

SENARAI RUMUS

NOMBOR DAN OPERASI
NUMBER 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

$a^{\frac{1}{2}} = \sqrt{a}$
- 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

$$\text{Premium} = \frac{\text{Nilai muka polisi}}{\text{RM } x} \times (\text{kadar premium per RM } x)$$
$$\text{Premium} = \frac{\text{face value of policy}}{\text{RM } x} \times (\text{premium rate per RM } x)$$
- 11

Jumlah insurans yang harus dibeli = $\left(\frac{\text{Peratusan}}{\text{ko} - \text{insurans}}\right) \times \left(\frac{\text{Nilai boleh}}{\text{insurans harta}}\right)$
$$\text{Amount of required insurance} = \left(\frac{\text{Percentage of}}{\text{co} - \text{insurance}}\right) \times \left(\frac{\text{Insurable value}}{\text{of property}}\right)$$

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 = $\frac{\text{Jumlah jarak}}{\text{Jumlah masa}}$
$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$
- 4

$m = \frac{y_2 - y_1}{x_2 - x_1}$
- 5

$A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$
- 6

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

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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 $= \pi d = 2\pi j$
- 4 Luas bulatan $= \pi j^2$
Area of circle $= \pi r^2$
- 5 $\frac{\text{Panjang lengkok}}{2\pi j} = \frac{\theta}{360^\circ}$
 $\frac{\text{Arc length}}{2\pi j} = \frac{\theta}{360^\circ}$
- 6 $\frac{\text{Luas sektor}}{\pi j^2} = \frac{\theta}{360^\circ}$
 $\frac{\text{Area of sector}}{\pi j^2} = \frac{\theta}{360^\circ}$
- 7 Luas layang $= \frac{1}{2} \times \text{hasil darab panjang dua pepenjuru}$
Area of kite $= \frac{1}{2} \times \text{product of the length of two diagonals}$
- 8 Luas trapezium $= \frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$
Area of trapezium $= \frac{1}{2} \times \text{sum of two parallel sides} \times \text{height}$
- 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 $= \pi r^2 + \pi rs$
- 11 Luas permukaan sfera $= 4\pi j^2$
Surface area of sphere $= 4\pi r^2$
- 12 Isi padu prisma $= \text{luas keratan rentas} \times \text{tinggi}$
Volume of prism $= \text{cross sectional area} \times \text{height}$
- 13 Isi padu silinder $= \pi j^2 t$
Volume of cylinder $= \pi r^2 h$

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- 14 Isi padu kon $= \frac{1}{3} \pi j^2 t$
Volume of cone $= \frac{1}{3} \pi r^2 h$
- 15 Isi padu sfera $= \frac{4}{3} \pi j^3$
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, $\bar{x} = \frac{\sum fx}{\sum f}$
- 3 Varians / Variance, $\sigma^2 = \frac{\sum x^2}{N} - \bar{x}^2 = \frac{\sum (x - \bar{x})^2}{N}$
- 4 Varians / Variance, $\sigma^2 = \frac{\sum fx^2}{\sum f} - \bar{x}^2 = \frac{\sum f(x - \bar{x})^2}{\sum f}$
- 5 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2} = \sqrt{\frac{\sum (x - \bar{x})^2}{N}}$
- 6 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2} = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}}$
- 7 $P(A) = \frac{n(A)}{n(S)}$
- 8 $P(A') = 1 - P(A)$

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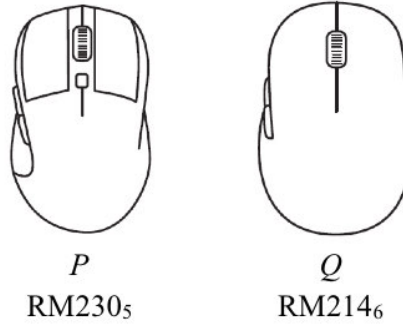
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Bahagian A

[40 markah]

Jawab semua soalan.

- 1 Rajah 1 menunjukkan harga dua tetikus, dalam asas nombor yang berbeza.
Diagram 1 shows the prices of two mouses, in different number bases.



Rajah 1 / Diagram 1

Encik Ismail ingin membeli 3 unit tetikus P dan 3 unit tetikus Q . Jika jumlah pembelian melebihi 5 unit, pelanggan akan mendapat diskaun sebanyak 5% daripada jumlah harga. Hitung jumlah harga yang perlu dibayar oleh Encik Ismail dalam asas sepuluh.

Encik Ismail wants to buy 3 units of mouse P and 3 units of mouse Q . If the total purchase exceeds 5 units, the customer will receive a 5% discount on the total price. Calculate the total price that Encik Ismail needs to pay in base ten.

[3 markah/marks]

Jawapan / Answer :

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- 2 (a) Tulis satu pernyataan majmuk yang benar dengan menggabungkan dua pernyataan berikut dengan menggunakan perkataan 'atau'.

Write a true compound statement by combining the following two statements using the word 'or'.

125 ialah gandaan 5. 125 is a multiple of 5. 125 ialah nombor kuasa dua sempurna. 125 is a perfect square number.

[1 markah/mark]

- (b) Tulis kontrapositif bagi implikasi berikut dan tentukan nilai kebenarannya.
Write the contrapositive of the following implication and determine its truth value.

Jika 6 ialah faktor bagi 30, maka 30 boleh dibahagi tepat dengan 6. <i>If 6 is a factor of 30, then 30 is divisible by 6.</i>

[2 markah/marks]

- (c) Bentukkan satu kesimpulan induktif yang kuat berdasarkan jujukan nombor 3, 8, 17, 30, ...
Form a strong inductive conclusion based on the number sequence 3, 8, 17, 30, ...

$$\begin{aligned}
 3 &= 3(1) + 2(0)^2 \\
 8 &= 3(2) + 2(1)^2 \\
 17 &= 3(3) + 2(2)^2 \\
 30 &= 3(4) + 2(3)^2 \\
 &\vdots
 \end{aligned}$$

[2 markah/marks]

Jawapan / Answer :

(a)

.....

