

Jawab **semua** soalan.

- 1 Diberi bahawa ketinggian satu himpunan kertas ialah 510 mm dan ketebalan sehelai kertas ini dianggarkan 1.0×10^{-1} mm. Anggarkan bilangan helaian kertas dalam himpunan itu.

It is given that the height of a stack of paper is 510 mm and the thickness of a sheet of paper is approximately 1.0×10^{-1} mm. Estimate the number of sheets of papers in the stack.

A 5.1×10^1

B 5.1×10^2

C 5.1×10^3

D 5.1×10^4

- 2 Permudahkan :
Simplify :

$$\frac{(r^6 s^3)^{\frac{1}{3}}}{r^4}$$

A $r^{-2}s$

B $r^2 s^9$

C $r^{-2} s^9$

D r^2

- 3 Jadual 1 menunjukkan nilai bagi pemboleh ubah j dan m .
Table 1 shows the value of variables j and m .

j	p	q
m	r	6

Jadual 1 / Table 1

Diberi bahawa j berubah secara songsang dengan m dan nilai $p \times r$ ialah 24. Hitung nilai q .

Given that j varies inversely with m and the value of $p \times r$ is 24. Calculate the value of q .

A -4

C 4

B $-\frac{1}{4}$

D $\frac{1}{4}$

- 4 Jarak, d yang dilalui oleh sebuah basikal berubah secara langsung dengan kuasa dua laju, v dan secara songsang dengan pecutan, a . Diberi bahawa $d = 1600$ m, $v = 40 \text{ ms}^{-1}$ dan $a = 0.5 \text{ ms}^{-2}$. Hitung nilai a apabila $d = 4500$ m dan $v = 50 \text{ ms}^{-1}$.
The distance, d travelled by a bicycle varies directly with the square of the speed, v and inversely with the acceleration, a . Given that $d = 1600$ m, $v = 40 \text{ ms}^{-1}$ and $a = 0.5 \text{ ms}^{-2}$. Calculate the value of a when $d = 4500$ m and $v = 50 \text{ ms}^{-1}$.

A $\frac{1}{2}$

C $\frac{14}{18}$

B $\frac{5}{18}$

D $\frac{10}{18}$

- 5 Selesaikan : $3x - 2 < -5 - \frac{3}{4}x$
 Solve :

A $x < -\frac{4}{5}$

C $x < -\frac{2}{3}$

B $x > -\frac{4}{5}$

D $x > -\frac{2}{3}$

- 6 Diberi matriks $K = \begin{pmatrix} 5 & 0 & 2 \\ 7 & 4 & -3 \end{pmatrix}$, matriks $L = \begin{pmatrix} 14 & -2 & 1 \\ 13 & 18 & 10 \end{pmatrix}$ dan matriks $M = \begin{pmatrix} 10 & -8 & 4 \\ 6 & -11 & 7 \end{pmatrix}$. Hitung nilai $2K + L - M$.

Given matrix $K = \begin{pmatrix} 5 & 0 & 2 \\ 7 & 4 & -3 \end{pmatrix}$, matrix $L = \begin{pmatrix} 14 & -2 & 1 \\ 13 & 18 & 10 \end{pmatrix}$ and matrix $M = \begin{pmatrix} 10 & -8 & 4 \\ 6 & -11 & 7 \end{pmatrix}$. Calculate the value of $2K + L - M$.

A $\begin{pmatrix} 9 & 6 & -1 \\ 14 & 33 & 0 \end{pmatrix}$

C $\begin{pmatrix} 9 & -6 & 1 \\ 14 & 11 & 0 \end{pmatrix}$

B $\begin{pmatrix} 14 & -10 & -1 \\ 21 & -37 & -3 \end{pmatrix}$

D $\begin{pmatrix} 14 & 6 & 1 \\ 21 & 37 & -3 \end{pmatrix}$

- 7 Diberi $B = \begin{pmatrix} 5 & -2 \\ 1 & 6 \end{pmatrix}$ dan $BY = \begin{pmatrix} 11 \\ 15 \end{pmatrix}$.
 Given $B = \begin{pmatrix} 5 & -2 \\ 1 & 6 \end{pmatrix}$ and $BY = \begin{pmatrix} 11 \\ 15 \end{pmatrix}$.

