
Matematik
Kertas 1
Ogos/Sept. 2018
 $1 \frac{1}{4}$ jam



**MAJLIS PENGETUA SEKOLAH MALAYSIA
NEGERI SEMBILAN**

**PROGRAM PENINGKATAN AKADEMIK TINGKATAN 5
SEKOLAH-SEKOLAH MENENGAH NEGERI SEMBILAN 2018**

MATEMATIK

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. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Kertas soalan ini mengandungi 31 halaman bercetak.

Answer **all** questions.

Jawab **semua** soalan.

- 1 Round off 30 783 correct to three significant figures.

Bundarkan 30 783 betul kepada tiga angka bererti.

- A 307
- B 308
- C 30 700
- D 30 800

- 2 The perimeter of a rectangle is 1.6×10^{-1} m. Given the length is 5.0×10^{-2} m, find the width, in m.

Perimeter sebuah segi empat tepat ialah 1.6×10^{-1} m. Diberi panjangnya ialah 5.0×10^{-2} m, cari lebarnya, dalam m.

- A 3.2×10^{-2}
- B 3.0×10^{-2}
- C 1.1×10^{-1}
- D 6.0×10^{-1}

- 3 Calculate $\frac{0.096}{20000} =$

Hitung $\frac{0.096}{20000} =$

- A 4.8×10^{-6}
- B 4.8×10^{-7}
- C 4.8×10^6
- D 4.8×10^7

- 4 A factory packs 10 300 kg of instant noodles into packets. Each packet is filled with 250 g of instant noodles.
Calculate the number of packets produced.

*Sebuah kilang membungkus 10 300 kg mee segera ke dalam paket-paket. Setiap paket itu diisi dengan 250 g mee segera.
Hitung bilangan paket yang dihasilkan.*

- A 4.12×10^1
B 4.12×10^2
C 4.12×10^4
D 4.12×10^5
- 5 Find the value of h where $h_8 = 10111_2$.
- Cari nilai bagi h dengan keadaan $h_8 = 10111_2$.*
- A 16
B 17
C 23
D 27
- 6 Calculate the difference between 1001101_2 and 1111_2 .

Hitung beza antara 1001101_2 dan 1111_2 .

- A 111110_2
B 111100_2
C 1000010_2
D 1011100_2

- 7 Diagram 1, $JKLMNP$ is an irregular polygon. JNM and PNL are straight lines.
Rajah 1, $JKLMNP$ ialah poligon tidak sekata. JNM dan PNL ialah garis lurus.

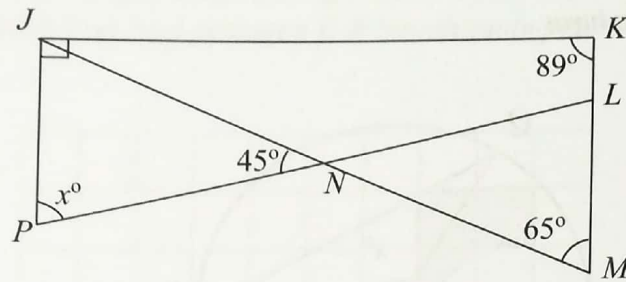


Diagram 1
Rajah 1

Find the value of x .

Cari nilai x .

- A 55
 B 61
 C 71
 D 75
- 8 Diagram 2, $QRSTU$ is a pentagon and RST is an isosceles triangle. PQR , QUV and UTW are straight lines.

Rajah 2, $QRSTU$ ialah sebuah pentagon dan RST ialah sebuah segi tiga sama kaki. PQR , QUV dan UTW ialah garis lurus.

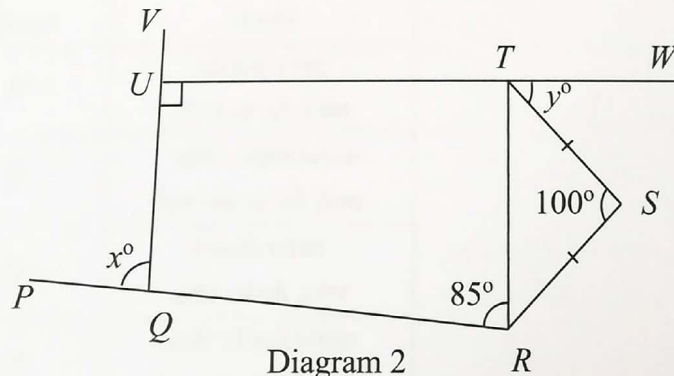


Diagram 2
Rajah 2

Find the value of $x + y$.

Cari nilai $x + y$.

- A 125
 B 135
 C 145
 D 155

- 9 Diagram 3, RS is a tangent to the circle centre O , at R . OPS and QOR are straight lines.

Rajah 3, RS ialah tangen kepada suatu bulatan pusat O , di R . OPS dan QOR ialah garis lurus.

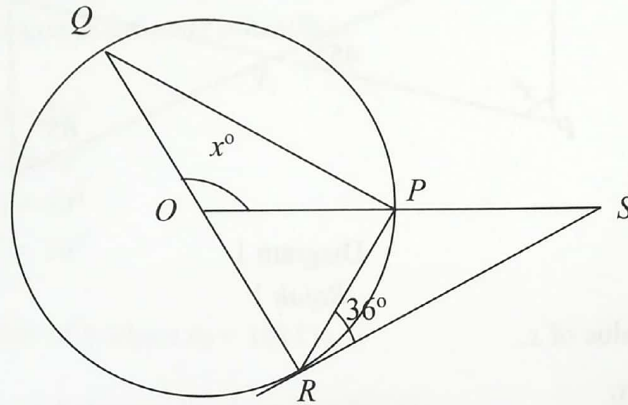


Diagram 3
Rajah 3

Find the value of x .