(b) Kontrapositif / Contrapositive :

.....

Nilai kebenaran / Truth value :

.....

(c)

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- 3 Diberi bahawa set semesta, $\xi = \{x: 37 \leq x < 50, x \text{ ialah integer}\}$, set $L = \{x: x \text{ ialah gandaan } 3\}$ dan set $M = \{x: x \text{ ialah nombor dengan keadaan hasil tambah digit-digitnya adalah lebih besar daripada } 7\}$.

Given that the universal set $\xi = \{x: 37 \leq x < 50, x \text{ is an integer}\}$, set $L = \{x: x \text{ is a multiple of } 3\}$ and set $M = \{x: x \text{ is a number such that the sum of its digits is greater than } 7\}$.

- (a) Senaraikan unsur bagi set L dengan menggunakan tatatanda set.

List the elements of set L by using the set notation.

[1 markah/mark]

- (b) Seterusnya, lukis satu gambar rajah Venn untuk mewakili set semesta, ξ , set L dan set M .

Hence, draw a Venn diagram to represent the universal set, ξ , set L and set M .

[3 markah/marks]

Jawapan / Answer :

(a)

(b)

SULIT

- 4 Rajah 4 menunjukkan empat kad nombor yang disusun mengikut satu urutan.
Diagram 4 shows four numbered cards that are arranged according to a sequence.



Rajah 4 / Diagram 4

- (a) Nyatakan nilai k .
State the value of k .
- (b) Seterusnya, nyatakan sebutan ke- n bagi jujukan tersebut.
Hence, state the n^{th} term of the sequence.

[1 markah/mark]

[2 markah/marks]

Jawapan / Answer :

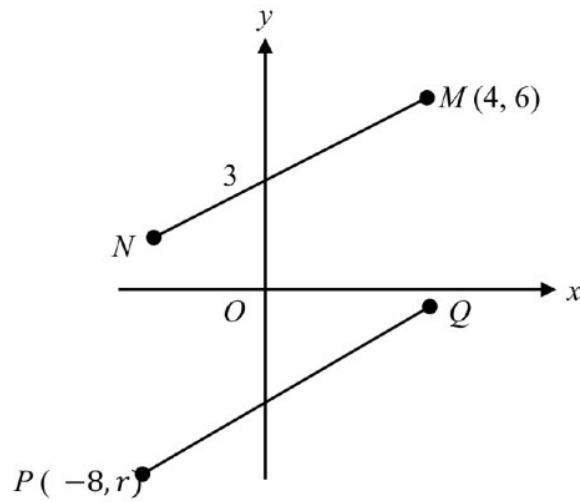
(a)

(b)

SULIT

- 5 Rajah 5 menunjukkan dua garis lurus, MN dan PQ , dilukis pada suatu satah Cartes. Garis lurus MN selari dengan garis lurus PQ .

Diagram 5 shows two straight lines, MN and PQ , drawn on a Cartesian plane. The straight line MN is parallel to the straight line PQ .



Rajah 5 / Diagram 5

- (a) Cari persamaan garis lurus MN .
Find the equation of the straight line MN .

[2 markah/marks]

- (b) Cari nilai r .
Find the value of r .

[2 markah/marks]

Jawapan / Answer :

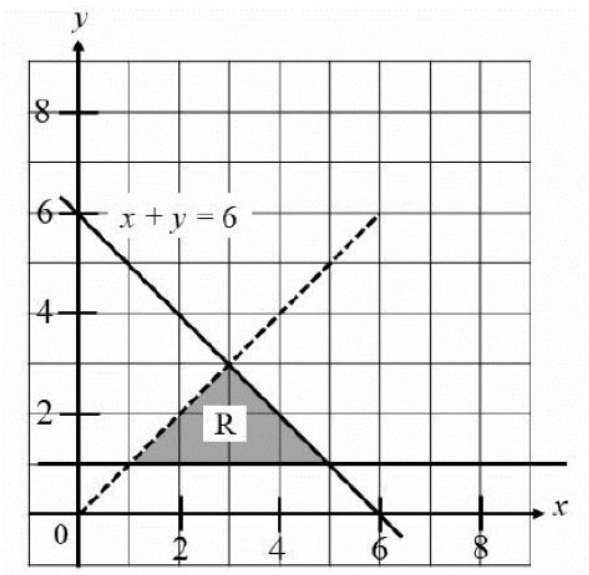
(a)

(b)

SULIT

SULIT

- 6 Rajah 6 menunjukkan tiga garis lurus yang dilukis pada suatu satah Cartes. Rantau berlorek **R** dibatasi oleh tiga garis lurus tersebut.
*Diagram 6 shows three straight lines drawn on a Cartesian plane. The shaded region **R** is bounded by the three straight lines.*



Rajah 6 / Diagram 6

- (a) Tulis tiga ketaksamaan yang mentakrifkan rantau berlorek **R**.
*Write three inequalities that define the shaded region **R**.*

[3 markah/marks]
- (b) Nyatakan satu titik yang terletak di dalam rantau **R**.
*State one point that lies within region **R**.*

[1 markah/mark]

Jawapan / Answer :

- (a)

.....