Antara berikut, yang manakah **benar**?
 Which of the following is **true**?

	Peringkat matriks Y Order of matrix Y	Unsur Y_{11} . Element Y_{11} .
A	2×1	- 3
B	2×2	2
C	2×2	- 2
D	2×1	3

8 $\begin{pmatrix} 5 & 1 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} -2 \\ 4 \end{pmatrix} =$

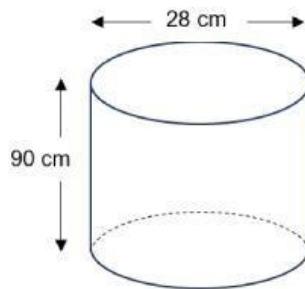
A $\begin{pmatrix} -10 & 4 \\ -6 & 16 \end{pmatrix}$

C $\begin{pmatrix} -6 \\ 10 \end{pmatrix}$

B $\begin{pmatrix} -10 & -2 \\ 12 & 16 \end{pmatrix}$

D $\begin{pmatrix} 14 \\ 22 \end{pmatrix}$

- 9 Rajah 1 menunjukkan sebuah silinder yang kosong dengan ketinggian 90 cm dan diameter 28 cm. Raziq memasukkan air ke dalam silinder itu sehingga penuh.
 Diagram 1 shows an empty cylinder with the height is 90 cm and the diameter 28 cm. Raziq fills up the cylinder full with water.



Rajah 1 / Diagram 1

Hitungkan isipadu air, dalam cm^3 , yang perlu dimasukkan ke dalam tiga bekas silinder yang sama saiz.

Calculate the volume of water, in cm^3 , needed to fill up three cylinders of the same size.

(Guna / Use $\pi = \frac{22}{7}$)

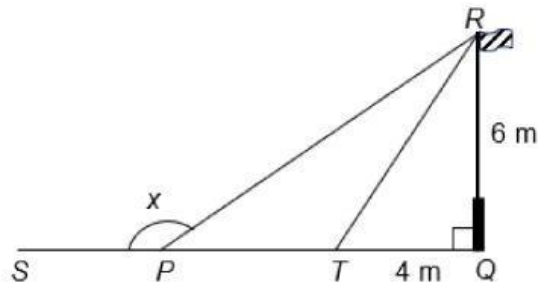
A 55 440

C 221 760

B 166 320

D 665 280

- 10 Dalam Rajah 2, QR ialah sebatang tiang bendera. $SPTQ$ ialah satu garis lurus.
In Diagram 2, QR is a flag pole. $SPTQ$ is a straight line.

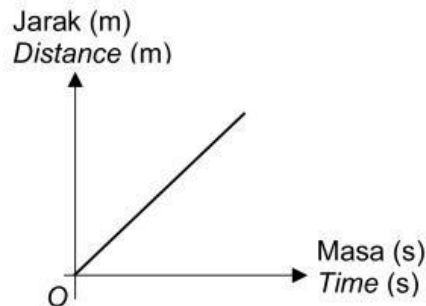


Rajah 2 / Diagram 2

Jika T ialah titik tengah bagi PQ , cari kos x .
If T is a midpoint of PQ , find $\cos x$.

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

- 11 Rajah 3 menunjukkan graf jarak-masa bagi suatu zarah.
Diagram 3 shows the distance-time graph of a particle.