Cari nilai x .

- A 98
- B 108
- C 136
- D 144

- 10 In Diagram 4, pentagon E and pentagon F drawn on a square grid. Pentagon F is the image of pentagon E under a rotation of 90° .

Dalam Rajah 4, pentagon E dan pentagon F dilukis pada grid segi empat sama. Pentagon F ialah imej bagi pentagon E di bawah suatu putaran 90° .

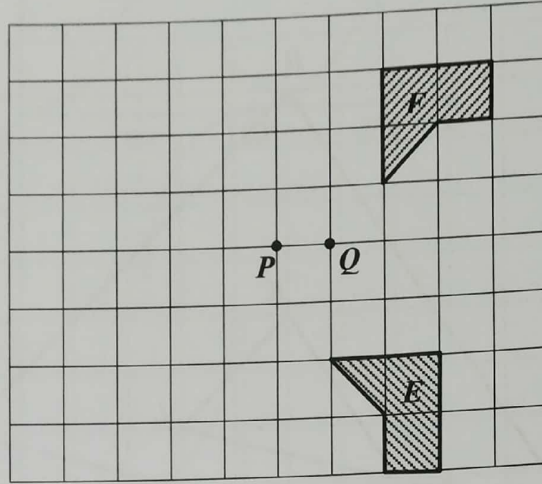


Diagram 4
Rajah 4

Which of the following is true?

Antara berikut, manakah yang benar?

	Centre <i>Pusat</i>	Direction <i>Arah</i>
A	P	clockwise <i>ikut arah jam</i>
B	P	anti clockwise <i>lawan arah jam</i>
C	Q	clockwise <i>ikut arah jam</i>
D	Q	anti clockwise <i>lawan arah jam</i>

- 11 Diagram 5 shows two triangles, ABC and JKL , drawn on a Cartesian plane. Triangle ABC is the object of triangle JKL under an enlargement.

Rajah 5 menunjukkan dua segi tiga, ABC dan JKL , dilukis di atas satah Cartes. Segi tiga ABC ialah objek bagi segi tiga JKL di bawah suatu pembesaran.

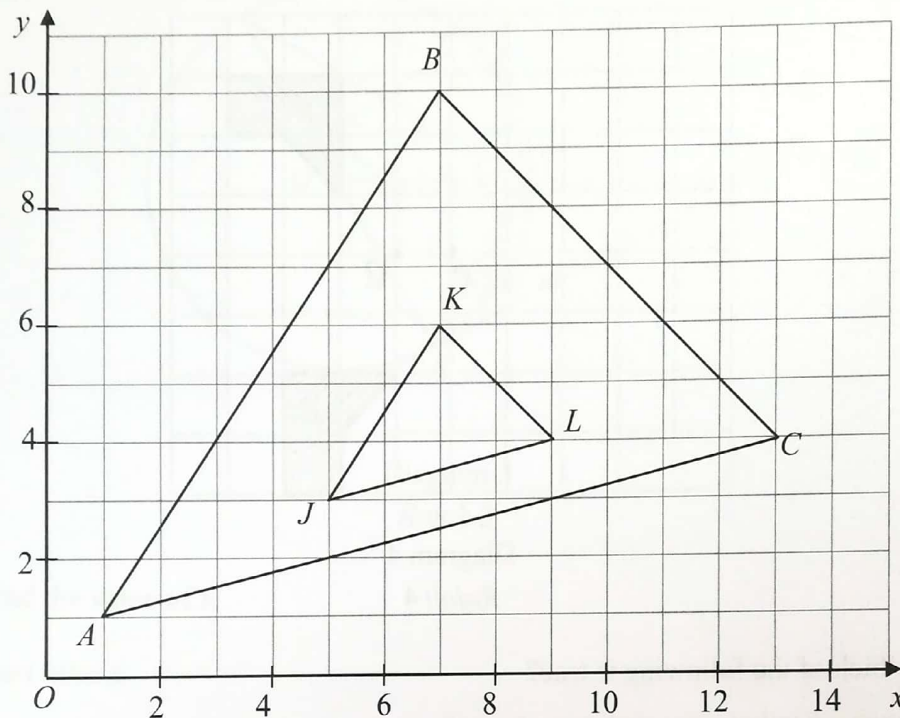


Diagram 5
Rajah 5

Find the centre and the scale factor of the enlargement.

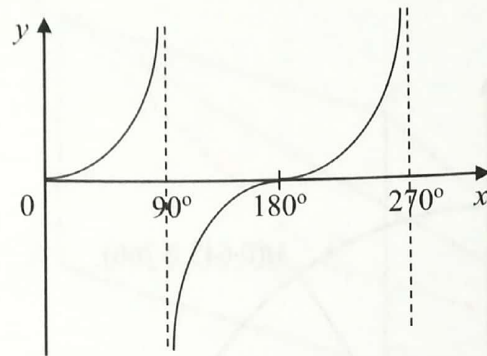
Cari pusat pembesaran dan faktor skala bagi pembesaran itu.

	Centre of enlargement <i>Pusat pembesaran</i>	Scale factor <i>Faktor skala</i>
A	(7, 4)	$\frac{1}{3}$
B	(7, 5)	$\frac{1}{3}$
C	(7, 4)	3
D	(7, 5)	3

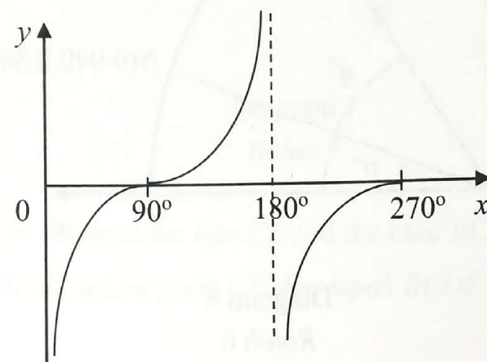
12 Which of the following represents the graph of $y = \tan x$ for $0^\circ \leq x \leq 270^\circ$?