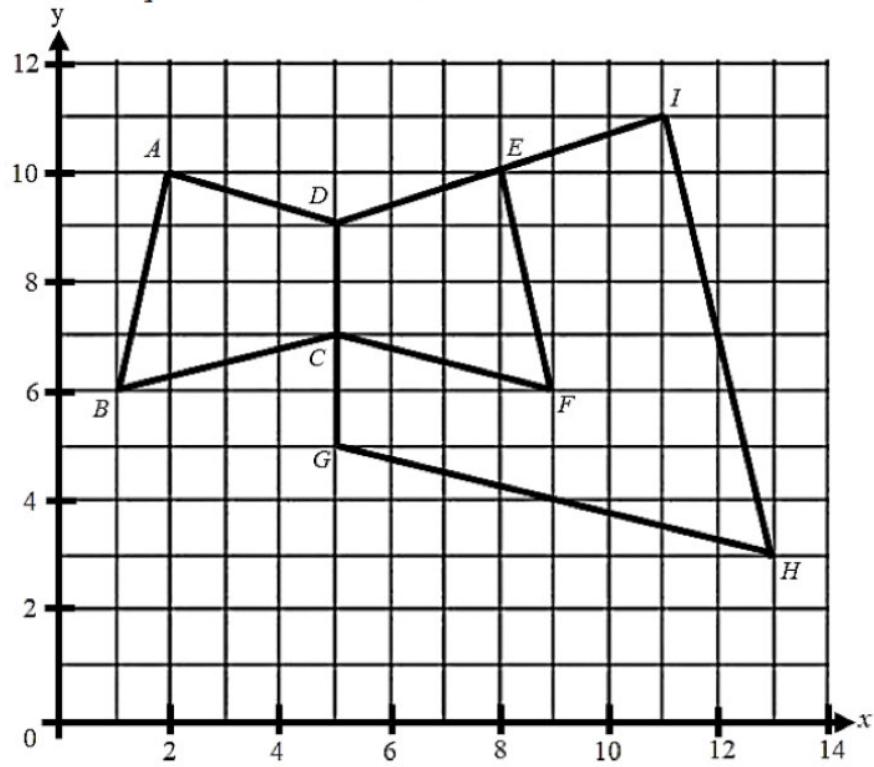
.....

.....
- (b)

SULIT

SULIT

- 7 Rajah 7 menunjukkan sisi empat, $ABCD$, $CDEF$ dan $DGHI$.
 Diagram 7 shows quadrilaterals, $ABCD$, $CDEF$ and $DGHI$.



Rajah 7 / Diagram 7

- (a) Sisi empat $DGHI$ ialah imej bagi sisi empat $ABCD$ di bawah gabungan transformasi WV . Huraikan selengkapnya transformasi W .
Quadrilateral $DGHI$ is the image of quadrilateral $ABCD$ under the combined transformation WV . Describe in full, the transformation W .
- (b) Nyatakan nisbah luas sisi empat $ABCD$ kepada luas sisi empat $DGHI$.
State the ratio of the area of quadrilateral $ABCD$ to the area of quadrilateral $DGHI$.

[4 markah/marks]

Jawapan / Answer :

- (a) W :

 (b)

SULIT

SULIT

- 8 Encik Sean mempunyai jumlah pendapatan tahunan sebanyak RM62 000 pada tahun 2025. Beliau telah menderma RM150 kepada sebuah badan kebajikan yang diluluskan oleh kerajaan. Jadual 8.1 menunjukkan pelepasan cukai yang dituntutnya. Jadual 8.2 menunjukkan sebahagian daripada kadar cukai pendapatan individu untuk Tahun Taksiran 2025.

Encik Sean had a total annual income of RM62 000 in the year 2025. He donated RM150 to a government approved charity organisation. Table 8.1 shows the tax reliefs claimed by him. Table 8.2 shows part of individual income tax rates for Assessment Year of 2025.

Pelepasan cukai <i>Tax relief</i>	Amaun (RM) <i>Amount (RM)</i>
Individu <i>Individual</i>	9 000
Gaya hidup (had RM2 500) <i>Lifestyle (limited to RM2 500)</i>	2 500
Anak yang belum berkahwin dan berumur di bawah 18 tahun <i>Each unmarried child and under the age of 18 years old</i>	4 000
Insurans hayat dan KWSP (had RM7 000) <i>Life insurance and EPF (limited to RM7 000)</i>	4 800
Insurans perubatan (had RM3 000) <i>Medical insurance (limited to RM3 000)</i>	3 200

Jadual 8.1 / Table 8.1

Banjaran pendapatan bercukai <i>Chargeable income</i> (RM)	Pengiraan <i>Calculations</i> (RM)	Kadar <i>Rate</i> (%)	Cukai <i>Tax</i> (RM)
20 001 – 35 000	20 000 pertama <i>On the first 20 000</i>	3	150
	15 000 berikutnya <i>Next 15 000</i>		450
35 001 – 50 000	35 000 pertama <i>On the first 35 000</i>	8	600
	15 000 berikutnya <i>Next 15 000</i>		1 200

Jadual 8.2 / Table 8.2

Setiap bulan, gaji beliau dipotong sebanyak RM145 untuk potongan cukai bulanan (PCB).

Each month, his salary was deducted by RM145 for monthly tax deduction (PCB).

SULIT



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- (a) Hitung pendapatan bercukai Encik Sean.
Calculate the chargeable income of Encik Sean.
[1 markah/mark]
- (b) Berdasarkan Jadual 8.2, hitung cukai pendapatan yang perlu dibayar oleh Encik Sean bagi tahun tersebut.
Based on Table 8.2, calculate the income tax to be paid by Encik Sean for that year.
[3 markah/marks]
- (c) Adakah Encik Sean perlu membuat bayaran cukai tambahan selepas potongan cukai bulanan? Terangkan jawapan anda.
Does Encik Sean need to pay any more income tax after the monthly tax deduction? Explain your answer.
[2 markah/marks]

Jawapan / Answer :

(a)

(b)

(c)

SULIT

SULIT

- 9 Regina mempunyai pendapatan bulanan sebanyak RM3 500. Jumlah perbelanjaan bulanannya ialah RM3 200. Dia menetapkan matlamat untuk membeli sebuah kamera dalam tempoh 12 bulan. Kamera yang ingin dibelinya adalah seperti dalam Rajah 9.

Regina earns a total monthly income of RM3 500. Her total monthly expenses is RM3 200. She sets a goal to buy a camera in 12 months. The camera she wants to buy is as in Diagram 9.