Rajah 3 / Diagram 3

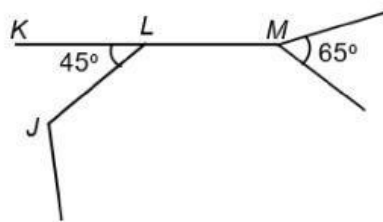
Graf menunjukkan bahawa
The graph indicates that

- | | |
|----------|---|
| A | zarah bergerak dengan laju seragam.
<i>the particle moves at a constant speed.</i> |
| B | zarah berada dalam keadaan pegun.
<i>the particle is stationary.</i> |
| C | zarah bergerak dengan kelajuan semakin bertambah.
<i>the particle moves with increasing speed.</i> |
| D | zarah bergerak dengan kelajuan berkurang.
<i>the particle moves with decreasing speed.</i> |

- 12 Sebuah kotak mengandungi 50 biji buah mangga. 15 daripadanya didapati sudah rosak. Apakah peratusan buah mangga rosak dalam kotak itu.
A box contains 50 mangoes. 15 of them were found to be damaged. What percentage of mangoes are spoiled in the box.

A	10 %	C	30 %
B	15 %	D	35 %

- 13 Rajah 4 menunjukkan JLM adalah sebahagian daripada poligon sekata. KLM ialah garis lurus.
Diagram 4 shows JLM is part of a regular polygon. KLM is a straight line.



Rajah 4 / Diagram 4

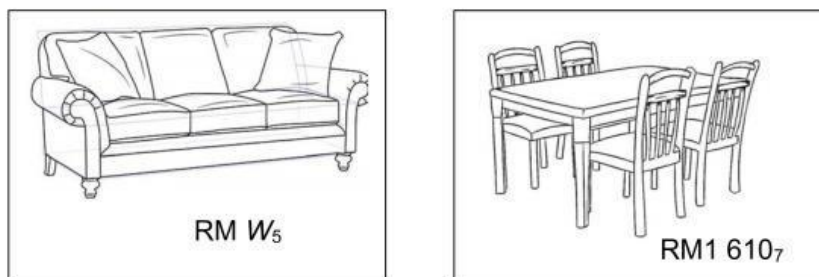
Cari bilangan sisi poligon tersebut.
Find the number of sides of the polygon.

A	5	C	7
B	6	D	8

- 14 Tentukan punca bagi persamaan kuadratik $2x^2 - x = 6$.
Find the root for the following quadratic equation $2x^2 - x = 6$.

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

- 15** Rajah 5 menunjukkan set sofa dan set meja makan yang dibeli oleh Puan Intan.
Diagram 5 shows the sofa set and dining table set purchased by Puan Intan.

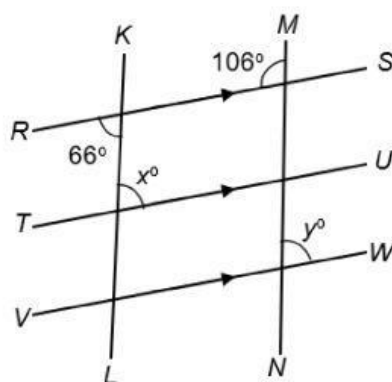


Rajah 5 / Diagram 5

Diberi bahawa jumlah harga kedua-dua set tersebut ialah RM1 364. Hitung nilai W .
Given that the total price of the two sets is RM1 364. Calculate the value of W .

- | | | | |
|----------|--------|----------|--------|
| A | 43 344 | C | 20 242 |
| B | 34 320 | D | 10 340 |

- 16** Rajah 6 menunjukkan tiga garis selari iaitu RS , TU dan VW . KL dan MN ialah garis lurus.
Diagram 6 shows three parallel lines, RS , TU and VW . KL and MN is a straight line.

