

**RUMUS MATEMATIK
MATHEMATICAL FORMULAE**

**NOMBOR DAN OPERASI
NUMBERS AND OPERATIONS**

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 $a^{\frac{1}{n}} = \sqrt[n]{a}$

5 $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}} = \left(a^{\frac{1}{n}}\right)^m$

6 $a^{\frac{m}{n}} = \sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m$

7 Faedah mudah / *Simple interest*, $I = Prt$

8 Nilai matang / *Maturity value*, $MV = P\left(1 + \frac{r}{n}\right)^{nt}$

9 Jumlah bayaran balik / *Total repayment*, $A = P + Prt$

10
$$\text{Premium} = \frac{\text{Nilai muka polisi}}{\text{RMx}} \times (\text{Kadar premium per RMx})$$

$$\text{Premium} = \frac{\text{Face value of policy}}{\text{RMx}} \times (\text{Premium rate per RMx})$$

11 Jumlah insurans yang harus dibeli = (Peratusan ko - insurans) $\times$ (Nilai boleh insurans harta)
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**PERKAITAN DAN ALGEBRA
RELATIONSHIP AND ALGEBRA**

1 Jarak / *Distance* = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

4 $m = \frac{y_2 - y_1}{x_2 - x_1}$

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

5 $A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$

3 Laju purata = $\frac{\text{Jumlah jarak}}{\text{Jumlah masa}}$
Average speed = $\frac{\text{Total distance}}{\text{Total time}}$

6 $m = -\frac{\text{pintasan} - y}{\text{pintasan} - x}$
 $m = -\frac{y - \text{intercept}}{x - \text{intercept}}$

SUKATAN DAN GEOMETRI
MEASUREMENT AND GEOMETRY

- 1 Teorem Pythagoras / Pythagoras Theorem , $c^2 = a^2 + b^2$
- 2 Hasil tambah sudut pedalaman poligon / *Sum of interior angles of a polygon*
 $= (n - 2) \times 180^\circ$
- 3 Lilitan bulatan = $\pi d = 2 \pi j$
Circumference of circle = $\pi d = 2 \pi r$
- 4 Luas bulatan = πj^2
Area of circle = πr^2
- 5
$$\frac{\text{Panjang lengkok}}{2 \pi j} = \frac{\theta}{360^\circ}$$

$$\frac{\text{Arc length}}{2 \pi r} = \frac{\theta}{360^\circ}$$
- 6
$$\frac{\text{Luas sektor}}{\pi j^2} = \frac{\theta}{360^\circ}$$

$$\frac{\text{Area of sector}}{\pi r^2} = \frac{\theta}{360^\circ}$$
- 7 Luas layang = $\frac{1}{2} \times$ hasil darab panjang dua pepenjuru
Area of kite = $\frac{1}{2} \times$ product of two diagonals
- 8 Luas trapezium = $\frac{1}{2} \times$ hasil tambah dua sisi selari $\times$ tinggi
Area of trapezium = $\frac{1}{2} \times$ sum of parallel sides $\times$ height
- 9 Luas permukaan silinder = $2 \pi j^2 + 2 \pi jt$
Surface area of cylinder = $2 \pi r^2 + 2 \pi rh$
- 10 Luas permukaan kon = $\pi j^2 + \pi js$
Surface area of cone = $\pi j^2 + \pi js$
- 11 Luas permukaan sfera = $4 \pi j^2$
Surface area of sphere = $4 \pi j$
- 12 Isi padu prisma = luas keratan rentas $\times$ tinggi
Volume of prism = area of cross section $\times$ height
- 13 Isi padu silinder = $\pi j^2 t$
Volume of cylinder = $\pi r^2 h$
- 14 Isi padu kon = $\frac{1}{3} \pi j^2 t$
Volume of cone = $\frac{1}{3} \pi r^2 h$

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- 15 Isi padu sfera = $\frac{4}{3} \pi r^3$
 Volume of sphere = $\frac{4}{3} \pi r^3$
- 16 Isi padu piramid = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
 Volume of pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
- 17 Faktor skala, $k = \frac{PA'}{PA}$
 Scale factor, k = $\frac{PA'}{PA}$
- 18 Luas imej = $k^2 \times \text{luas objek}$
 Area of image = $k^2 \times \text{area of object}$

STATISTIK DAN KEBARANGKALIAN
STATISTICS AND PROBABILITY

- 1 Min / Mean = $\bar{x} = \frac{\sum x}{N}$
- 2 Min / Mean = $\bar{x} = \frac{\sum fx}{f}$
- 3 Varians / Variance, $\sigma^2 = \frac{\sum (x - \bar{x})^2}{N} = \frac{\sum x^2}{N} - \bar{x}^2$
- 4 Varians / Variance, $\sigma^2 = \frac{\sum f(x - \bar{x})^2}{\sum f} = \frac{\sum fx^2}{\sum f} - \bar{x}^2$
- 5 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$
- 6 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}} = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$
- 7 $P(A) = \frac{n(A)}{n(S)}$
- 8 $P(A') = 1 - P(A)$

- 1 Rajah 1 menunjukkan suatu jujukan nombor.

Diagram 1 shows a number sequence.

1, 5, 6, x , 17, 28, y .

Rajah 1
Diagram 1

Hitung nilai x dan nilai y .

Find the values of x and of y .

A $x = 11, y = 45$

B $x = 11, y = 39$

C $x = 12, y = 45$

D $x = 12, y = 39$

- 2 Jadual 1 menunjukkan rekod jualan makanan di sebuah kedai pada suatu hari tertentu.

Table 1 shows the sales record of food in a store on a certain day.

Makanan Sejuk Beku <i>Frozen Food</i>	Bilangan Pek <i>Number of Pack</i>
Nugget <i>Nugget</i>	150
Piza <i>Pizza</i>	120

Jadual 1

Table 1

Cari nisbah bilangan pek nugget kepada pek piza.

Find the ratio of the number of packs of nugget to the number of packs of pizza.