Rajah 9 / Diagram 9

Tentukan sama ada matlamat Regina boleh dicapai. Justifikasikan jawapan anda dengan pengiraan.

Determine whether Regina's goal is attainable. Justify your answer with calculations.

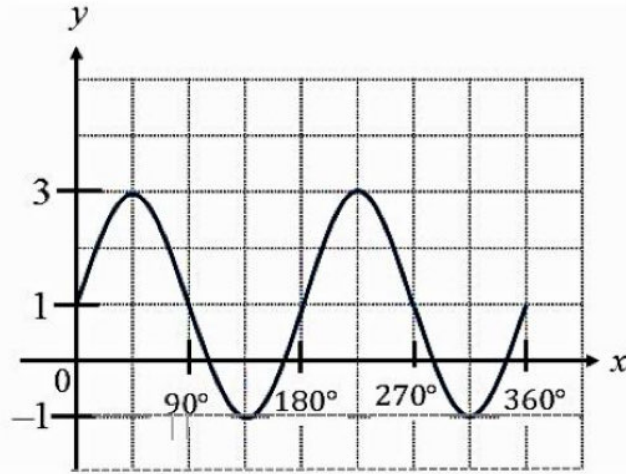
[3 markah/marks]

Jawapan / Answer :

SULIT

- 10 Rajah 10 menunjukkan graf sesaran, y cm, bagi sebuah pelampung laut terhadap sudut kitaran ombak, x .

Diagram 10 shows a graph of the displacement, y cm, of a sea buoy against the wave cycle angle, x .



Rajah 10 / Diagram 10

- Nyatakan amplitud sesaran pelampung tersebut.
State the amplitude of the buoy's displacement.
- Bentukkan satu fungsi trigonometri dalam bentuk $y = a \sin bx + c$ bagi graf tersebut.
Form a trigonometric function in the form of $y = a \sin bx + c$ for the graph.
- Tentukan kedudukan pelampung apabila $x = 120^\circ$.
Determine the position of the buoy when $x = 120^\circ$.

[4 markah/marks]

Jawapan / Answer :

(a)

(b)

(c)

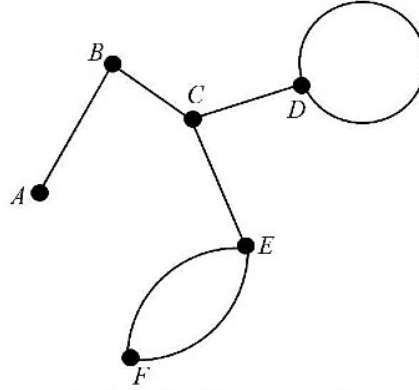
SULIT

Bahagian B

[45 markah]

Jawab semua soalan.

- 11 Rajah 11 menunjukkan sebuah graf yang mempunyai gelung dan berbilang tepi.
Diagram 11 shows a graph with a loop and multiple edges.



Rajah 11 / Diagram 11

- (a) Berdasarkan graf di Rajah 11,
Based on the graph in Diagram 11,
- (i) tentukan $n(V)$, $n(E)$ dan $\sum d(v)$,
determine $n(V)$, $n(E)$ and $\sum d(v)$,
- (ii) lukis satu pokok.
draw a tree.

[3 markah/marks]

[1 markah/mark]

Jawapan / Answer :

- (a) (i) $n(V) =$
 $n(E) =$
 $\sum d(v) =$
- (ii)

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- (b) Jadual 11 menunjukkan jarak, dalam km, bagi setiap paip air yang menghubungkan lima buah tangki air P, Q, R, S dan T.

Table 11 shows the distance, in km, for each water pipe connecting five water tanks P, Q, R, S and T.

Pasangan bagi tangki air <i>Pair of water tanks</i>	Jarak (km) <i>Distance (km)</i>
(P, Q)	5.2
(P, S)	8.0
(Q, R)	4.5
(Q, S)	6.1
(S, R)	3.8
(S, T)	5.5
(R, T)	7.2

Jadual 11 / Table 11

- (i) Berdasarkan Jadual 11, lukis satu graf terarah dan berpemberat pada ruang jawapan yang disediakan.

Based on Table 11, draw a directed and weighted graph in the answer space provided.

[3 markah/marks]

- (ii) Seorang juruteknik ingin memeriksa saluran paip dari tangki air P ke tangki air T. Nyatakan laluan jarak minimum, dengan syarat juruteknik tersebut mesti melalui semua tangki air. Seterusnya, hitung jarak minimum tersebut, dalam km.

A technician wants to inspect the pipeline from water tank P to water tank T. State the route with the minimum distance, provided that the technician must pass through all the water tank. Hence, calculate the minimum distance, in km.

[2 markah/marks]

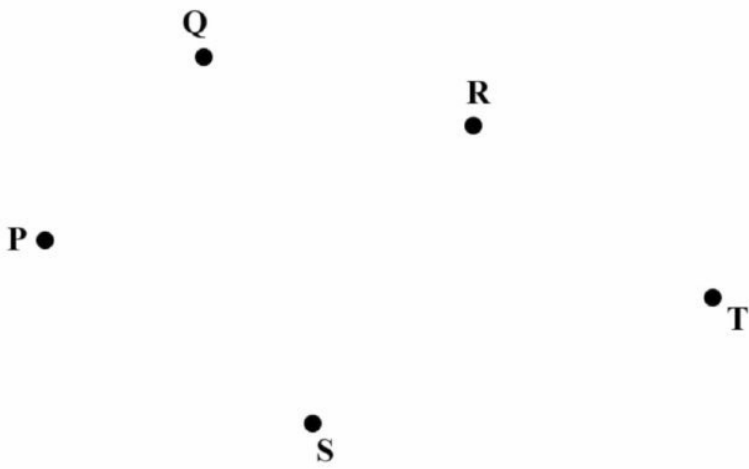
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Jawapan / *Answer* :

(b) (i)



(ii)

SULIT

SULIT

- 12 Jadual 12.1 menunjukkan taburan kekerapan bagi ketinggian, dalam cm, bagi sekumpulan 80 orang murid Tingkatan 5 di SMK Bakol.
Table 12.1 shows the frequency distribution of heights, in cm, for a group of 80 Form 5 students in SMK Bakol.