Antara berikut, yang manakah mewakili graf $y = \tan x$ bagi $0^\circ \leq x \leq 270^\circ$?

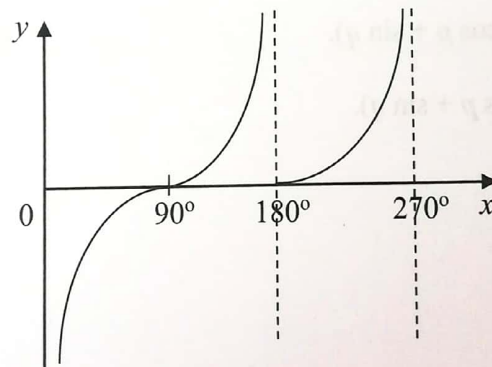
A



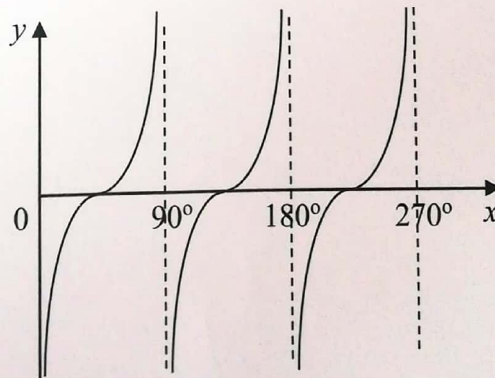
B



C



D



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- 13 In Diagram 6, point M and point N lie on the arc of a unit circle with centre O .

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

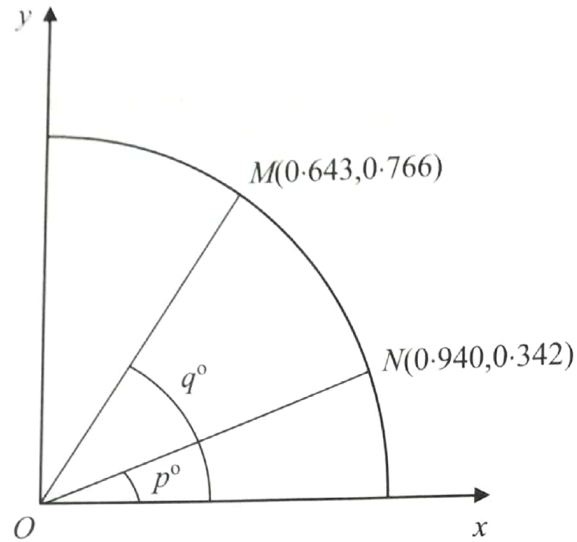


Diagram 6
Rajah 6

Find the value of $(\cos p + \sin q)$.

Cari nilai bagi $(\cos p + \sin q)$.

- A 0.985
- B 1.108
- C 1.583
- D 1.706

- 14 Diagram 7, shows a right prism $ABCDEF$ with a rectangular base $BCDF$.

Rajah 7, menunjukkan sebuah prisma tegak $ABCDEF$ dengan tapak segi empat tepat $BCDF$.

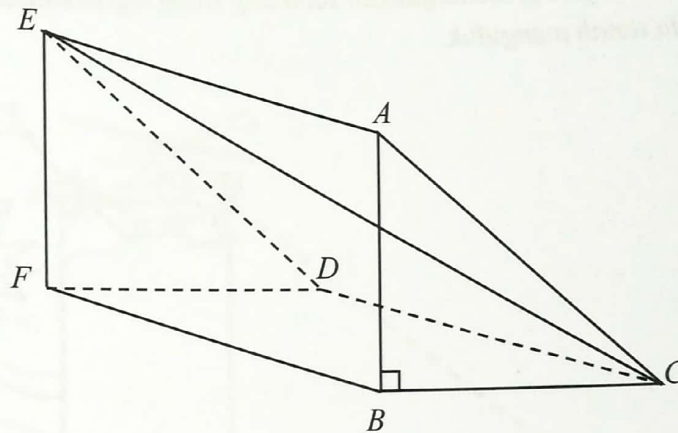


Diagram 7

Rajah 7

Name the angle between the line CE and the base $BCDF$.

Namakan sudut di antara garis CE dan tapak $BCDF$.

- A $\angle CEF$
- B $\angle ECB$
- C $\angle ECD$
- D $\angle ECF$

- 15 In Diagram 8, shows a Malaysia vertical pole, TS . R is a point on the horizontal ground.

Dalam Rajah 8, menunjukkan sebatang tiang tegak Malaysia, TS . R ialah titik pada tanah mengufuk.

