

SULIT

NAMA

KELAS



**SEKOLAH MENENGAH KEBANGSAAN NAMA SEKOLAH
PULAU PINANG**

PEPERIKSAAN PERCUBAAN SPM TAHUN 2024

1449/1

MATEMATIK TINGKATAN 5

Kertas 1

September

$1\frac{1}{2}$ jam

Satu jam tiga puluh 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 2 kertas soalan ini.*

Disediakan oleh :

Disemak oleh :

Disahkan oleh :

.....
(Nama Guru Mata Pelajaran)
Guru Matematik

.....
(Nama Ketua Panitia)
Ketua Panitia Matematik

.....
(Nama GK/Ketua Bidang)
Guru Kanan Sains &
Matematik

Kertas ini mengandungi 18 halaman bercetak.

{Lihat halaman sebelah



RUMUS MATEMATIK
MATHEMATICAL FORMULAE

Rumus - rumus berikut boleh membantu anda meniajawab soalan. Simbol - simbol yang diberi adalah yang biasa digunakan.

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

NOMBOR DAN OPERASI
NUMBERS AND OPERATIONS

- | | |
|--|--|
| <p>1 $a^m \times a^n = a^{m+n}$</p> <p>3 $(a^m)^n = a^{mn}$</p> <p>5 Faedah mudah / <i>Simple interest</i>, $I = prt$</p> <p>6 Faedah kompaun / <i>Compound interest</i>, $MV = P\left(1 + \frac{r}{n}\right)^{nt}$</p> <p>7 Jumlah bayaran balik / <i>Total repayment</i>, $A = P + Prt$</p> | <p>2 $a^m \div a^n = a^{m-n}$</p> <p>4 $a^{m/n} = (a^m)^{1/n}$</p> |
|--|--|

PERKAITAN DAN ALGEBRA
RELATIONSHIP AND ALGEBRA

- 1 Jarak / *Distance* = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- 2 Titik tengah / *Midpoint*, $(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
- 3 Laju purata = $\frac{\text{Jumlah jarak}}{\text{Jumlah masa}}$
Average speed = $\frac{\text{Total distance}}{\text{Total time}}$
- 4 $m = \frac{y_2 - y_1}{x_2 - x_1}$
- 5 $m = -\frac{\text{pintasan-}y}{\text{pintasan-}x}$
 $m = -\frac{y\text{-intercept}}{x\text{-intercept}}$
- 6 $A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$

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 darab dua sisi selari $\times$ tinggi
Area of trapezium = $\frac{1}{2} \times$ sum of two parallel sides $\times$ height
- 9 Luas permukaan silinder = $2\pi j^2 + 2\pi jt$
Surface area of cylinder = $2\pi r^2 + 2\pi r t$
- 10 Luas permukaan kon = $\pi j^2 + \pi jt$
Surface area of cone = $\pi r^2 + \pi r r$
- 11 Luas permukaan sfera = $4\pi j^2$
Surface area of sphere = $4\pi r^2$
- 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 = $\pi r^2 h$

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SULIT

- 14 Isi padu kon = $\frac{1}{3}\pi r^2 h$
Volume of cone = $\frac{1}{3}\pi r^2 h$
- 15 Isi padu sfera = $\frac{4}{3}\pi r^3$
Volume of sphere = $\frac{4}{3}\pi r^3$
- 16 Isi padu piramid = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
Area 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, $\bar{x} = \frac{\sum fx}{\sum f}$
- 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 $P(A) = \frac{n(A)}{n(S)}$

Jawab **semua** soalan.

Answer **all** questions.

1. Diberi $a^m \times a^n = b^m \times b^n$. Antara yang berikut, yang manakah benar?

Given $a^m \times a^n = b^m \times b^n$. Which of the following is true?

A $a \neq b$

B $a = b$

C $a = m$

D $a = n$

2. Rajah 1 menunjukkan suatu jujukan nombor.

Diagram 1 shows a number sequence.



Rajah 1
Diagram 1

Nyatakan pola bagi jujukan itu.

State the pattern of the sequence.