Ketinggian (cm) <i>Height (cm)</i>	Kekerapan <i>Frequency</i>
136 – 140	0
141 – 145	6
146 – 150	14
151 – 155	25
156 – 160	18
161 – 165	12
166 – 170	5

Jadual 12.1 / Table 12.1

- (a) Lengkapkan Jadual 12.2 di ruang jawapan.
Complete Table 12.2 in the answer space.
[3 markah/marks]
- (b) Untuk ceraian soalan ini, gunakan kertas graf pada halaman **21**. Anda boleh menggunakan pembaris fleksibel.
For this part of the question, use graph paper on page 21. You may use a flexible curve rule.

Dengan menggunakan skala 2 cm kepada 5 cm pada paksi mengufuk dan 2 cm kepada 10 orang murid pada paksi mencancang, lukis satu ogif bagi data tersebut.
Using a scale of 2 cm to 5 cm on the horizontal axis and 2 cm to 10 students on the vertical axis, draw an ogive for the data.
[4 markah/marks]
- (c) Berdasarkan ogif yang dilukis di 12(b),
Based on the ogive drawn in 12(b),
(i) cari median bagi taburan ketinggian tersebut,
find the median of the height distribution,
[1 markah/mark]

SULIT

SULIT

- (ii) hanya murid yang. Cari bilangan murid yang mempunyai ketinggian melebihi 158 cm untuk melayakkan mereka menyertai pasukan bola tampar sekolah.
Find the number of students with a height exceeding 158 cm so that they are eligible to join the school volleyball team.

[1 markah/mark]

Jawapan / Answer :

(a)

Ketinggian <i>Height</i> (cm)	Kekerapan <i>Frequency</i>	Sempadan atas <i>Upper boundary</i>	Kekerapan longgokan <i>Cumulative frequency</i>
136 – 140	0		
141 – 145	6		
146 – 150	14		
151 – 155	25		
156 – 160	18		
161 – 165	12		
166 – 170	5		

Jadual 12.2 / Table 12.2

- (b) Rujuk graf pada halaman 21.
Refer graph on page 21.

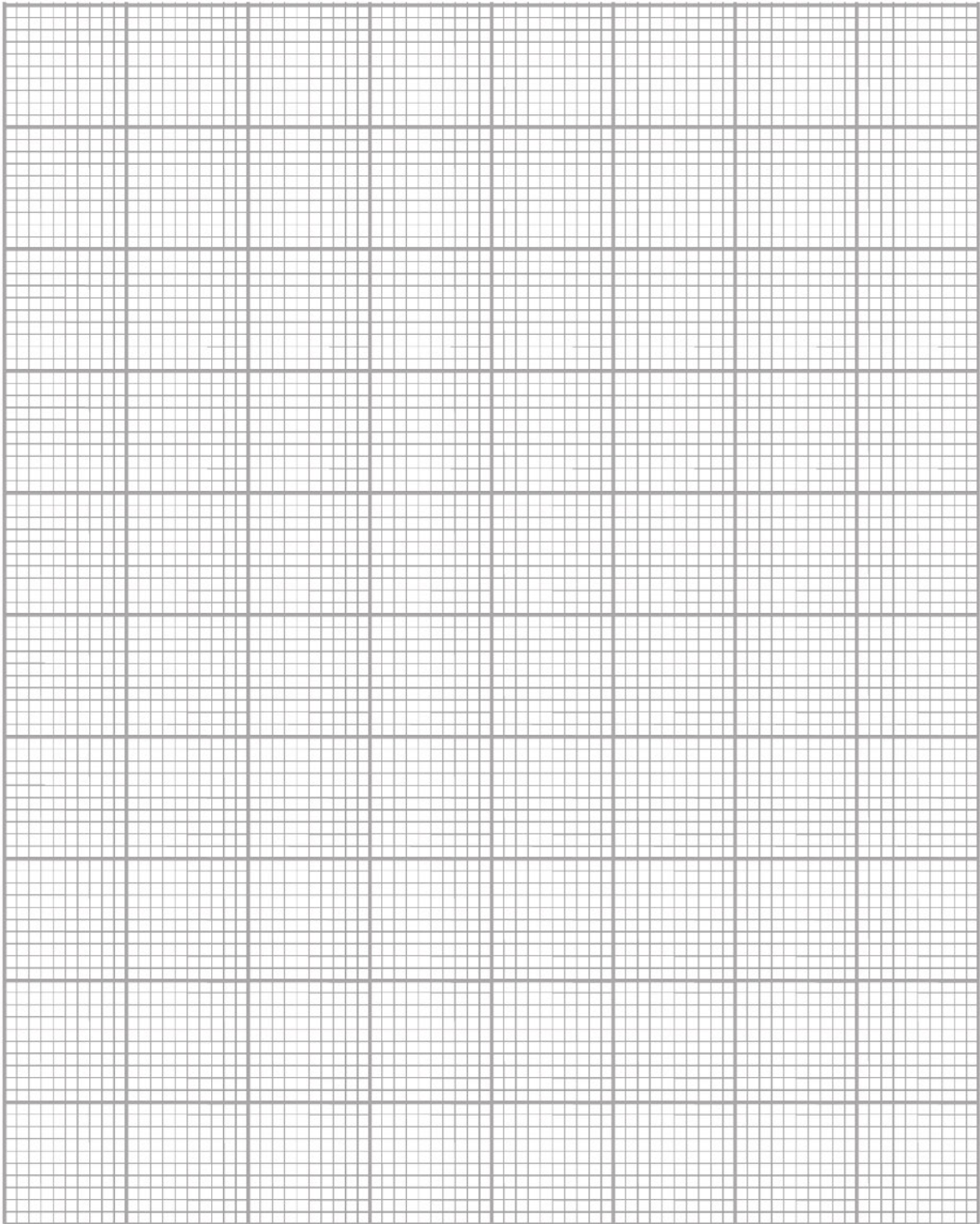
- (c) (i)