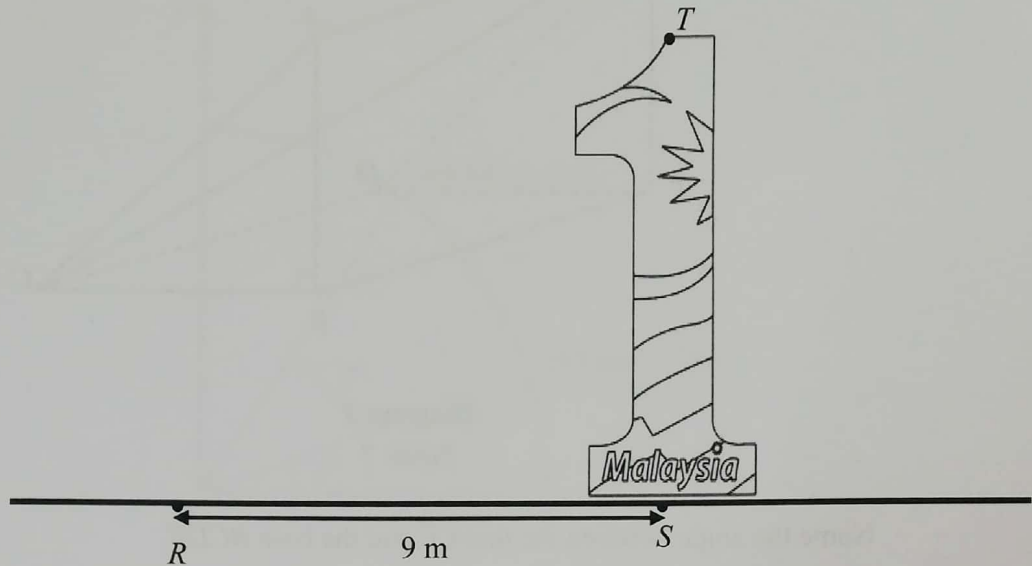


Diagram 8

Rajah 8

The angle of elevation of T from R is 42° . Calculate the height, in m, TS .

Sudut dongakan T dari R ialah 42° . Hitung tinggi, dalam m, TS .

- A 6.02
- B 6.69
- C 8.10
- D 10.00

- 16 In Diagram 9 shows that a point H on the helicopter. J and K are two points on the sea level.

Dalam Rajah 9, menunjukkan titik H pada sebuah helikopter. J dan K ialah dua titik pada paras laut.

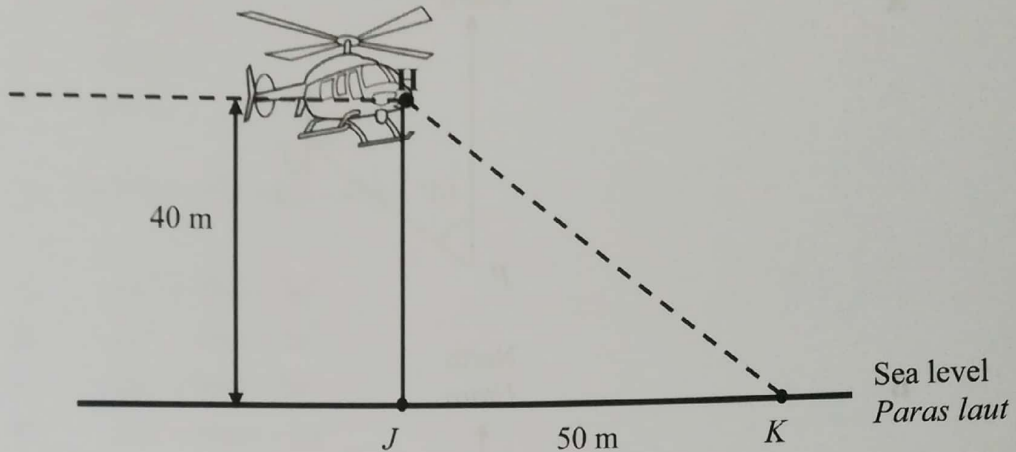


Diagram 9

Rajah 9

Calculate the angle of depression of point K from point H .

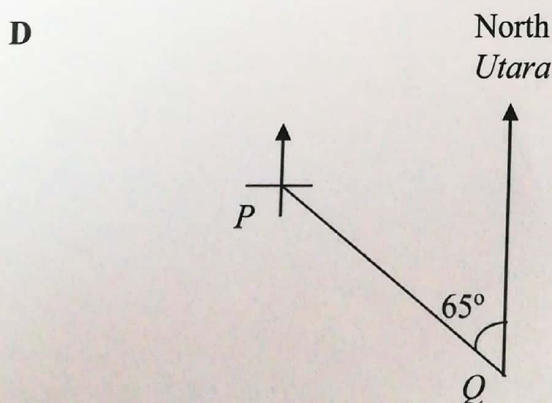
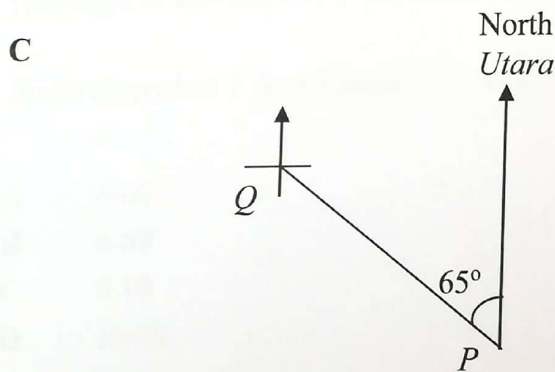
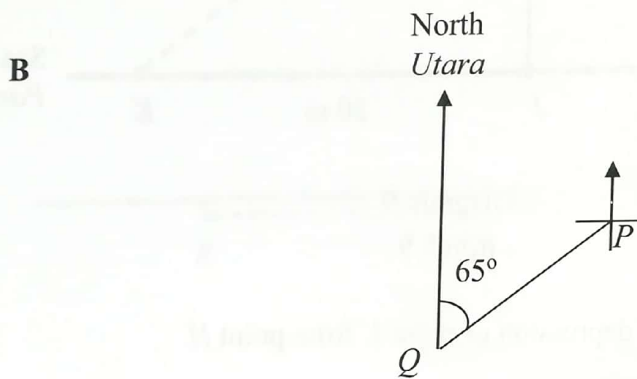
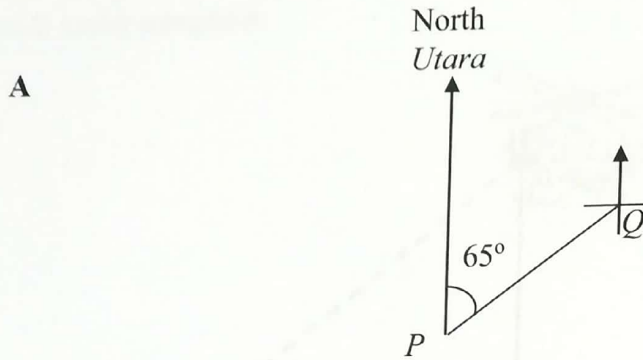
Hitung sudut tunduk titik K dari titik H .