A Menambah $\frac{3}{8}$

B Menambah $\frac{1}{2}$

Add $\frac{3}{8}$

Add $\frac{1}{2}$

C Mendarab $\frac{1}{2}$

D Mendarab $\frac{3}{2}$

Multiply $\frac{1}{2}$

Multiply $\frac{3}{2}$

3. Gandaan sepunya terkecil boleh dikenal pasti melalui kaedah yang berikut **kecuali**

Lowest common multiple can be determined by using the following method **except**

A menyenaraikan gandaan sepunya
listing the common multiples

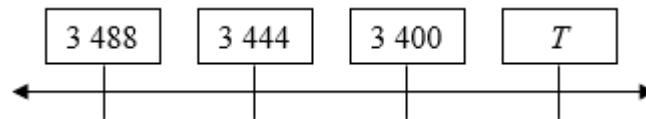
B pembahagian berulang
repeated division

C pemfaktoran
factorisation

D pemfaktoran perdana
prime factorisation

4. Rajah 2 menunjukkan suatu garis nombor.

Diagram 2 shows a number line.



Rajah 2
Diagram 2

Cari nilai bagi T dalam bentuk piawai tepat kepada tiga angka bererti.

Find the value of T in standard form correct to three significant figures.

- | | | | |
|----------|--------------------|----------|--------------------|
| A | 3.35×10^3 | B | 33.5×10^2 |
| C | 3.36×10^3 | D | 33.6×10^2 |

5. Firdaus membuat penyimpanan RM 10 500 ke dalam akaun simpanan dengan kadar faedah 3.2% setahun dan dikompaunkan setiap suku tahun. Hitung jumlah simpanannya selepas tiga tahun.

Firdaus saves RM 10 500 in the savings account with an interest rate of 3.2% per annum and compounded quarterly. Calculate his total savings after 3 years.

- | | | | |
|----------|--------------|----------|--------------|
| A | RM 11 553.56 | B | RM 16 502.99 |
| C | RM 16 505.08 | D | RM 26 440.79 |

6. Antara berikut yang manakah jenis insurans am?

Which of the following are the type of general insurance?

I	Insurans Hayat / <i>Life insurance</i>
II	Insurans perjalanan / <i>Travel insurance</i>
III	Insurans kebakaran / <i>Fire insurance</i>
IV	Insurans berkelompok / <i>Group insurance</i>

Jadual 1
Table 1

- | | | | |
|----------|-------------------------------|----------|---------------------------------|
| A | I dan II
I <i>and</i> II | B | II dan III
II <i>and</i> III |
| C | II dan IV
II <i>and</i> IV | D | III dan IV
III <i>and</i> IV |

7. Tukarkan $4 \times 5^3 + 2 \times 5^1 + 3$ kepada satu nombor dalam asas lima.
Convert $4 \times 5^3 + 2 \times 5^1 + 3$ to a number in base five.

- A 423_5 B 4020_5
 C 4023_5 D 40203_5

8. Jadual 2 menunjukkan sebahagian daripada nilai-nilai bagi pemboleh ubah w , x dan y , yang memuaskan hubungan $w \propto \frac{x}{y^2}$.

Table 2 shows some values for the variables w , x , and y , which satisfy the relationship $w \propto \frac{x}{y^2}$.

w	2	9
x	6	r
y	3	-2

Jadual 2
 Table 2

Hitung nilai r .

Calculate the value of r .

- A 12 B 18
 C 27 D 36
9. Encik Wan ingin membuat kejutan kepada isterinya dengan membeli beg tangan berjenama yang berharga RM 1 500 dalam masa enam bulan. Beliau meletakkan sasaran untuk menyimpan sebanyak 10% daripada gaji bulanannya yang berjumlah RM 2 500.

Pilih komponen SMART yang bersesuaian dengan matlamat kewangan Encik Wan.

Encik Wan wants to surprise his wife by buying a designer handbag that costs RM 1 500 within six months. He set a target to save 10% of his monthly salary of RM 2 500.

Select the SMART component that matches Encik Wan's financial goals.