- (ii)

SULIT

SULIT

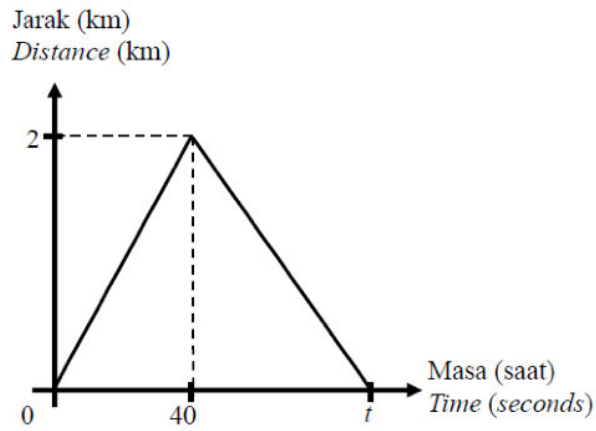
Graf untuk Soalan 12
Graph for Question 12



SULIT

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- 13 (a) Rajah 13.1 menunjukkan graf jarak-masa teksi untuk tempoh t saat. Diberi bahawa laju purata teksi ialah 50 m s^{-1} .
Diagram 13.1 shows the distance-time graph of taxi for a period of t seconds. It is given that the average speed of taxi is 50 m s^{-1} .



Rajah 13.1 / Diagram 13.1

- (i) Hitung nilai t .
Calculate the value of t .
- (ii) Hitung laju teksi, dalam m s^{-1} , dari saat ke-40 hingga saat ke- t .
Calculate the speed of taxi, in m s^{-1} , from 40th seconds to t -seconds.
- (iii) Huraikan gerakan teksi untuk 40 saat pertama.
Describe the motion of taxi for the first 40 seconds.

[5 markah/marks]

Jawapan / Answer :

(a) (i)

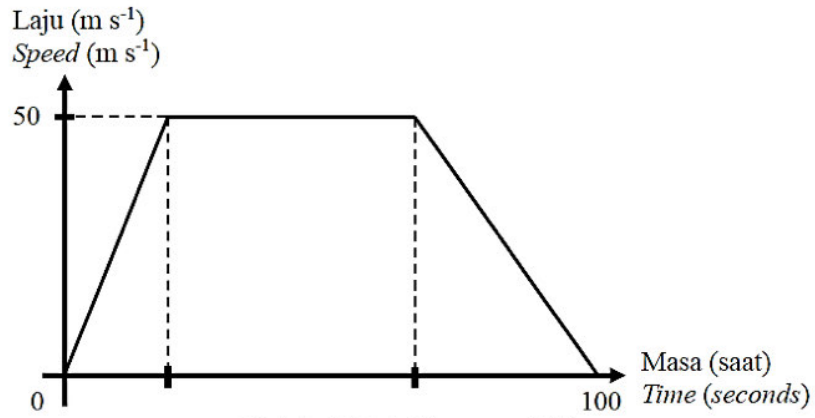
(ii)

(iii)

SULIT

SULIT

- (b) Rajah 13.2 menunjukkan graf laju-masa bagi sebuah bas.
Diagram 13.2 shows the speed-time graph of a bus.



Rajah 13.2 / Diagram 13.2

Diberi bahawa jumlah jarak yang dilalui oleh bas ialah 5.5 km. Hitung tempoh masa, dalam minit, bas tersebut bergerak dengan laju seragam.

It is given that the total distance travelled by bus was 5.5 km. Calculate the duration, in minutes, the bus moved at a uniform speed.

[4 markah/marks]

Jawapan / Answer :

(b)

SULIT

SULIT

- 14 Fahmirah tinggal di Kuala Lumpur dan ingin membeli sebuah van baharu. Van yang menarik perhatiannya adalah seperti yang ditunjukkan pada Rajah 14.
Fahmirah lives in Kuala Lumpur and wants to buy a new van. The van that attracts her interest is as shown in Diagram 14.

 Van E	Kapasiti enjin <i>Engine capacity</i>	: 2 500 cc
	Harga van baharu <i>Price of the new van</i>	: RM123 000
	Wang pendahuluan <i>Down payment</i>	: 20% daripada harga van 20% of van price

Rajah 14 / Diagram 14

- (a) Bank R menawarkan kadar faedah 4% setahun untuk pinjaman bagi van E. Jika Fahmirah menjelaskan wang pendahuluan bagi van E dan ingin membuat pinjaman untuk 9 tahun, berapakah ansuran bulanan yang perlu dibayarnya?
Bank R offers an annual interest rate of 4% for the loan of van E. If Fahmirah pays the down payment for van E and wants to get a loan for 9 years, what is the monthly instalment payable by her?

[4 markah/marks]

Jawapan / Answer :

(a)

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- (b) Jadual 14.1 menunjukkan kadar premium Tarif Motor bagi Semenanjung Malaysia.
Table 14.1 shows the premium rates under the Motor Tariff issued in Peninsular Malaysia.

Kapasiti enjin tidak melebihi <i>Engine capacity not exceeding (cc)</i>	Polisi komprehensif <i>Comprehensive policy (RM)</i>	Polisi pihak ketiga <i>Third party policy (RM)</i>
2 200	339.10	151.20
3 050	372.60	167.40

Jadual 14.1 / *Table 14.1*

Jadual 14.2 menunjukkan rumus mengira premium asas polisi komprehensif.
Table 14.2 shows the formulae to calculate the basic premium of the comprehensive policy.