- A $36^{\circ} 52'$
- B $38^{\circ} 40'$
- C $48^{\circ} 35'$
- D $51^{\circ} 20'$

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- 17 Point P and point Q lie on horizontal plane. The bearing of Q from P is 245° . Which of the following diagrams shows the positions of P and Q ?

Titik P dan titik Q terletak pada suatu satah mengufuk. Bearing Q dari P ialah 245° . Antara rajah berikut, yang manakah menunjukkan kedudukan P dan Q ?



- 18 G and H are two points on the same meridian and the latitude of G is 63°N . Given that H is located 21° due south of G , find the latitude of H .

G dan H ialah dua titik pada meridian yang sama dan latitud G ialah 63°U . Diberi bahawa H terletak 21° ke selatan G , cari latitud bagi H .

- A 42°S
- B 42°N/U
- C 84°N/U
- D 84°S

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

- A $2m^2 + 4mn - 2n^2$
- B $2m^2 - 4mn - 2n^2$
- C $2m^2 - 3mn + 2n^2$
- D $2m^2 - 10mn + 2n^2$

20 Express $\frac{8m + 8n}{4m} \div \frac{m^2 - n^2}{m^2}$, as a single fraction in its simplest form.

Ungkapkan $\frac{8m + 8n}{4m} \div \frac{m^2 - n^2}{m^2}$, sebagai satu pecahan tunggal dalam bentuk termudah.

- A $\frac{2m}{m - n}$
- B $\frac{2m}{m + n}$
- C $\frac{2m + 8mn}{m^2 - n^2}$
- D $\frac{4nm^2}{m^2 - n^2}$

- 21 Given $P = 6\left(\sqrt{\frac{1}{Q+R}}\right)$, express R in terms of P and Q .

Diberi bahawa $P = 6\left(\sqrt{\frac{1}{Q+R}}\right)$, ungkapkan R dalam sebutan P dan Q .

A $R = \frac{36}{P^2} - P^2 Q$

B $R = \frac{36}{P^2} - Q$

C $R = \frac{6}{P^2} - P^2 Q$

D $R = \frac{6}{P^2} - Q$

- 22 Given $2(k-1) = \frac{1}{3}(1-k) + 7$, find the value of k .

Diberi $2(k-1) = \frac{1}{3}(1-k) + 7$, cari nilai k .

A - 8

B - 4

C 4

D 8

23 $\left(\frac{27}{16}\right)^{-\frac{1}{3}}$

A $\left(\frac{16}{27}\right)^3$

B $\left(\frac{27}{16}\right)^3$

C $\frac{3}{\sqrt[3]{16}}$

D $\frac{\sqrt[3]{16}}{3}$

- 24 Simplify:
Ringkaskan:

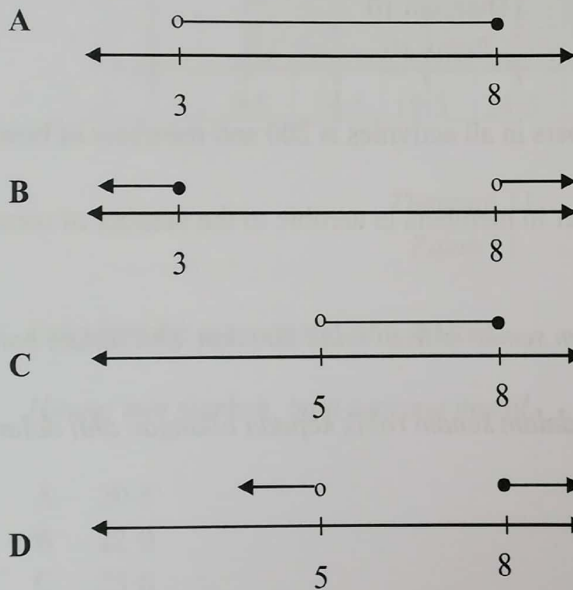
$$(mn^2)^4 \div (27m^3n^{-6})^{\frac{1}{3}}$$

- A $\frac{1}{3}n^{10}$
 B $\frac{1}{3}m^3n^{10}$
 C $3n^{10}$
 D $3m^5n^6$

- 25 Which of the following number lines represent the solutions for $5 - \frac{x}{2} \geq 1$ and $5(x-2) > 4x-5$?

Antara garis nombor berikut yang manakah mewakili penyelesaian ketaksamaan

$$5 - \frac{x}{2} \geq 1 \text{ dan } 5(x-2) > 4x-5?$$



- 26 Diagram 10 is a pie chart showing the number of members in five activities.

Rajah 10 ialah carta pai yang menunjukkan bilangan ahli dalam lima aktiviti.