A 3 : 5

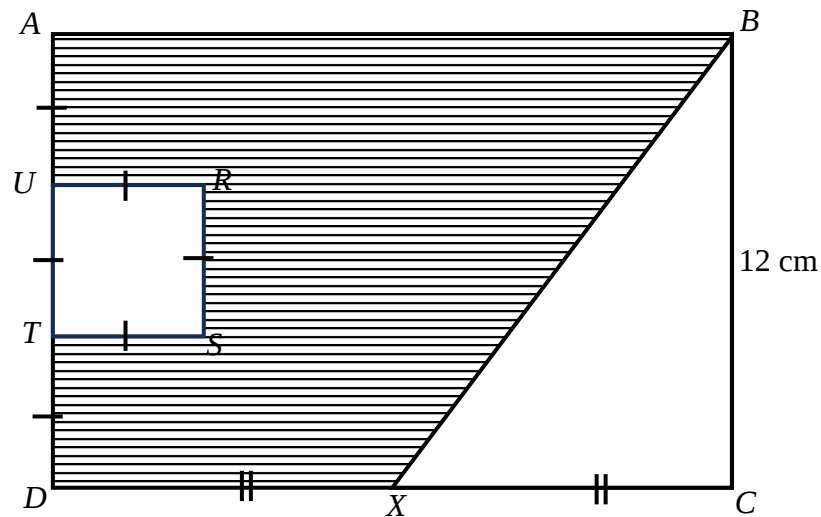
B 4 : 5

C 5 : 3

D 5 : 4

- 3 Dalam Rajah 2, $ABCD$ ialah sebuah segiempat tepat dan $RSTU$ ialah sebuah segiempat sama.

In the Diagram 2, $ABCD$ is a rectangle and $RSTU$ is a square.



Rajah 2
Diagram 2

Diberi $BX = 15$ cm.

Cari perimeter kawasan berlorek, dalam cm.

Given that $BX = 15$ cm.

Find the perimeter of the shaded region, in cm.

- A** 54
- B** 62
- C** 66
- D** 74

- 4 Suhaimi membuat pinjaman kenderaan sebanyak RM90 000 daripada sebuah bank dengan kadar faedah sebanyak 2.7% setahun.

Hitung jumlah bayaran balik pinjaman jika tempoh pinjaman ialah 9 tahun.

Suhaimi made a car loan of RM90 000 from a bank with the interest rate of 2.7% per annum.

Calculate the total instalment if the loan period is 9 years.

- A RM1 035.83
- B RM12 430.00
- C RM21 870.00
- D RM111 870.00

- 5 Tukarkan 3421_7 dalam asas lima.

Convert 3421_7 in base five.

- A 1240_5
- B 1443_5
- C 12400_5
- D 14430_5

6 Jadual 2 menunjukkan bilangan guli di dalam tiga bekas.

Bilangan guli di dalam bekas T tidak ditunjukkan.

Table 2 shows the number of marbles in three containers.

The number of marbles in container T is not shown.

Bekas <i>Container</i>	Bilangan guli <i>Number of marbles</i>
R	32_7
S	221_4
T	

Jadual 2

Table 2

Bilangan guli di dalam bekas T adalah yang paling banyak.

Berapakah bilangan guli yang mungkin di dalam bekas T ?

The number of marbles in container T is the greatest.

What is the possible number of marbles in container T ?

A 23_8

B 35_6

C 203_5

D 213_4

7 Antara berikut yang manakah tidak benar?

Which of the following is not true?

	Pihak berkuasa <i>Authority</i>	Cukai <i>Tax</i>
A	Jabatan Kastam Diraja Malaysia <i>Royal Malaysian Customs Department</i>	Cukai Jualan dan Perkhidmatan <i>Sales and Service Tax</i>
B	Majlis perbandaran atau majlis daerah <i>Municipal council or district council</i>	Cukai Tanah <i>Quit Rent</i>
C	Lembaga Hasil Dalam Negeri <i>Inland Revenue Board</i>	Cukai Pendapatan <i>Income Tax</i>
D	Jabatan Pengangkutan Jalan <i>Road Transport Department</i>	Cukai Jalan <i>Road Tax</i>

8 Areefa memiliki sebuah rumah kediaman di Kangar Jaya. Dia menerima bil cukai pintu daripada Majlis Perbandaran Kangar. Diberi bahawa nilai tahunan ialah RM6 440 dan kadar cukai pintu ialah 8%.

Hitung cukai pintu yang perlu dibayar oleh Areefa untuk setiap setengah tahun.

Areefa owns a residential house in Kangar Jaya. She receives property assessment tax bill from Kangar Municipal Council. It is given that the annual value is RM6 440 and the property assessment tax rate is 8%.

Calculate the property assessment tax payable by Areefa for each half-year.

A RM515.20

B RM257.60

C RM128.80

D RM85.87

- 9 Rajah 3 menunjukkan maklumat kenderaan Firdaus yang ingin diinsuranskan di Pulau Pinang. Jadual 3 menunjukkan kadar yang dikenakan bagi RM1 000 yang pertama daripada jumlah yang diinsuranskan bagi polisi komprehensif.

Diagram 3 shows the information of Firdaus's car that needs to be insured in Pulau Pinang. Table 3 shows the rate charged for the first RM1 000 of the sum insured for comprehensive policy.

Jumlah yang ingin diinsuranskan	
<i>Sum insured</i>	RM70 000
Kapasiti enjin	
<i>Engine capacity</i>	2500 cc
NCD	25%

Rajah 3
Diagram 3

Kapasiti enjin (tidak melebihi cc) <i>Engine capacity (not exceeding cc)</i>	Polisi komprehensif <i>Comprehensive policy</i> (RM)
2 200	339.10
3 050	372.60

Jadual 3
Table 3

Hitung premium kasar bagi kereta Firdaus untuk polisi insuran komprehensif.

[Rumus mengira premium asas polisi komprehensif bagi Semenanjung Malaysia = Kadar bagi RM1 000 yang pertama + RM26 bagi setiap RM1 000 atau sebahagian daripada itu bagi nilai yang melebihi RM1 000 yang pertama.]

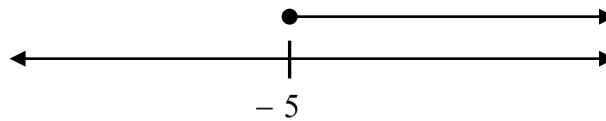
Calculate the gross premium of Firdaus's car under the comprehensive policy?

[The formulae to calculate the basic premium of the comprehensive policy for Peninsular Malaysia = Rate for the first RM1 000 + RM26 for each RM1 000 or part thereof on value exceeding the first RM1 000.]