Semenanjung Malaysia <i>Peninsular Malaysia</i>	Sabah dan Sarawak <i>Sabah and Sarawak</i>
Kadar bagi RM1 000 yang pertama + RM26 bagi setiap RM1 000 atau sebahagian daripada itu bagi nilai yang melebihi RM1 000 <i>Rate for the first RM1 000 + RM26 for each RM1 000 or part thereof on value exceeding the first RM1 000</i>	Kadar bagi RM1 000 yang pertama + RM20.30 bagi setiap RM1 000 atau sebahagian daripada itu bagi nilai yang melebihi RM1 000 <i>Rate for the first RM1 000 + RM20.30 for each RM1 000 or part thereof on value exceeding the first RM1 000</i>

Jadual 14.2 / *Table 14.2*

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Pada tahun kedua, Fahmirah ingin memperbaharui insurans vannya dengan nilai muka RM105 000. Nilai Diskaun Tanpa Tuntutan (NCD) pada tahun itu ialah 25%. Hitung premium kasar yang akan dibayar oleh Fahmirah jika dia ingin membeli:

In the second year, Fahmirah wants to renew her van insurance with a face value of RM105 000. The Non-Claimable Discount (NCD) value for that year is 25%. Calculate the gross premium that will be paid by Fahmirah if she wants to buy:

- (i) polisi komprehensif,
a comprehensive policy,
- (ii) polisi pihak ketiga.
a third party policy.

[5 markah/marks]

Jawapan / Answer :

(b) (i)

(ii)

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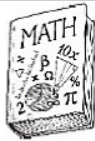
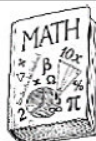
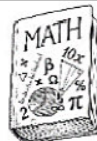
- 15 (a) Diberi $\frac{1}{m} \begin{pmatrix} -7 & 3 \\ -3 & 2 \end{pmatrix} \begin{pmatrix} 2 & n \\ 3 & -7 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, cari nilai m dan n .

Given that $\frac{1}{m} \begin{pmatrix} -7 & 3 \\ -3 & 2 \end{pmatrix} \begin{pmatrix} 2 & n \\ 3 & -7 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, find the values of m and n .

[2 markah/marks]

- (b) (i) Jadual 15 menunjukkan bilangan buku dan kotak pensel yang dibeli oleh Esther dan Paul di sebuah kedai alat tulis.

Table 15 shows the number of books and pencil cases purchased by Esther and Paul at a stationery shop.

Esther					
Paul					

Jadual 15 / Table 15

Esther telah membayar sebanyak RM77.00 untuk alat tulis yang telah dibelinya. Paul telah menerima baki bayaran sebanyak RM14.00 setelah dia membayar dengan duit sebanyak RM100. Dengan menggunakan kaedah matriks, hitung harga bagi sebuah buku dan sebuah kotak pensel. *Esther paid RM77.00 for the stationery she bought. Paul received the remaining payment of RM14.00 after he paid with RM100. By using the matrix method, calculate the price of a book and a pencil case.*

[5 markah/marks]

- (ii) Idealleon mempunyai RM100, dia ingin membeli 3 buah buku dan 5 kotak pensel. Adakah dia mempunyai wang yang cukup untuk membeli alat tulis tersebut? Justifikasikan jawapan anda dengan menggunakan pendaraban matriks.

Idealleon has RM100, he wants to buy 3 books and 5 pencil cases. Does he have enough money to buy the stationery? Justify your answer by using matrix multiplication.

[2 markah/marks]

SULITJawapan / *Answer* :

(a)

(b) (i)

(ii)

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SULIT

Bahagian C

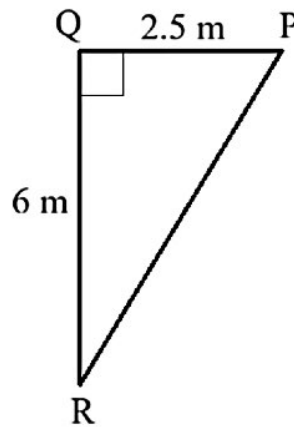
[15 markah]

*Bahagian ini mengandungi **dua** soalan. Jawab **satu** soalan.*

- 16 Sirhan ialah seorang jurulatih memanah yang bertauliah dari sebuah pusat memanah.
Sirhan is a certified archery coach from an archery center.

- (a) Rajah 16.1 menunjukkan kedudukan tiga tiang, P, Q dan R yang dipasang untuk melatih pemanah di sebuah padang latihan.

Diagram 16.1 shows the positions of the three poles, P, Q, and R that are set up in order to train archers at a training ground.



Rajah 16.1 / Diagram 16.1

Namakan bentuk geometri yang terbentuk daripada tiang P, Q dan R.
 Seterusnya, hitung panjang PR.

Name the geometric shape formed by poles P, Q and R. Hence, calculate the length of PR.

[3 markah/marks]

Jawapan / Answer :

- (a)

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- (b) Dalam satu pertandingan dalaman, dua orang anak murid Sirhan iaitu Zarif dan Syafi bertanding secara individu. Kebarangkalian Zarif dan Syafi layak ke pusingan kedua masing-masing ialah $\frac{2}{3}$ dan $\frac{1}{2}$. Hitung kebarangkalian bahawa Zarif atau Syafi layak ke pusingan kedua.

In an internal competition, two of Sirhan's students, Zarif and Syafi, competed individually. The probabilities that Zarif and Syafi qualify for the second round are $\frac{2}{3}$ and $\frac{1}{2}$ respectively. Calculate the probability that Zarif or Syafi qualifies for the second round.