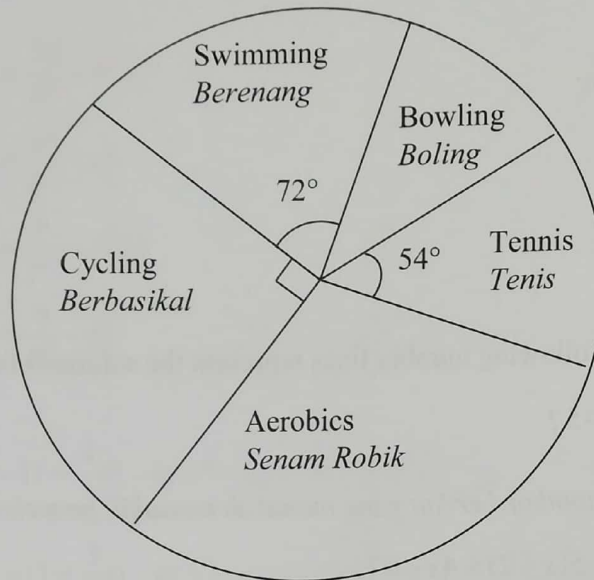


Diagram 10
Rajah 10

The total number of members in all activities is 200 and members of bowling are 20.

Find the ratio of the number in members in aerobic to the number of members in bowling.

Jumlah bilangan ahli dalam semua aktiviti ialah 200 dan ahli dalam boling ialah 20.

Cari nisbah bilangan ahli dalam senam robik kepada bilangan ahli dalam boling.

- A 3 : 1
- B 3 : 2
- C 4 : 3
- D 5 : 4

- 27 Diagram 11 is a bar chart showing the distribution of mark of 30 students in a Mathematics test.

Rajah 11 ialah carta palang yang menunjukkan taburan markah bagi 30 murid dalam ujian Matematik.

Number of students
Bilangan murid

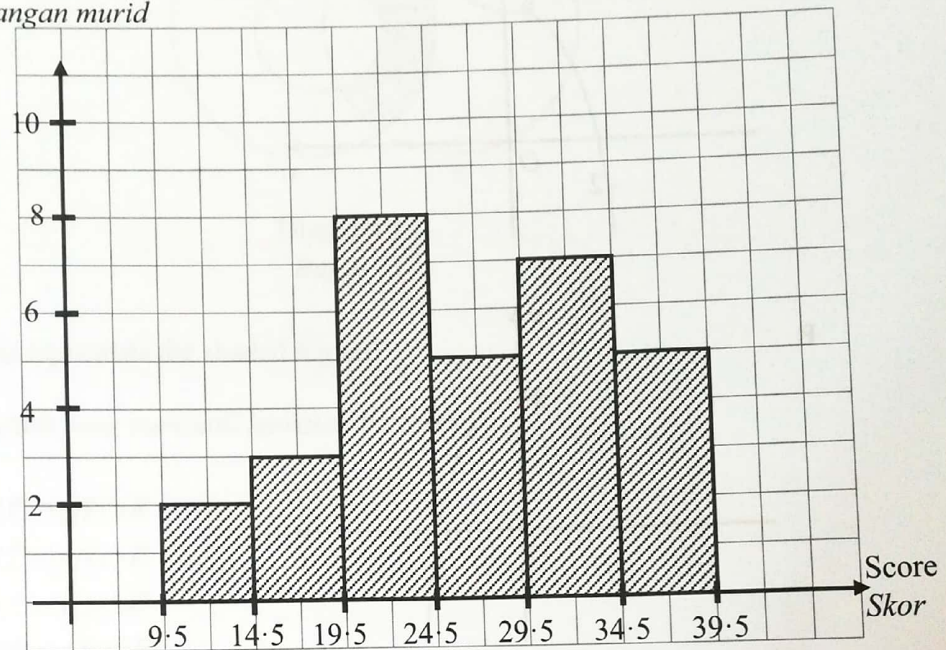


Diagram 11
Rajah 11

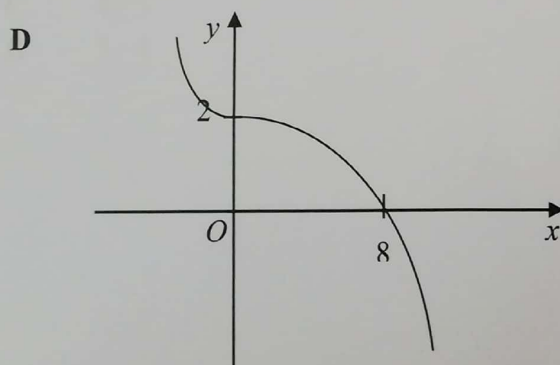
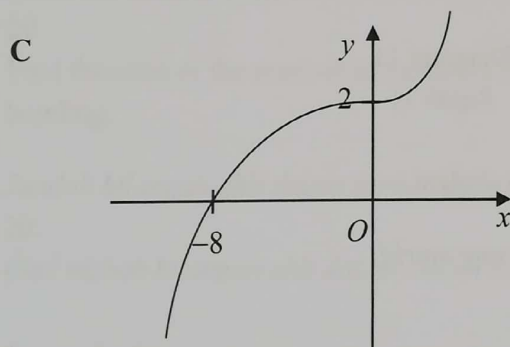
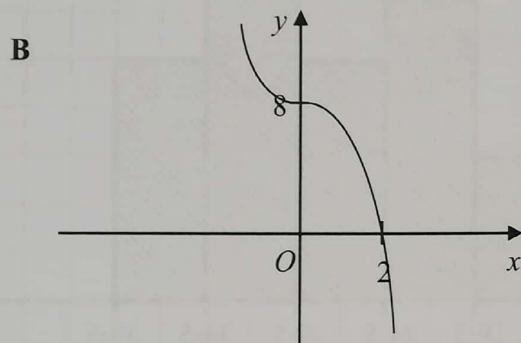
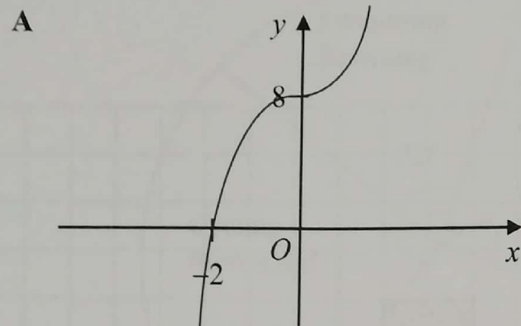
Calculate the mean mark, of a student.