- A RM2 166.60
- B RM1 794.00
- C RM1 599.83
- D RM1 624.95

- 10 Rajah 4 menunjukkan satu garis nombor yang mewakili penyelesaian bagi satu ketaksamaan.

Diagram 4 shows a number line represents the solution of an inequality.



Rajah 4
Diagram 4

Tentukan ketaksamaan itu.

Determine the inequality.

- A** $x + 18 \geq 2x + 13$
- B** $x - 18 \geq 3x - 8$
- C** $x \leq 3x + 10$
- D** $x \leq 2x - 5$
- 11 Diberi bahawa $\frac{5y-6}{3} = y + 4$.

Cari nilai y .

It is given that $\frac{5y-6}{3} = y + 4$.

Find the value of y .

- A** 2
- B** 3
- C** 5
- D** 9

- 12 Jarak antara Padang Besar dan Ipoh ialah x km. Sebuah kereta bergerak dari Padang Besar ke Ipoh dengan laju purata 90 km/j. Laju purata bagi perjalanan pulang dari Ipoh ke Padang Besar ialah 105 km/j. Masa yang diambilnya berkurang sebanyak 30 minit.

Hitung nilai x .

The distance between Padang Besar and Ipoh is x km. A car travels from Padang Besar to Ipoh at an average speed of 90 km/h. The average speed for the way back from Ipoh to Padang Besar is 105 km/h. The time it takes is decrease by 30 minutes. Calculate the value of x .

A 315

B 310

C 300

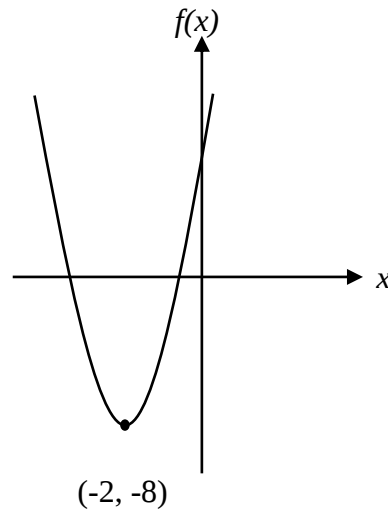
D 290

13 Rajah 5 menunjukkan lakaran bagi suatu graf fungsi kuadratik.

Diberi titik minimum bagi graf tersebut ialah $(-2, -8)$.

Diagram 5 shows a sketch of the graph of a quadratic function.

Given that the minimum point of the graph of the function is $(-2, -8)$.



Rajah 5
Diagram 5

Tentukan fungsi kuadratik yang mewakili graf tersebut.

Determine the quadratic function represented by the graph.

A $f(x) = x^2 - 8x + 4$

B $f(x) = x^2 + 8x + 4$

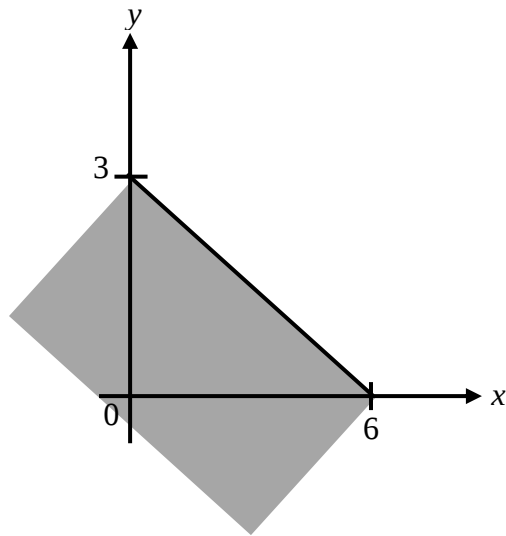
C $f(x) = x^2 - 8x + 12$

D $f(x) = x^2 + 8x + 12$

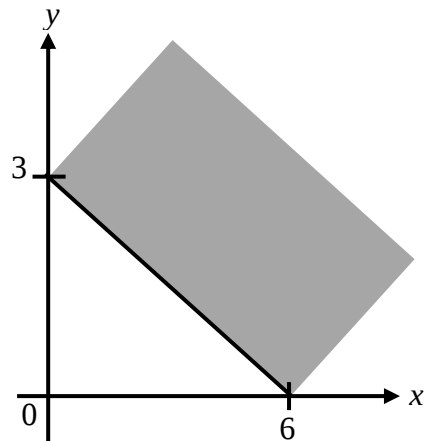
14 Antara berikut yang manakah memuaskan ketaksamaan linear $2y \leq -x + 6$?

Which of the following region satisfies the linear inequalities $2y \leq -x + 6$?