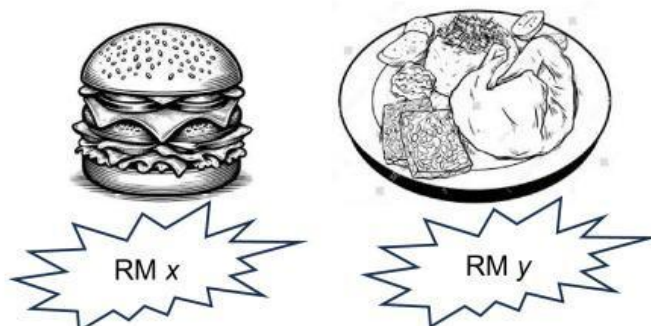


Rajah 6 / Diagram 6

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

- | | | | |
|----------|-----|----------|-----|
| A | 114 | C | 172 |
| B | 140 | D | 188 |

- 17 Rajah 7 menunjukkan harga bagi dua jenis makanan di sebuah kedai makan. Seorang pelanggan membayar RM30 untuk 3 set burger dan 4 set nasi ayam. *Diagram 7 shows the prices of two types of food at a restaurant. A customer pays RM30 for 3 sets of burgers and 4 sets of chicken rice.*



Rajah 7 / Diagram 7

Ungkapkan y dalam sebutan x .
Express y in terms of x .

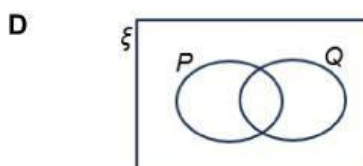
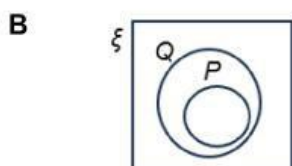
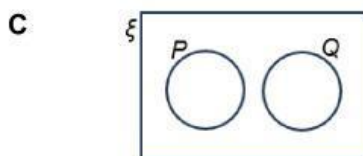
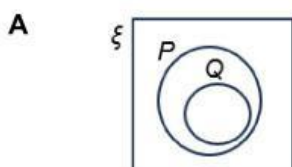
A $y = \frac{30 - 3x}{4}$

B $y = \frac{3x - 30}{4}$

C $y = \frac{30 - 4x}{3}$

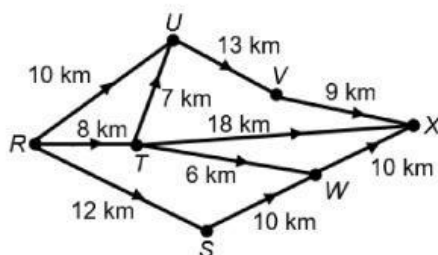
D $y = \frac{4x - 30}{3}$

- 18 Diberi bahawa set semesta, $\xi = \{2, 3, 4, 5, 6, 7, 8, 9, 10, 11\}$, set $P = \{\text{nombor genap}\}$ dan set $Q = \{\text{nombor perdana}\}$. Antara gambar rajah Venn berikut, yang manakah mewakili hubungan untuk set-set tersebut?
Given that universal set, $\xi = \{2, 3, 4, 5, 6, 7, 8, 9, 10, 11\}$, set $P = \{\text{even numbers}\}$ and set $Q = \{\text{prime numbers}\}$. Which of the following Venn diagrams represents the relationship for the sets?



- 19 Rajah 8 menunjukkan graf terarah dan berpemberat yang menghubungkan 7 buah kilang.

Diagram 8 shows a directed and weighted graph connecting 7 factories.



Rajah 8 / Diagram 8

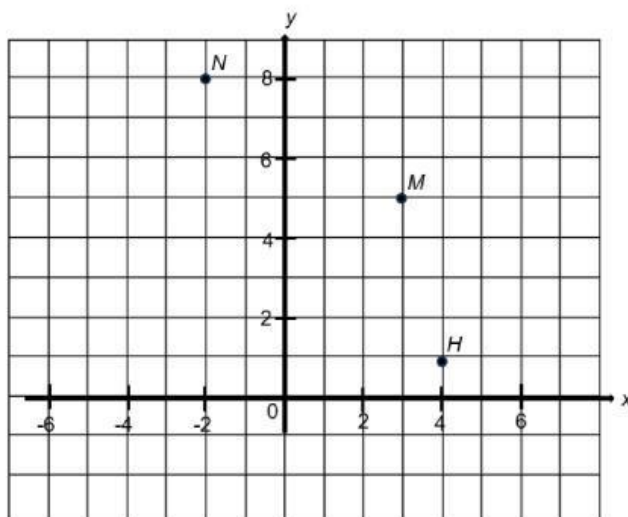
Aizam memandu van untuk menghantar barang dari kilang R ke kilang X. Tentukan laluan van Aizam, jika dia ingin menggunakan laluan yang terpendek untuk sampai ke kilang X.