- A Boleh didapati
Available B Boleh dicapai
Attainable
 C Boleh diterima
Acceptable D Boleh digapai
Reachable

10. Dua matriks boleh didarab sekiranya
Two matrices can be multiplied if
- A bilangan lajur matriks pertama dan matriks kedua adalah sama.
the number of columns for the first matrix and the second matrix is equal.
- B bilangan lajur matriks pertama dan baris matriks kedua adalah sama.
the number of columns for the first matrix and rows for the second matrix is equal.
- C bilangan baris matriks pertama dan matriks kedua adalah sama.
the number of rows for the first matrix and the second matrix is equal.
- D bilangan baris matriks pertama dan lajur matriks kedua adalah sama.
the number of rows for the first matrix and columns for the second matrix is equal.
11. Suatu garis lurus mempunyai persamaan $3x + 4y + 7 = 0$. Pilih persamaan yang setara dalam bentuk pintasan.
A straight line has the equation $3x + 4y + 7 = 0$. Choose the equivalent equation in the intercept form.
- A $-\frac{3}{7}x - \frac{4}{7}x = -1$
- B $-\frac{3}{7}x + \frac{4}{7}x = -1$
- C $-\frac{3}{7}x - \frac{4}{7}x = 1$
- D $-\frac{3}{7}x + \frac{4}{7}x = 1$
12. Kerajaan negeri bertanggungjawab memungut hasil daripada sektor-sektor yang berikut **kecuali**
The state government is responsible for collecting revenue from the following sectors except
- A pertanian
agriculture
- B perlombongan
mining
- C perhutanan
Forestry
- D majlis perbandaran
city council

13. Jadual 3 menunjukkan pergerakan sebuah objek.

Table 3 shows movements of an object.

Tempoh <i>Duration</i>	Keterangan <i>Statement</i>
4 saat pertama <i>The first 4 seconds</i>	Laju malar <i>Uniform speed</i>
2 saat berikutnya <i>The next 2 seconds</i>	Laju dua kali ganda <i>Double the speed</i>

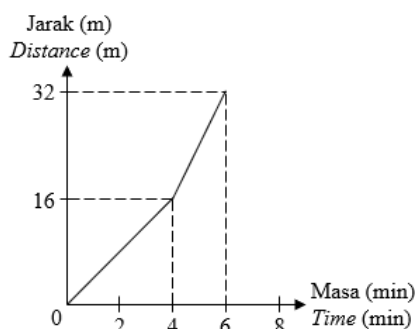
Jadual 3

Table 3

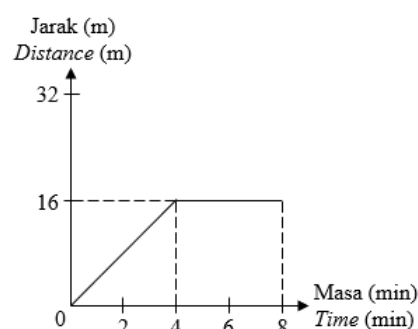
Jika jarak yang dilalui oleh objek dalam masa 4 saat pertama ialah 16 meter, graf jarak-masa yang manakah mewakili maklumat itu?

If the distance travelled by the object in the first 4 seconds is 16 meters, which distance-time graph represents the information?

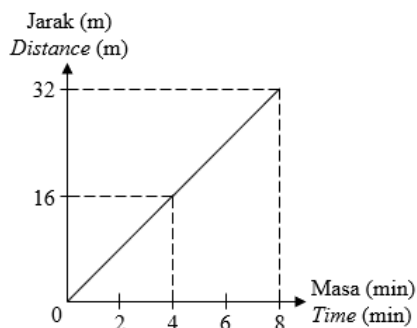
A



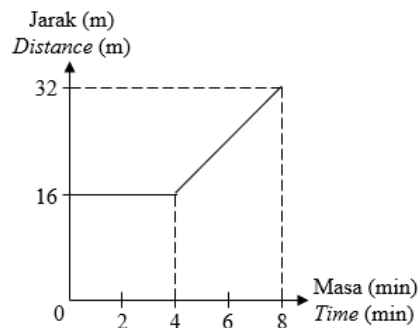
B



C



D



14. Hitung jumlah luas permukaan tangki air berbentuk kubus dengan isi padu 125 m^3 .
Calculate the total surface area of a cube-shaped water tank with a volume of 125 m^3 .