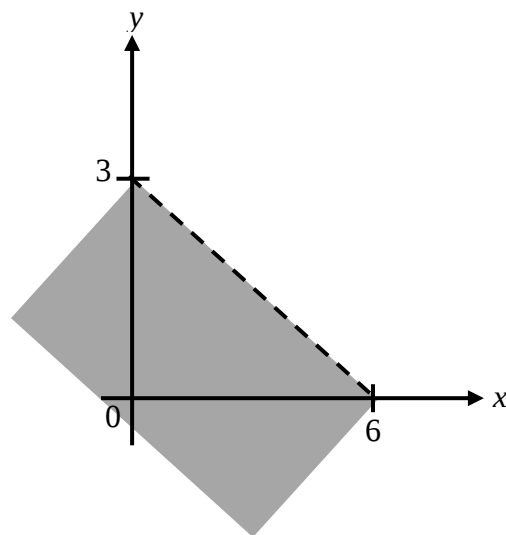
A



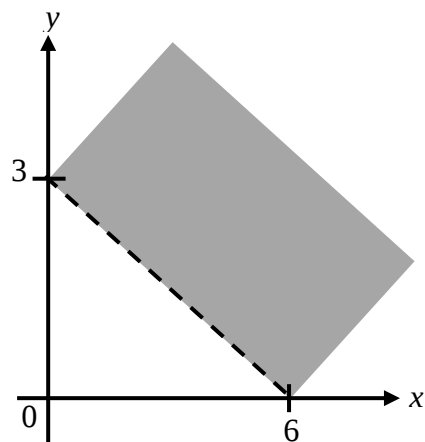
C



B

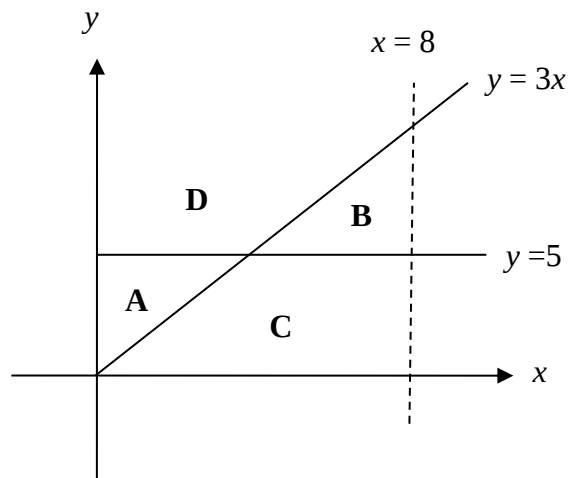


D



- 15 Rajah 6 menunjukkan suatu satah Cartes yang berlabel A, B, C dan D.

Diagram 6 shows a Cartesian plane labelled A, B, C and D.



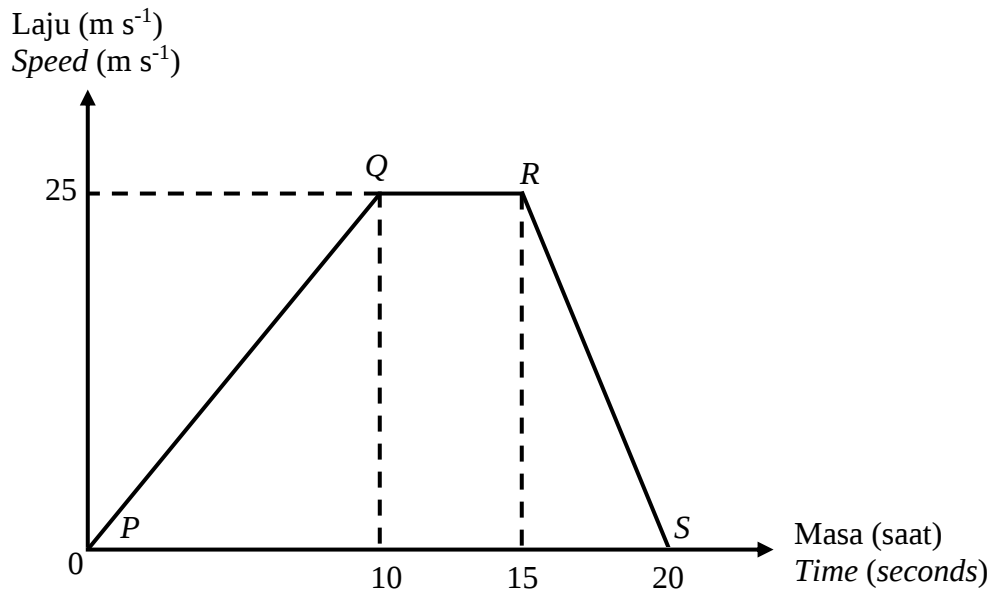
Rajah 6
Diagram 6

Kenalpasti kawasan yang manakah memuaskan ketaksamaan bagi $y \leq 3x$, $y \geq 5$ dan $x < 8$?

Identify the region that satisfy the inequalities of $y \leq 3x$, $y \geq 5$ and $x < 8$?

- 16 Rajah 7 menunjukkan graf laju-masa bagi gerakan sebuah kereta.

Diagram 7 shows the speed-time graph for the motion of a car.



Rajah 7
Diagram 7

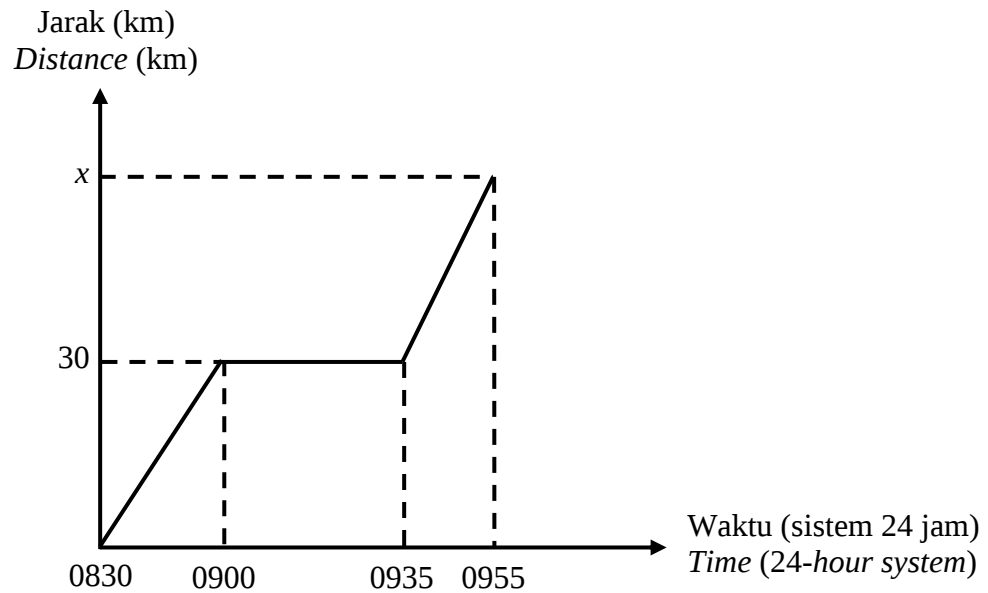
Antara pernyataan berikut, yang manakah benar tentang gerakan kereta itu?

Which of the following statements is true about the motion of the car?

- A** Kereta mengalami pecutan dengan kadar 0.4 m s^{-2} dalam tempoh 10 saat pertama.
The car accelerates at a rate 0.4 m s^{-2} for the first 10 seconds.
- B** Kereta bergerak dengan laju seragam 25 m s^{-1} dari saat ke-10 hingga saat ke-20.
The car moves at a uniform speed of 25 m s^{-1} from 10th seconds till 20th seconds.
- C** Kadar perubahan laju terhadap masa bagi 5 saat terakhir ialah -5 m s^{-1} .
The rate of change of speed for the last 5 seconds is -5 m s^{-1} .
- D** Jumlah jarak yang dilalui oleh kereta bagi 10 saat terakhir ialah 125 m.
Distance travelled by the car for the last 10 seconds is 125 m.