Aizam drives a van to deliver goods from factory R to factory X. Determine the route of Aizam's van, if he wants to take the shortest route to reach factory X.

- | | | | |
|----------|---|----------|---|
| A | $R \rightarrow S \rightarrow W \rightarrow X$ | C | $R \rightarrow U \rightarrow V \rightarrow X$ |
| B | $R \rightarrow T \rightarrow W \rightarrow X$ | D | $R \rightarrow T \rightarrow X$ |

- 20 Rajah 9 menunjukkan objek M dipetakan kepada kedudukan N di bawah suatu translasi.

Diagram 9 shows object M is mapped onto position N under a translation.



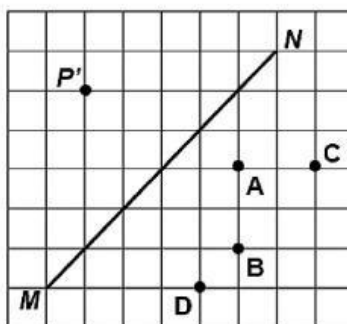
Rajah 9 / Diagram 9

Tentukan kedudukan imej bagi H di bawah translasi yang sama.

Determine the position of image H under the same translation.

- | | | | |
|----------|-----------|----------|-----------|
| A | $(4, -1)$ | C | $(-1, 4)$ |
| B | $(1, -4)$ | D | $(-4, 1)$ |

- 21 Dalam Rajah 10, MN ialah garis lurus.
In Diagram 10, MN is a straight line.



Rajah 10 / Diagram 10

Antara titik **A**, **B**, **C** dan **D**, yang manakah ialah objek bagi imej P' di bawah pantulan pada garis MN ?

*Among points **A**, **B**, **C** and **D**, which is the object for image P' under a reflection on line MN ?*

- 22 Berikut menunjukkan sebahagian daripada suatu hujah.
The following shows part of an argument.

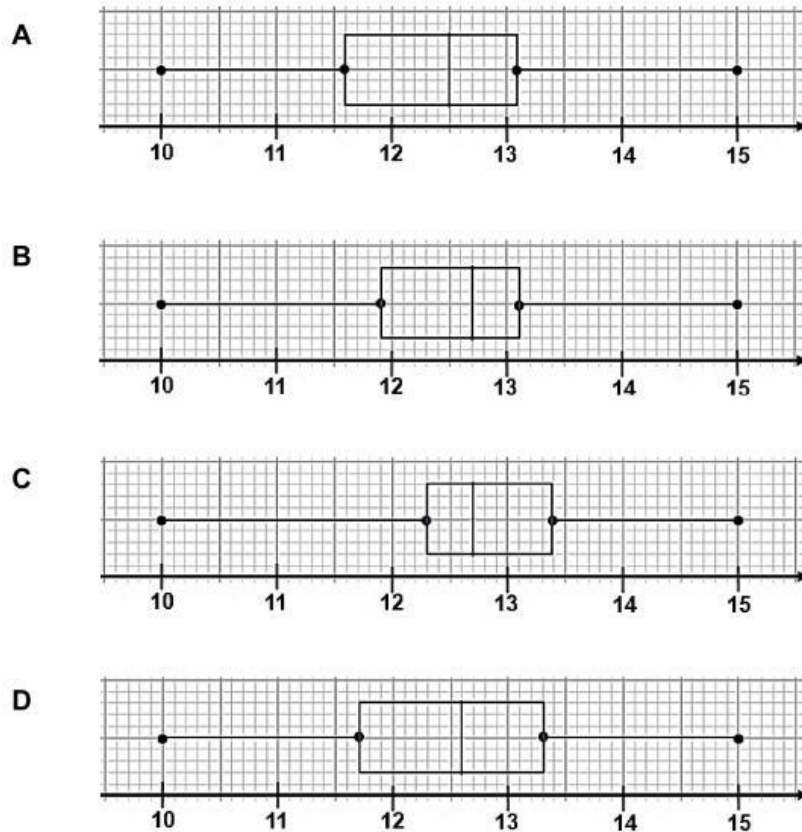
Premis 1	: Hasil tambah sudut pedalaman poligon n sisi ialah $(n - 2) \times 180^\circ$.
Premise 1	: <i>The sum of interior angles of a n-sided polygon is $(n - 2) \times 180^\circ$.</i>
Premis 2	: W ialah sebuah poligon 7 sisi.
Premise 2	: <i>W is a 7-sided polygon.</i>