A 100 m^2
C 200 m^2

B 150 m^2
D 250 m^2

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15. Sulaiman mempunyai sekeping coklat berukuran $(k^2 - 16)$ cm panjang. Dia membahagikan coklat tersebut kepada rakan-rakannya seramai $(k - 4)$ orang. Berapakah ukuran panjang coklat yang akan diterima oleh setiap rakannya?

Sulaiman has a piece of chocolate measuring $(k^2 - 16)$ cm in length. He distributed the chocolate to his friends as many as $(k - 4)$ people. What is the length of chocolate will each friend receive?

- A $(k - 16)$ cm B $(k - 4)$ cm
C $(k - 2)$ cm D $(k + 4)$ cm

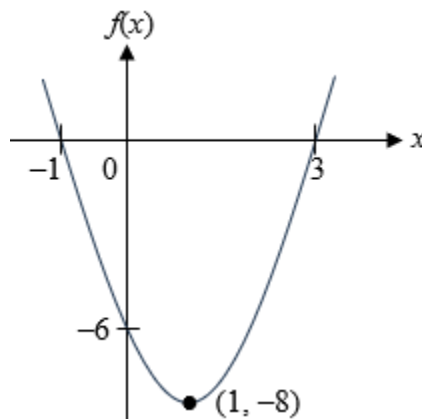
16. Panjang sebuah bilik dalam lukisan pelan rumah ialah 2 cm. Jika panjang sebenar bilik tersebut ialah 4 m, nyatakan faktor skala pelan tersebut.

The length of a room in a house plan drawing is 2 cm. If the actual length of the room is 4 m, state the scale factor of the plan.

- A $\frac{1}{50}$ B $\frac{1}{100}$
C $\frac{1}{200}$ D $\frac{1}{400}$

17. Ungkapkan fungsi kuadratik bagi lakaran graf fungsi berikut.

Express the quadratic function of the graph of the following function.



Rajah 3
Diagram 3

- A $f(x) = 2x^2 + 4x - 1$ B $f(x) = 2x^2 + 3x - 1$
C $f(x) = 2x^2 - x + 3$ D $f(x) = 2x^2 - 4x - 6$

22. Farid mempunyai satu set nombor iaitu $\{2, 4, 6, 8\}$. Dia ingin mengetahui berapakah bilangan subset yang boleh dihasilkan daripada set tersebut.

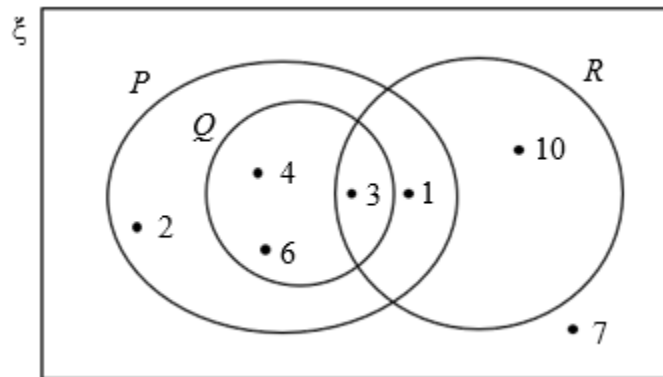
Farid has a set of numbers which are $\{2, 4, 6, 8\}$. He wants to know how many subsets can be produced from the set.

Berapakah bilangan subset bagi set nombor Farid?

How many subsets of Farid's set of numbers?

- | | | | |
|----------|----|----------|----|
| A | 4 | B | 8 |
| C | 16 | D | 24 |

23. Rajah 6 menunjukkan sebuah gambar rajah Venn dengan set P , Q dan R di dalamnya.
Diagram 6 shows a Venn diagram with sets P , Q and R in it.