17 Rajah 8 menunjukkan graf jarak-masa bagi gerakan sebuah motosikal.

Diagram 8 shows the distance-time graph for the motion of a motorcycle.



Rajah 8
Diagram 8

Diberi laju motosikal itu bagi 20 minit terakhir ialah 60 km j^{-1} , cari nilai x .

Given the speed of the motorcycle for the last 20 minutes is 60 km j^{-1} , find the value of x .

A 50

B 40

C 30

D 20

18

Antara pernyataan berikut, yang manakah menghuraikan persamaan $\frac{7}{y} = 14\sqrt[3]{x}$?

Which of the following statement, describe the equation $\frac{7}{y} = 14\sqrt[3]{x}$?

A y berubah secara langsung dengan $\sqrt[3]{x}$.

y varies directly to $\sqrt[3]{x}$.

B y berubah secara songsang dengan $\sqrt[3]{x}$.

y varies inversely to $\sqrt[3]{x}$.

C y berubah secara langsung dengan x^3 .

y varies directly to x^3 .

D y berubah secara songsang dengan x^3 .

y varies inversely to x^3 .

- 19 Encik Foo menempah dewan untuk meraikan hari jadi anaknya. Masa yang digunakan t , dalam jam, untuk menyusun kerusi berubah secara langsung dengan bilangan kerusi, x , dan secara songsang dengan bilangan pekerja, y . Dia mengupah 3 orang pekerja dalam masa 2 jam untuk menyusun 150 kerusi.

Hitung bilangan pekerja yang diperlukan untuk menyusun 150 kerusi dalam masa 1 jam.

Encik Foo booked a hall to celebrate his son's birthday. The time spent t , in hour to arrange the chair varies directly as the number of seats, x , and inversely as the number of employees, y . He hired 3 employees for 2 hours to arrange 150 seats.

Calculate the numbers of employees needed to arrange 150 seats in 1 hour.

A 6

B 5

C 4

D 3

- 20 Diberi matriks $B = \begin{bmatrix} 1 & -16 \\ 20 & 4 \end{bmatrix}$, hitung nilai $b_{12} + b_{21}$.

Given matrix $B = \begin{bmatrix} 1 & -16 \\ 20 & 4 \end{bmatrix}$, calculate the value of $b_{12} + b_{21}$.

A 36

B 20

C -36

D -16

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21 $\begin{pmatrix} 3 & 2 \\ 6 & 4 \end{pmatrix} + \begin{pmatrix} 5 & 7 \\ 4 & 1 \end{pmatrix} - \begin{pmatrix} -1 & 3 \\ 8 & 1 \end{pmatrix} =$

A $\begin{pmatrix} 7 & 6 \\ 2 & 2 \end{pmatrix}$

B $\begin{pmatrix} 9 & 6 \\ 2 & 6 \end{pmatrix}$

C $\begin{pmatrix} 9 & 6 \\ 2 & 4 \end{pmatrix}$

D $\begin{pmatrix} 7 & 9 \\ 2 & 6 \end{pmatrix}$

22 $56_7 + 134_7 =$

A 115_7

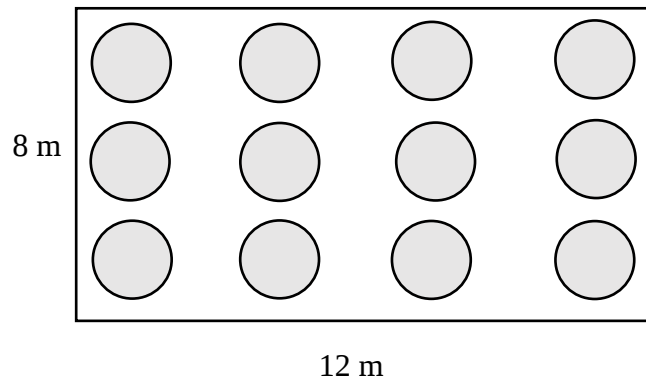
B 190_7

C 223_7

D 361_7

- 23 Rajah 9 menunjukkan sebuah dewan makan yang berukuran 12 m panjang dan 8 m lebar yang dihamparkan dengan dua belas bidang permaidani berbentuk bulatan. Diameter satu permaidani itu berukuran 1.4 m.

Diagram 9 shows a dining hall measuring 12 m long and 8 m wide. It is laid with twelve circular carpets. The diameter of each carpet 1.4 m.



Rajah 9
Diagram 9

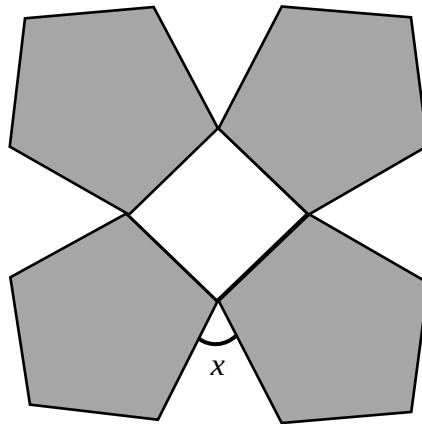
Dengan menggunakan $\pi = \frac{22}{7}$, hitung luas, dalam m^2 , kawasan lantai dewan yang tidak dilitupi permaidani.

By using $\pi = \frac{22}{7}$, calculate the area, in m^2 , that is not covered by carpet.

- A 22.08
- B 59.04
- C 77.52
- D 94.96

- 24 Rajah 10 menunjukkan logo sebuah hotel yang merupakan gabungan bentuk sebuah segiempat sama dan empat buah pentagon sekata.

Diagram 10 shows a logo of a hotel which is a combination of a square and four regular pentagons.