Hitung min markah, bagi seorang murid.

- A 20.5
- B 22.0
- C 25.0
- D 26.5

28 Which graph represents $y - 8 = -x^3$?

Graf manakah yang mewakili $y - 8 = -x^3$?



- 29 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, $\xi = P \cup Q \cup R$.

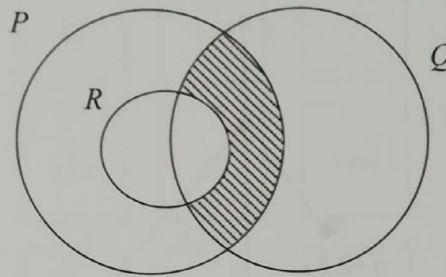


Diagram 12

Rajah 12

Which set represents the shaded region?

Set manakah yang mewakili kawasan berlorek?

- A $(P \cap Q)' \cap R$
 B $(P \cup Q)' \cap R$
 C $(P \cup Q) \cap R'$
 D $(P \cap Q) \cap R'$
- 30 It is given that the universal set, $\xi = \{x : 54 \leq x \leq 65, x \text{ is an integer}\}$,
 $M = \{x : x \text{ is a number such that contains digit 5}\}$ and $N = \{x : x \text{ is a number such that the sum of its two digits is an odd number}\}$.
 List all the elements of $M \cap N$.

Diberi bahawa set semesta, $\xi = \{x : 54 \leq x \leq 65, x \text{ ialah integer}\}$,
 $M = \{x : x \text{ ialah nombor dengan keadaan mengandungi digit 5}\}$ dan
 $N = \{x : x \text{ ialah nombor dengan keadaan hasil tambah dua digitnya ialah nombor ganjil}\}$.
 Senaraikan semua unsur bagi $M \cap N$.

- A $\{55, 57, 59\}$
 B $\{54, 56, 58, 65\}$
 C $\{54, 56, 58, 61, 63, 65\}$
 D $\{54, 55, 56, 57, 58, 59, 65\}$

- 31 Diagram 13 shows two straight lines ST and TU , on a Cartesian plane.

Rajah 13 menunjukkan dua garis lurus ST dan TU , pada suatu satah Cartes.

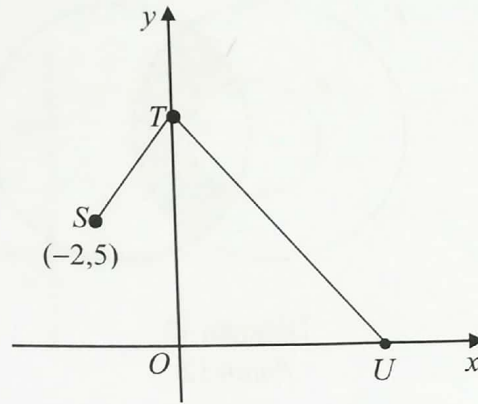


Diagram 13

Rajah 13

It is given that $TU = 17$ units and gradient of line ST is 5.
Find the x -intercept of TU .

Diberi bahawa $TU = 17$ unit dan kecerunan garis ST ialah 5.
Cari pintasan- x bagi TU .

- A 15
B 12
C 10
D 8
- 32 The gradient of the straight line $2y = mx + 5$ is $\frac{5}{4}$. Find the value of m .

Kecerunan bagi garis lurus $2y = mx + 5$ ialah $\frac{5}{4}$. Cari nilai m .

- A $\frac{5}{8}$
B $\frac{5}{2}$
C 8
D 10

33 Diagram 14 shows numbered cards in a box.

Rajah 14 menunjukkan kad-kad bernombor di dalam sebuah kotak.

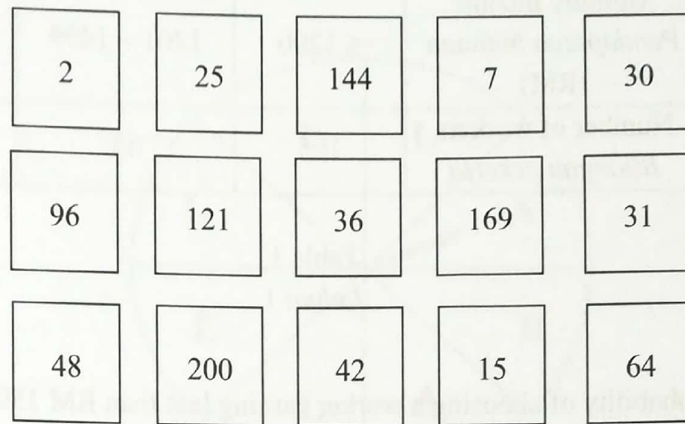


Diagram 14

Rajah 14

A card is chosen at random from the box.

Find the probability that the card chosen is perfect square number.

Satu kad dipilih secara rawak daripada kotak itu.

Cari kebarangkalian bahawa kad yang dipilih ialah nombor kuasa dua sempurna.