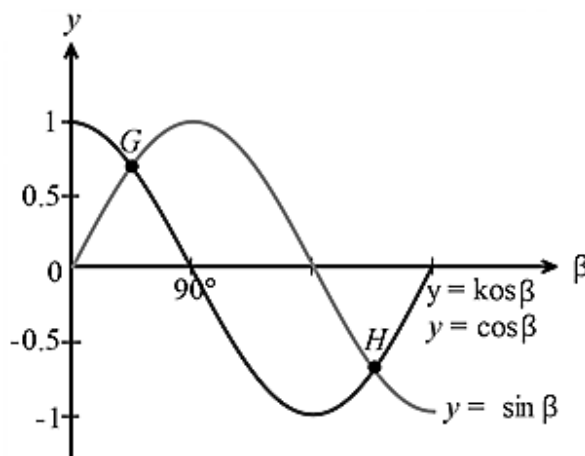
Rajah 6
Diagram 6

Antara berikut, yang manakah PALSU tentang gambar rajah Venn tersebut.

Which of the following is FALSE about the Venn diagram.

- | | | | |
|----------|---------------|----------|--------------------|
| A | $n(Q') = 5$ | B | $P' = \{7, 10\}$ |
| C | $Q \subset P$ | D | $Q \cap R = \{3\}$ |

26. Rajah 8 menunjukkan graf $y = \sin \beta$ dan $y = \cos \alpha$.
 Diagram 8 shows the graphs of $y = \sin \beta$ and $y = \cos \alpha$.



Rajah 8
 Diagram 8

Titik G dan titik H masing-masing adalah titik persilangan bagi kedua-dua graf tersebut. Nyatakan koordinat bagi titik G dan titik H .

Points G and point H are the intersection points for both graphs respectively. States the coordinates for point G and point H .

- A $G(25^\circ, 0.9063), H(205^\circ, -0.9063)$
 B $G(30^\circ, 0.8660), H(210^\circ, -0.8660)$
 C $G(45^\circ, 0.7071), H(225^\circ, -0.7071)$
 D $G(50^\circ, 0.7660), H(230^\circ, -0.7660)$
27. Sarah ingin membeli x buah buku tulis dan y buah buku lukisan. Sebuah buku tulis dan sebuah buku lukisan masing-masing berharga RM 3 dan RM 7. Dia ingin berbelanja tidak melebihi wangnya yang berjumlah RM 30 dan mempunyai baki wang selebih-lebihnya RM 4. Dia juga memerlukan sekurang-kurangnya dua buah buku lukisan. Nyatakan sistem ketaksamaan linear bagi situasi tersebut.

Sarah wants to buy x notebooks and y drawing books. The prices of a notebook and a drawing book are RM 3 and RM 7 respectively. She wants to spend of not more than her amount of money, which is RM 30 and has the balance of at most RM 4. She also needs at least two drawing books. State the system of linear inequalities for the situation.

- | | |
|--|--|
| <p>A $3x + 7y \leq 30$
 $3x + 7y \geq 4$
 $y \leq 2$</p> | <p>B $3x + 7y \leq 30$
 $3x + 7y \geq 26$
 $y \geq 2$</p> |
| <p>C $3x + 7y \leq 30$
 $3x + 7y \leq 26$
 $y \geq 2$</p> | <p>D $3x + 7y < 30$
 $3x + 7y > 26$
 $y \geq 2$</p> |

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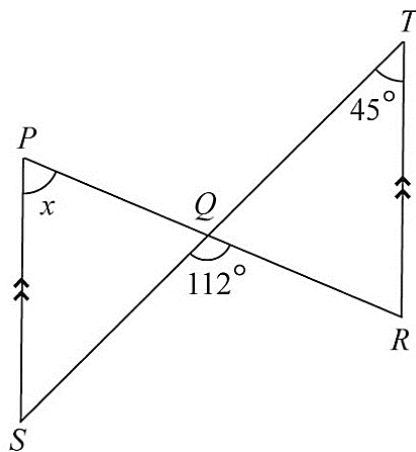
28. Jadual kekerapan di bawah menunjukkan mata yang diperolehi sekumpulan murid dalam suatu peperiksaan Matematik.

Mata <i>Point</i>	Kekerapan <i>Frequency</i>	Kekerapan longgokan <i>Cumulative frequency</i>
10 – 19	4	4
20 – 29	8	12
30 – 39	x	26
40 – 49	11	y
50 – 59	8	45

Hitung $y - x$.