Rajah 10
Diagram 10

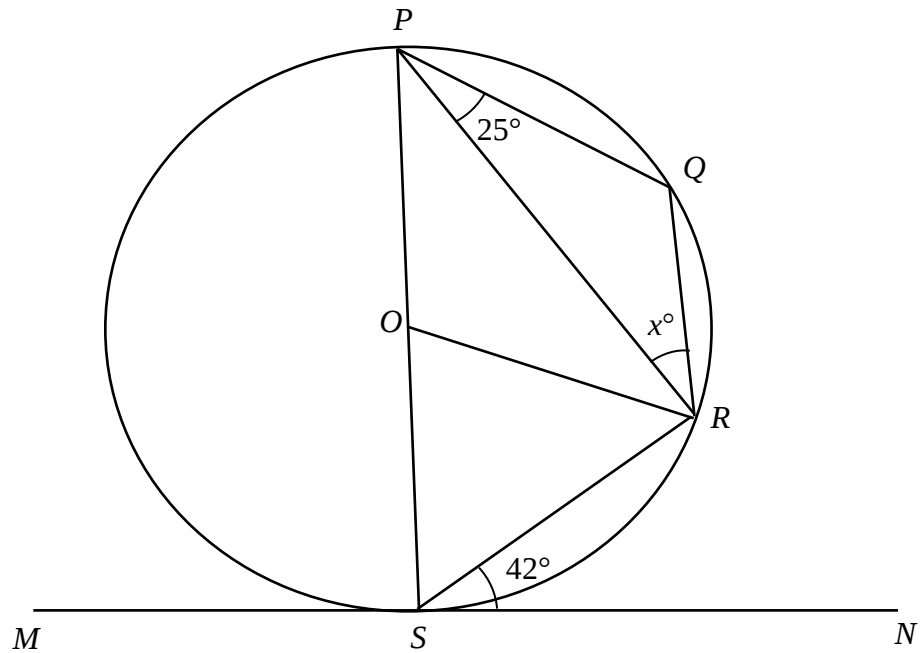
Cari nilai x .

Find the value of x .

- A 54
- B 45
- C 36
- D 30

- 25 Dalam Rajah 11, MSN adalah tangen kepada bulatan $PQRS$ di titik S dengan pusat O . POS ialah diameter kepada bulatan tersebut.

In Diagram 11, MSN is a tangent to the circle $PQRS$ at point S with centre O . POS is a diameter of the circle.



Rajah 11
Diagram 11

Cari nilai x .

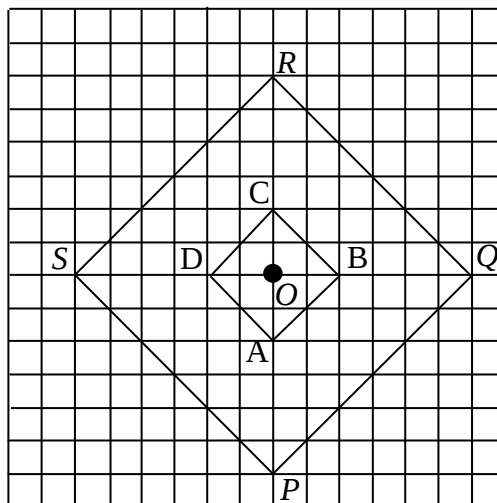
Find the value of x .

- A 23
- B 25
- C 59
- D 71

- 26 Rajah 12 menunjukkan dua segi empat sama $ABCD$ dan $PQRS$ dilukis pada grid segi empat sama. $PQRS$ ialah imej bagi $ABCD$ di bawah pembesaran dengan pusat O .

Diagram 12 shows two squares, $ABCD$ and $PQRS$ drawn on square grids.

$PQRS$ is the image of $ABCD$ under an enlargement with the centre O .



Rajah 12
Diagram 12

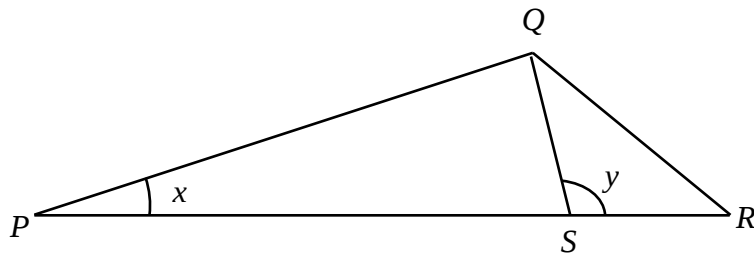
Cari faktor skala bagi pembesaran itu.

Find the scale factor of the enlargement.

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

- 27 Rajah 13 menunjukkan dua segi tiga PQS dan QRS . PSR ialah garis lurus.

Diagram 13 shows two triangles PQS and QRS . PSR is a straight line.



Rajah 13
Diagram 13

Diberi $\angle PQS = 90^\circ$, $SR = 8$ cm, $PQ = 16$ cm dan $5SR = 2PS$. Cari $\cos x^\circ + \tan y^\circ$.

Given $\angle PQS = 90^\circ$, $SR = 8$ cm, $PQ = 16$ cm and $5SR = 2PS$. Find $\cos x^\circ + \tan y^\circ$.

A $-\frac{32}{15}$

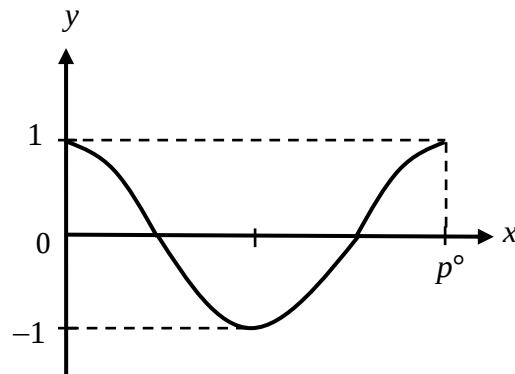
B $-\frac{8}{15}$

C $\frac{8}{15}$

D $\frac{32}{15}$

28 Rajah 14 menunjukkan graf $y = \cos 2x^\circ$.

Diagram 14 shows the graph of $y = \cos 2x^\circ$.



Rajah 14
Diagram 14

Cari nilai p .

Find the value of p .

- A 90
- B 180
- C 270
- D 360

29 Antara pernyataan majmuk berikut, yang manakah benar?

Which of the following compound statements is true?

- A** 2 dan 21 ialah nombor perdana.
2 and 21 are prime numbers.
- B** Pentagon mempunyai 5 sisi dan heptagon mempunyai 8 sisi.
Pentagon has 5 sides and heptagon has 8 sides.
- C** 81 ialah nombor perdana atau kuasa dua sempurna.
81 is prime number or perfect square.
- D** $\{r, s\}$ mempunyai 3 subset atau 3 unsur.
 $\{r, s\}$ have 3 subsets or 3 elements.