Tentukan hasil tambah sudut pedalaman poligon W .

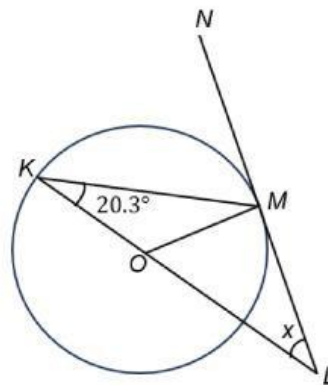
Determine the sum of interior angles of polygon W .

- | | | | |
|----------|-------------|----------|-------------|
| A | 900° | C | 540° |
| B | 720° | D | 360° |

- 23 Julat antara kuartil yang diperolehi daripada satu ogif ialah 1.6. Seorang murid melukis satu plot kotak berdasarkan ogif tersebut. Antara berikut, yang manakah plot kotak yang betul dilukis oleh murid itu?
The interquartile range obtained from an ogive is 1.6. A student draws a box plot based on the ogive. Which of the following is the correct box plot drawn by the student?



- 24** Rajah 11 menunjukkan sebuah bulatan berpusat di O . LMN ialah tangen kepada bulatan. Diberi $\angle LKM = 20.3^\circ$ dan KOL ialah garis lurus.
Diagram 11 shows a circle centered at O . LMN is tangent to the circle. Given that $\angle LKM = 20.3^\circ$ and KOL is a straight line.

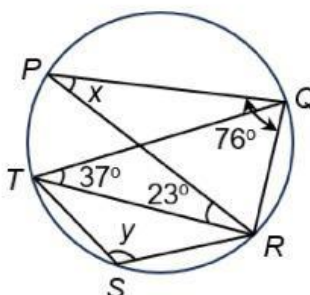


Rajah 11 / Diagram 11

Cari nilai x .
Find the value of x .

- | | | | |
|----------|----------------|----------|----------------|
| A | $49^\circ 24'$ | C | $49^\circ 42'$ |
| B | $59^\circ 42'$ | D | $59^\circ 24'$ |

- 25 Rajah 12 menunjukkan sebuah bulatan $PQRST$.
Diagram 12 shows a circle $PQRST$.



Rajah 12 / Diagram 12

Hitung nilai $x + y$.

Calculate the value of $x + y$.

- | | | | |
|----------|-------------|----------|-------------|
| A | 87° | C | 136° |
| B | 104° | D | 164° |

- 26 Jadual 2 menunjukkan kadar premium tahunan per RM1 000 nilai muka insurans hayat boleh baharu yang ditawarkan oleh sebuah syarikat insurans.
Table 2 shows the annual premium rate per RM1 000 face value of renewable life insurance offered by an insurance company.

Umur Age	Lelaki / Male (RM)		Perempuan / Female (RM)	
	Bukan Perokok Non-smoker	Perokok Smoker	Bukan Perokok Non-smoker	Perokok Smoker
25	2.11	2.70	1.15	1.37
26	2.12	2.70	1.16	1.37
27	2.12	2.71	1.17	1.39
28	2.13	2.73	1.19	1.42

Jadual 2 / Table 2

Dengan nilai muka RM150 000. Hitung premium tahunan bagi seorang perempuan berumur 26 tahun yang merokok.