- A $\frac{1}{3}$
- B $\frac{2}{3}$
- C $\frac{1}{5}$
- D $\frac{2}{5}$

- 34 Table 1 shows the distribution of the monthly incomes of the group workers.

Jadual 1 menunjukkan taburan pendapatan bulanan bagi sekumpulan pekerja.

Monthly Income <i>Pendapatan bulanan</i> (RM)	≤ 1200	1201 – 1499	≥ 1500
Number of workers <i>Bilangan pekerja</i>	105	45	m

Table 1
Jadual 1

The probability of choosing a worker earning less than RM 1500 is $\frac{2}{3}$.

Find the value of m .

Kebarangkalian memilih pekerja berpendapatan kurang daripada RM 1500 ialah $\frac{2}{3}$.

Cari nilai m .

- A 15
- B 35
- C 50
- D 75

- 35 Diagram 15 shows a circular board which is divided into 8 equal sectors and labelled with letters.
Rajah 15 menunjukkan sekeping papan bulatan yang dibahagi kepada 8 sektor yang sama besar dan dilabel dengan huruf.

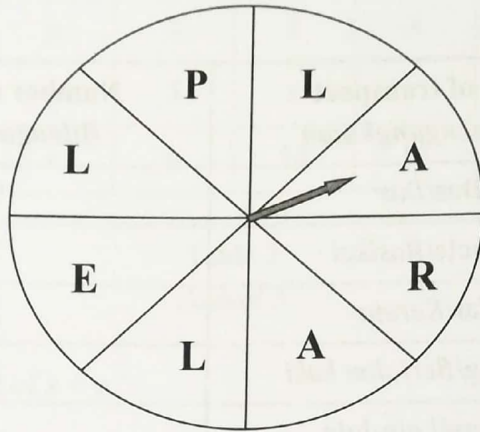


Diagram 15
Rajah 15

A pointer is placed at the centre of the board. The pointer is rotated about the centre of the board and will equally stop at any sector.
What is the probability that the pointer will **not** stopped in sectors labelled with a vowel?

*Satu jarum penunjuk itu diputar pada pusat papan itu dan akan berhenti di mana-mana sektor dengan kemungkinan yang sama.
Apakah kebarangkalian bahawa penunjuk itu **tidak** akan berhenti dalam sektor yang berlabel dengan huruf vokal?*

- A $\frac{1}{4}$
B $\frac{5}{8}$
C $\frac{3}{8}$
D $\frac{1}{8}$

- 36 Table 2 shows the surveys of 240 workers travel to factory.

Jadual 2 menunjukkan kaji selidik yang dijalankan ke atas 240 orang pekerja yang pergi ke kilang.

Type of transport <i>Jenis pengangkutan</i>	Number of workers <i>Bilangan pekerja</i>
Bus/ <i>Bas</i>	96
Bicycle/ <i>Basikal</i>	76
Car/ <i>Kereta</i>	36
Walking/ <i>Berjalan kaki</i>	20
Others/ <i>Lain-lain</i>	12

Table 2
Jadual 2

A worker is chosen at random from the group.

Find the probability that the worker travels to factory **not** by car.

Seorang pekerja dipilih secara rawak daripada kumpulan itu.

*Hitung kebarangkalian bahawa pekerja pergi ke kilang **tidak** dengan kereta.*

- A $\frac{1}{20}$
- B $\frac{3}{20}$
- C $\frac{17}{20}$
- D $\frac{18}{208}$

- 37 Table 3 shows three sets of values of p , q and r which satisfy $p \propto \frac{q}{r}$.

Jadual 3 menunjukkan tiga set bagi nilai p , q dan r yang memuaskan $p \propto \frac{q}{r}$.

p	2	2	x
q	3	x	y
r	6	14	12

Table 3
Jadual 3

Calculate the value of $x + y$.

Hitung nilai $x + y$.

- A 4
B 7
C 21
D 28
- 38 It is given that $R \propto S^m T^n$, where R varies directly as the square root of S and inversely as T .
State the value of m and of n .

Diberi bahawa $R \propto S^m T^n$, di mana R berubah secara langsung dengan punca kuasa dua S dan secara songsang dengan T .
Nyatakan nilai m dan nilai n .

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

- 39 Volume of a gas, $V \text{ m}^3$, varies inversely as the pressure, $P \text{ N/m}^2$. When the pressure of the gas is 0.08 N/m^2 , its volume is 40 m^3 .
Express V in terms of P .

*Isi padu suatu gas, $V \text{ m}^3$, adalah berubah secara songsang dengan tekanan, $P \text{ N/m}^2$. Bila tekanan gas ialah 0.08 N/m^2 , isipadunya ialah 40 m^3 .
Ungkapkan V dalam sebutan P .*

A $V = \frac{3200}{P}$

B $V = \frac{3.2}{P}$

C $V = 500P$

D $V = \frac{1}{500P}$

- 40 Given $A = \begin{pmatrix} 3 & -2 \\ 0 & 4 \end{pmatrix}$, find the matrix A^2 .

Diberi $A = \begin{pmatrix} 3 & -2 \\ 0 & 4 \end{pmatrix}$, cari matriks A^2 .

A $\begin{pmatrix} 9 & 2 \\ 0 & 16 \end{pmatrix}$

B $\begin{pmatrix} 9 & 4 \\ 0 & 16 \end{pmatrix}$

C $\begin{pmatrix} 9 & -14 \\ 0 & 16 \end{pmatrix}$

D $\begin{pmatrix} 6 & -4 \\ 0 & 8 \end{pmatrix}$

END OF QUESTION PAPER
KERTAS SOALAN TAMAT