30 Tentukan kontrapositif bagi implikasi yang diberikan:

Determine the contrapositive for the given implication:

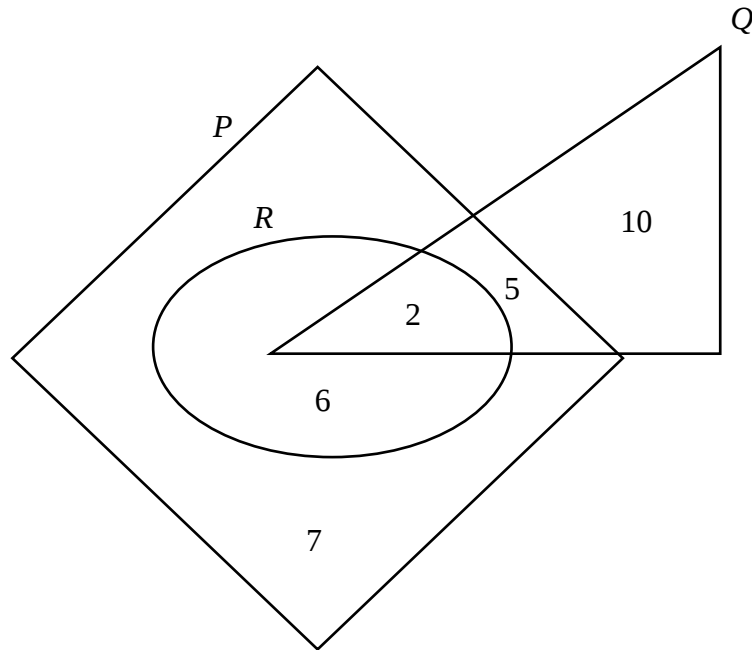
Jika $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ maka $A \cap B \neq \{ \}$

If $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ then $A \cap B \neq \{ \}$

- A** Jika $A \cap B \neq \{ \}$ maka $n(A \cup B) = n(A) + n(B) - n(A \cap B)$
If $A \cap B \neq \{ \}$ then $n(A \cup B) = n(A) + n(B) - n(A \cap B)$
- B** Jika $A \cap B \neq \{ \}$ maka $n(A \cup B) \neq n(A) + n(B) - n(A \cap B)$
If $A \cap B \neq \{ \}$ then $n(A \cup B) \neq n(A) + n(B) - n(A \cap B)$
- C** Jika $A \cap B = \{ \}$ maka $n(A \cup B) \neq n(A) + n(B) - n(A \cap B)$
If $A \cap B = \{ \}$ then $n(A \cup B) \neq n(A) + n(B) - n(A \cap B)$
- D** Jika $n(A \cup B) \neq n(A) + n(B) - n(A \cap B)$ maka $A \cap B = \{ \}$
If $n(A \cup B) \neq n(A) + n(B) - n(A \cap B)$ then $A \cap B = \{ \}$

- 31 Rajah 15 ialah gambar rajah Venn yang menunjukkan bilangan unsur dalam set P , set Q dan set R dengan keadaan set semester, $\xi = P \cup Q \cup R$.

Diagram 15 is a Venn diagram that shows the number of elements in set P , set Q and set R such that the universal set, $\xi = P \cup Q \cup R$.



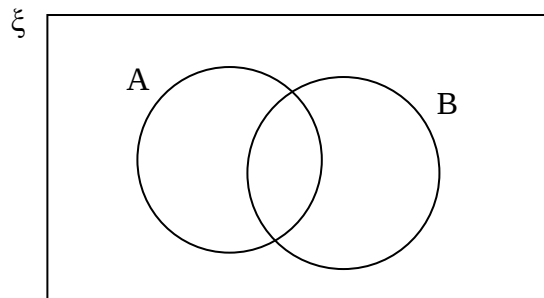
Rajah 15
Diagram 15

Tentukan bilangan unsur bagi set $(Q \cap R) \cup P'$.

Determine the number of elements for set $(Q \cap R) \cup P'$.

- A 7
- B 10
- C 12
- D 17

- 32 Gambar rajah Venn di bawah menunjukkan set semesta $\xi = \{\text{Murid – murid tingkatan lima}\}$, set $A = \{\text{Murid yang suka makan laksa}\}$ dan set $B = \{\text{Murid yang suka makan bihun sup}\}$.
Venn diagram below shows the universal set, $\xi = \{\text{Form five students}\}$, Set $A = \{\text{Student who like to eat laksa}\}$ and set $B = \{\text{Student who like to eat bihun sup}\}$.



Rajah 16
Diagram 16

Diberi $n(\xi) = 100$, $n(A) = 60$, $n(B) = 45$ dan $n(A \cap B) = 15$.

Cari bilangan murid yang tidak suka makan kedua – dua makanan tersebut.

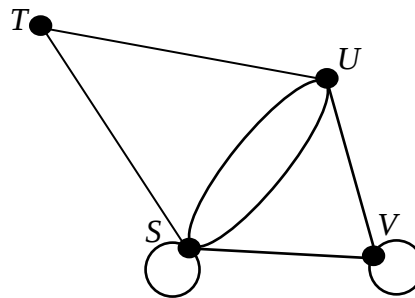
Given $n(\xi) = 100$, $n(A) = 60$, $n(B) = 45$ and $n(A \cap B) = 15$.

Find the number of students who are dislike in both of the food.

- A 10
- B 15
- C 85
- D 90

33 Rajah 17 menunjukkan satu graf yang mempunyai gelung dan berbilang tepi.

Diagram 17 shows a graph that has loops and multiple edges.