Based on the face value of RM150 000. Calculate the annual premium for a 26 years old woman who does smoke.

- | | | | |
|----------|----------|----------|----------|
| A | RM205.00 | C | RM405.00 |
| B | RM205.50 | D | RM405.50 |

- 27 Encik Rashid telah membuat pinjaman peribadi sebanyak RM50 000 daripada sebuah bank. Pihak bank telah mengenakan kadar faedah 5% setahun. Hitung bayaran ansuran bulanan jika tempoh pinjaman ialah 9 tahun.

Encik Rashid has made a personal loan of RM50 000 from a bank. The bank has charged an interest rate of 5% per annum. Calculate the monthly installment if the loan period is 9 years.

- | | | | |
|----------|----------|----------|------------|
| A | RM208.33 | C | RM1 875.00 |
| B | RM671.30 | D | RM2 500.00 |

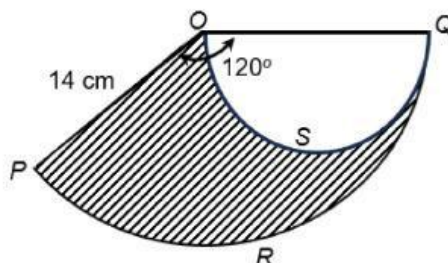
- 28 Ungkapkan $\frac{2x+6}{y-3} \div \frac{2(x+3)^2}{y^2-9}$ sebagai pecahan tunggal dalam bentuk termudah.

Express $\frac{2x+6}{y-3} \div \frac{2(x+3)^2}{y^2-9}$ as a single fraction in its simplest form.

- | | | | |
|----------|-------------------|----------|-------------------|
| A | $\frac{y+3}{x+3}$ | C | $\frac{y-3}{x+3}$ |
| B | $\frac{x+3}{y+3}$ | D | $\frac{y-3}{x-3}$ |

- 29 Rajah 13 menunjukkan sebuah sektor OPRQ bagi bulatan yang berpusat di O dan OQS ialah sebuah semibulatan.

Diagram 13 shows a sector OPRQ of a circle with centre O and OQS is a semicircle.



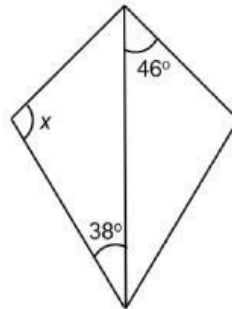
Rajah 13 / Diagram 13

Hitung luas kawasan yang berlorek.

Calculate the area of the shaded region.

- | | | | |
|----------|-----------------|----------|------------------|
| A | $21\frac{1}{3}$ | C | $128\frac{1}{3}$ |
| B | $57\frac{1}{3}$ | D | $205\frac{1}{3}$ |

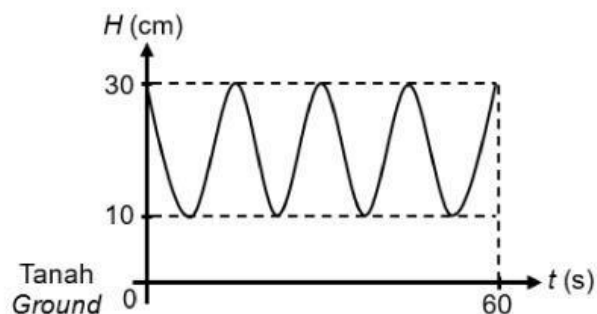
- 30 Rajah 14 menunjukkan satu lelayang.
Diagram 14 shows a kite.



Rajah 14 / Diagram 14

Cari nilai x .
Find the value of x .

- | | | | |
|----------|------------|----------|-------------|
| A | 84° | C | 96° |
| B | 88° | D | 104° |
- 31 Rajah 15 menunjukkan suatu graf fungsi trigonometri yang mewakili tinggi pedal basikal daripada tanah, H dengan masa, t .
Diagram 15 shows a trigonometric function that represents the height of the bicycle pedal from the ground, H and with, t .