- | | |
|---|---|
| <p>A 23</p> <p>C 27</p> | <p>B 25</p> <p>D 34</p> |
|---|---|

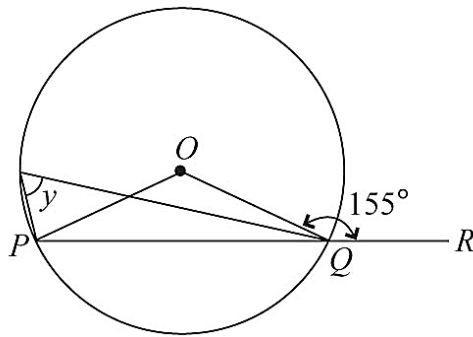
29. Rajah 9 menunjukkan dua garis lurus, PQR dan SQT .
Diagram 9 shows two straight lines, PQR and SQT .



Cari nilai x .

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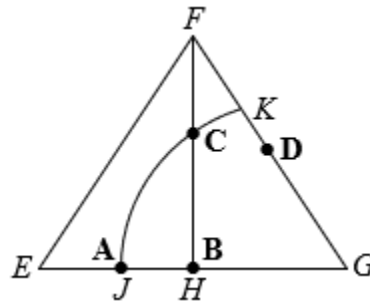
30. Rajah 10 menunjukkan sebuah bulatan berpusat O dan satu garis lurus PQR .
Diagram 10 shows a circle with centre O and a straight line PQR .



Rajah 10
 Diagram 10

Cari nilai y .
Find the value of y .

- | | | | |
|----------|------------|----------|------------|
| A | 25° | B | 45° |
| C | 55° | D | 65° |
31. Rajah 11 menunjukkan sebuah segi tiga sama yang bersisi 5 cm. JGK ialah satu lengkok bulatan berpusat di G .
Diagram 11 shows an equilateral triangle with sides 5 cm. JGK is an arc of a circle at centre G .



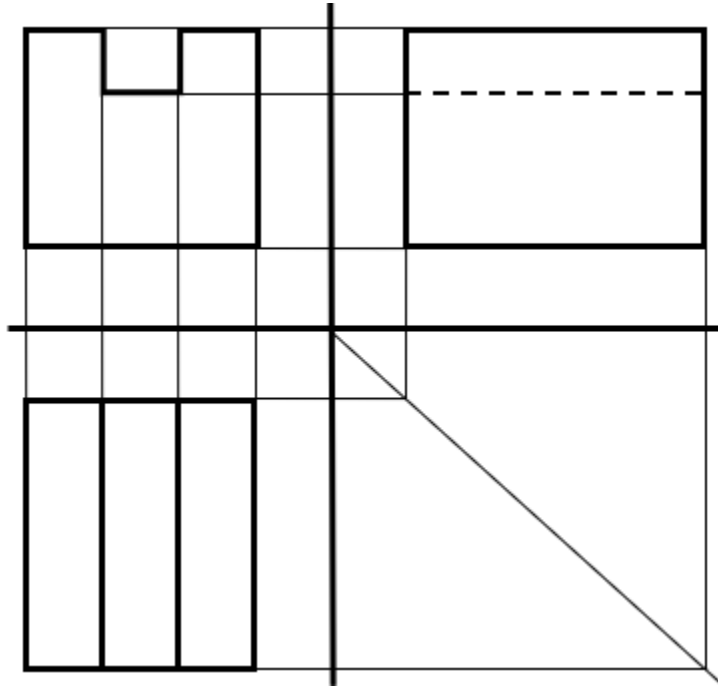
Rajah 11
 Diagram 11

Antara titik-titik, **A**, **B**, **C**, dan **D**, manakah sama jarak dari E dan G dan tidak melebihi 3 cm daripada F ?

*Which of the points, **A**, **B**, **C** and **D** is equidistant from E and G and not more than 3 cm from F ?*

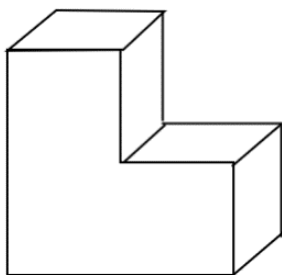
36. Rajah 13 menunjukkan pelan, dongakan depan dan dongakan sisi bagi gabungan sebuah kuboid dan prisma tegak. Yang manakah gabungan objek tersebut?