Rajah 17
Diagram 17

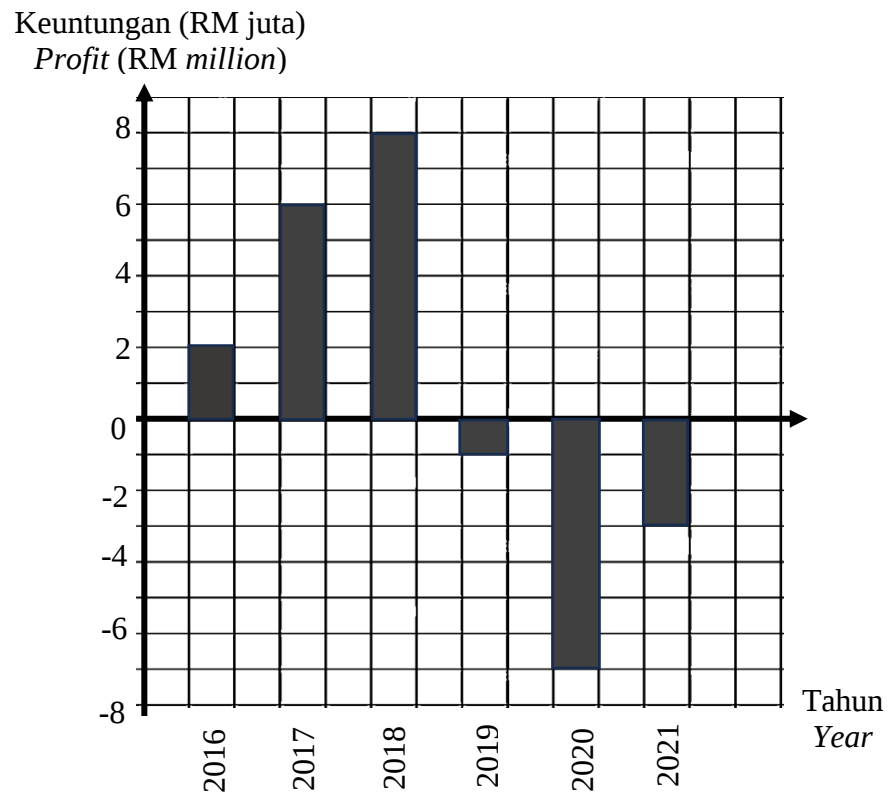
Tentukan bilangan tepi dan darjah bagi graf di atas.

Determine the number of edge and degree for the graph above.

	Tepi Edges	Darjah Degrees
A	7	14
B	8	16
C	9	18
D	10	20

- 34** Rajah 18 menunjukkan carta palang yang mewakili keuntungan Syarikat Fawwaz Maju dari tahun 2016 hingga tahun 2021.

Diagram 18 shows a bar chart which represents the profit of Syarikat Fawwaz Maju from 2016 to 2021.



Rajah 18
Diagram 18

Hitung jumlah keuntungan sepanjang 6 tahun itu.

Calculate the total profit for the 6 years.

- A** RM16 juta
RM16 millions
- B** RM8 juta
RM8 millions
- C** RM5 juta
RM5 millions
- D** RM0.83 juta
RM0.83 millions

- 35 Rajah 19 menunjukkan satu set data.
Diagram 19 shows a set of data.

12	10	11	13	15	11	10	11	13	12	14	13	13	12	15
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Rajah 19
Diagram 19

Cari median bagi data tersebut.
Find the median for the data.

- A** 10
- B** 11
- C** 12
- D** 13

36 Permudahkan.

Simplify.

$$(3a^{-1}b)^2 \times \frac{ac^4}{c^3}$$

A $\frac{3b^2c}{a}$

B $\frac{3ab^2}{c}$

C $\frac{3ab^2}{c^7}$

D $\frac{3b^2c^7}{a}$

37 Sebuah beg mengandungi 18 keping kad berwarna hijau dan kuning. Bilangan kad hijau adalah dua kali ganda bilangan kad kuning. Dua keping kad dipilih secara rawak daripada beg tanpa penggantian.

Hitung kebarangkalian mendapat kad yang sama warna.

A bag contains 18 green and yellow cards. The number of green cards is twice of yellow cards. Two cards are selected at random from the bag without replacement.

Calculate the probability both cards with the same colour are chosen.

A $\frac{9}{17}$

B $\frac{1}{2}$

C $\frac{5}{9}$

D $\frac{7}{9}$

- 38** Dalam satu tinjauan terhadap 30 orang murid Lima Bitara menunjukkan bahawa 17 orang murid minat Matematik, 8 orang murid minat Matematik dan Sains, dan 15 orang murid minat Sains. Jika seorang murid dipilih secara rawak, cari kebarangkalian bahawa murid itu suka Matematik atau Sains.

In a survey of 30 pupils of Five Bitara shows that 17 pupils like Mathematics, 8 pupils like Mathematics and Science, and 15 pupils like to Science. If a pupil chosen at random, find the probability that the pupil likes Mathematics or Sains.

A $\frac{4}{5}$

B $\frac{8}{15}$

C $\frac{11}{15}$

D $\frac{17}{60}$

- 39 Jadual 4 menunjukkan maklumat bagi nilai $\sum x$ dan $\sum x^2$ bagi suatu set data.

Table 4 shows an information for the values of $\sum x$ and $\sum x^2$ for a set of data.

N	$\sum x$	$\sum x^2$
6	45	373

Jadual 4
Table 4

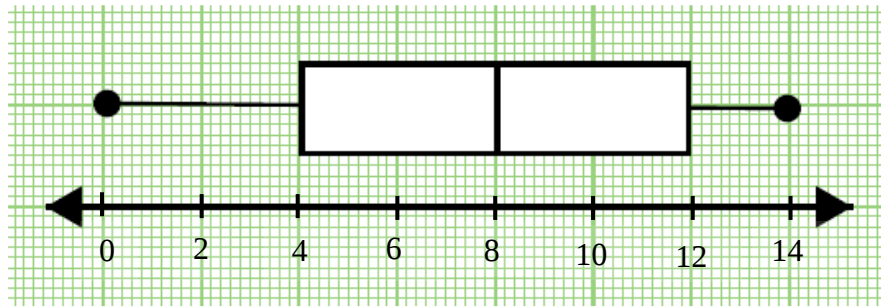
Hitung varians.

Calculate the variance.

- A 2.43
- B 5.92
- C 7.26
- D 7.39

- 40** Rajah 20 menunjukkan data bagi kaji selidik bilangan pokok dalam bentuk plot kotak.

Diagram 20 shows the data for a survey of the number of trees in the form of box plot.



Rajah 20
Diagram 20

Cari nilai julat antara kuartil bagi data di atas.

Find the interquartile range for the above data.

- A** 4
- B** 8
- C** 12
- D** 14

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER

**MAKLUMAT UNTUK CALON
INFORMATION FOR CANDIDATES**

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