Rajah 15 / Diagram 15

Apakah fungsi trigonometri yang mewakili graf itu?
What is the trigonometric function that represents the graph?

- | | | | |
|----------|--|----------|--|
| A | $H = 20 \cos 60t + 10$
$H = 20 \cos 60t + 10$ | C | $H = 20 \sin 60t + 10$
$H = 20 \sin 60t + 10$ |
| B | $H = 10 \cos 24t + 20$
$H = 10 \cos 24t + 20$ | D | $H = 10 \sin 24t + 20$
$H = 10 \sin 24t + 20$ |

- 32 Diberi $\sin x = 0.7071$ dan $0^\circ \leq x \leq 360^\circ$. Hitung nilai x .
Given $\sin x = 0.7071$ and $0^\circ \leq x \leq 360^\circ$. Calculate the value of x .

A $45^\circ, 135^\circ$ C $135^\circ, 225^\circ$
 B $45^\circ, 225^\circ$ D $135^\circ, 315^\circ$

- 33 Jadual 3 menunjukkan skor bagi sekumpulan murid dalam satu kuiz matematik.
Table 3 shows the scores of a group of pupils in a mathematics quiz.

Skor Score	5	6	7	8	9	10
Kekerapan Frequency	7	11	5	9	10	8

Jadual 3 / Table 3

Cari skor median.
Find the median score.

A 6 C 7.5
 B 7 D 8

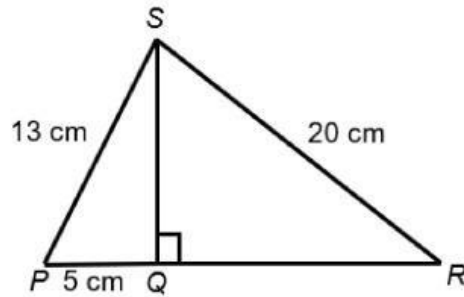
- 34 Sebuah peta dilukis dengan skala 1: 30 000. Jika panjang sebenar sebatang sungai ialah 4.2 km, hitung panjang sungai itu, dalam cm, pada peta tersebut.
A map is drawn to a scale of 1: 30 000. If the actual length of a river is 4.2 km, calculate the length of the river, in cm, on the map.

A 12.6 C 25.2
 B 14.0 D 28.0

- 35 Tentukan persamaan garis lurus yang melalui titik $(6, -1)$ dan selari dengan garis lurus $4x + 7y = 28$.
Determine the equation of a straight line parallel to the straight line $4x + 7y = 28$ and passes through point $(6, -1)$.

A $7y = -4x + 17$ C $7y = -4x + 25$
 B $y = -\frac{4}{7}x + 25$ D $y = -\frac{4}{7}x + 17$

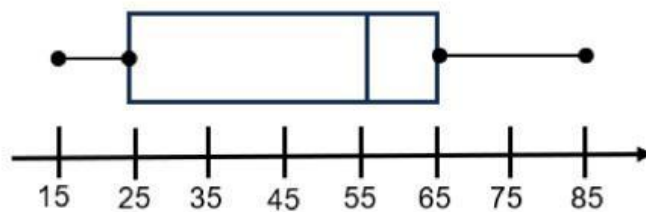
- 36 Rajah 16 menunjukkan dua buah segi tiga bersudut tegak SPQ dan SQR .
Diagram 16 shows two right-angled triangles SPQ and SQR .



Rajah 16 / Diagram 16

Hitung panjang PR .
Calculate the length of PR .

- | | | | |
|----------|-------|----------|-------|
| A | 12 cm | C | 21 cm |
| B | 16 cm | D | 32 cm |
- 37 Rajah 17 menunjukkan sebuah plot kotak.
Diagram 17 shows a box plot.



Rajah 17 / Diagram 17

Nyatakan nilai kuartil ketiga.
State the value of third quartile.

- | | | | |
|----------|----|----------|----|
| A | 25 | C | 55 |
| B | 40 | D | 65 |