Diagram 13 below shows the plan, front elevation and side elevation of a combination of a cuboid and a right prism. Which is the combination of objects?

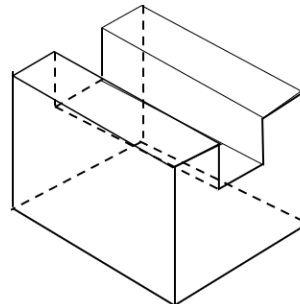


Rajah 13
Diagram 13

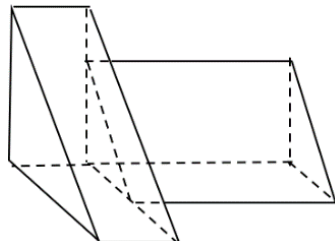
A



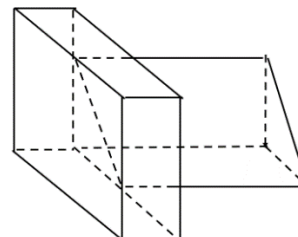
B



C



D



37. Sebuah bakul mengandung bola biru dan bola hijau. Sebiji bola dipilih secara rawak daripada bakul itu. Kebarangkalian memilih sebiji bola biru ialah $\frac{5}{17}$. Jika terdapat 60 biji bola hijau dalam bakul tersebut, berapa biji bola biru ada dalam bakul itu?
- A basket contains blue balls and green balls. A ball is randomly selected from the basket. The probability of picking a blue ball is $\frac{5}{17}$. If there are 60 green balls in the basket, how many blue balls are in the basket?*

A 85

B 65

C 45

D 25

- 38.** Diberi $Q = 7m - 9$. Antara berikut, yang manakah mengungkapkan m sebagai perkara rumus dengan betul?

Given $Q = 7m - 9$. Which of the following express m as the subject of formula correctly?

A $m = \frac{Q+9}{7}$

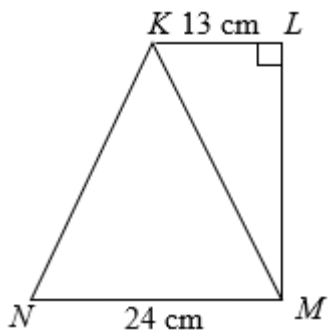
B $m = \frac{Q-9}{7}$

C $m = Q + \frac{9}{7}$

D $m = Q - \frac{9}{7}$

39. Rajah 14 menunjukkan dua buah segi tiga, KLM dan KMN . Garis lurus KL dan MN adalah selari.

Diagram 14 shows two triangles, KLM and KMN . Straight lines KL and MN are parallel.



Rajah 14
Diagram 14

Luas segi tiga KLM ialah 39 cm^2 . Hitungkan luas bagi seluruh rajah, dalam cm^2 .

The area of triangle KLM is 39 cm^2 . Calculate the area of whole diagram, in cm^2 .

A 63

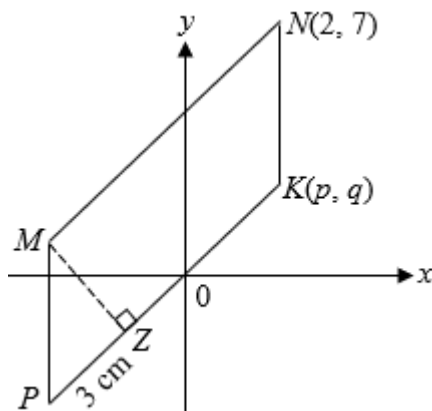
B 72

C 111

D 312

40. Rajah 15 menunjukkan sebuah segi empat selari $KNMP$. MP dan NK selari dengan paksi- y . Diberi jarak bagi MZ ialah 4 unit.

Diagram 15 above shows a parallelogram $KNMP$. MP and NK are parallel to the y -axis. Given the distance for MZ is 4 units.



Rajah 15
Diagram 15

Cari koordinat K .

Find coordinates of K .

A (0, 2)

B (2, 2)

C (2, 3)

D (3, 2)

KERTAS SOALAN TAMAT
THE END OF QUESTION PAPER