[3 markah/marks]

Jawapan / Answer :

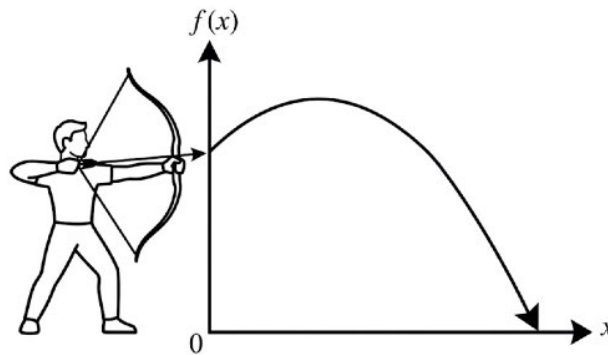
(b)

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SULIT

- (c) Sirhan sedang melatih anak muridnya di sebuah padang latihan. Lintasan anak panah yang dilepaskan boleh dimodelkan oleh fungsi kuadratik, $f(x) = -x^2 + 2x + 1.7$, di mana $f(x)$ ialah ketinggian, dalam meter, anak panah dari tanah dan x ialah jarak mendatar, dalam meter. Rajah 16.2 menunjukkan lintasan anak panah yang dilepaskan oleh anak murid Sirhan.

Sirhan is training his students at a practice field. The path of the arrow released can be modelled by a quadratic function, $f(x) = -x^2 + 2x + 1.7$, where $f(x)$ represents the height of the arrow, in metres, above the ground, and x represents the horizontal distance, in metres. Diagram 16.2 shows the path of the arrow released by Sirhan's student.



Rajah 16.2 / Diagram 16.2

Cari tinggi maksimum, dalam m, yang dicapai oleh anak panah dari tanah.

Find the maximum height, in m, reached by the arrow above the ground.

[4 markah/marks]

Jawapan / Answer :

(c)

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- (d) Rajah 16.3 menunjukkan skor Syafi dalam sesi latihan memanah.
Diagram 16.3 shows Syafi's scores in archery training sessions.

6, 8, 7, 9, 5, 8, 7, 10

Rajah 16.3 / *Diagram 16.3*

- (i) Hitung min skor dan sisihan piawai bagi Syafi.
Calculate the mean score and standard deviation for Syafi.
- (ii) Sirhan ingin memilih salah seorang daripada Syafi dan Zarif untuk mewakili sekolah dalam pertandingan memanah peringkat daerah. Diberi min skor bagi Zarif ialah 7.65 dan sisihan piawainya ialah 0.43. Tentukan siapakah yang layak dipilih dan beri justifikasi anda.
Sirhan wants to select either Syafi or Zarif to represent the school in the district level archery competition. Given that Zarif's mean score is 7.65 and his standard deviation is 0.43. Determine who should be selected to participate in the archery competition and give your justification.

[5 markah/marks]

Jawapan / *Answer* :

(d) (i)

(ii)

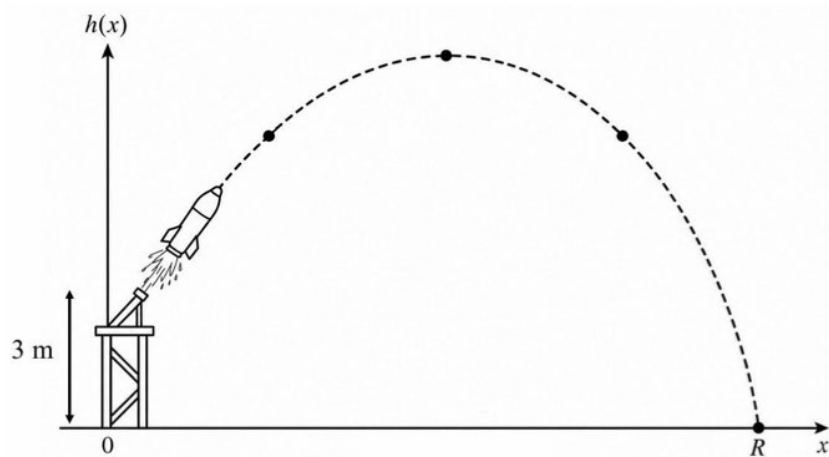
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- 17 Marzuki ialah seorang murid di SMK Regalia. Semasa Karnival STEM sekolah, Marzuki telah menyertai pertandingan roket air.

Marzuki is a student at SMK Regalia. During the school's STEM Carnival, Marzuki participated in a water rocket competition.

- (a) Rajah 17.1 menunjukkan lintasan roket air yang dilancarkan oleh Marzuki. Diberi bahawa ketinggian pelancar roket air ialah 3 m. Lintasan roket air membentuk parabola dan diungkapkan dengan fungsi $h(x) = ax^2 + \frac{5}{2}x + 3$.
Diagram 17.1 shows the path of a water rocket launched by Marzuki. It is given that the height of the water rocket launcher is 3 m. The path forms a parabola and is represented by the function $h(x) = ax^2 + \frac{5}{2}x + 3$.



Rajah 17.1 / Diagram 17.1

- (i) Nyatakan julat bagi nilai a .
State the range of values of a . [1 markah/mark]
- (ii) Roket air itu mendarat di titik R . Diberi jarak mengufuk titik R dari pelancar roket air ialah 6 m. Hitung ketinggian maksimum yang dicapai oleh roket air itu dari permukaan tanah.
The water rocket lands at point R . Given that the horizontal distance of point R from the launcher is 6 m, calculate the maximum height reached by the water rocket from the ground. [4 markah/marks]

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Jawapan / Answer :

- (a) (i)
- (ii)

- (b) Seramai 30 orang murid dari SMK Regalia menyertai pertandingan roket air. Jadual 17 menunjukkan taburan kekerapan kos penghasilan roket air, dalam RM, bagi 30 orang peserta tersebut.
A total of 30 students from SMK Regalia participated in the water rocket competition. Table 17 shows the frequency distribution of the cost of producing the water rockets, in RM, for the 30 participants.

Kos penghasilan roket air (RM) <i>Cost of producing the water rockets (RM)</i>	Bilangan peserta <i>Number of participants</i>
3 – 7	5
8 – 12	10
13 – 17	12
18 – 22	3

Jadual 17 / Table 17

Hitung sisihan piawai kos penghasilan roket air, dalam RM.
Calculate the standard deviation of the production cost of the water rockets, in RM.

[3 markah/marks]

Jawapan / Answer :

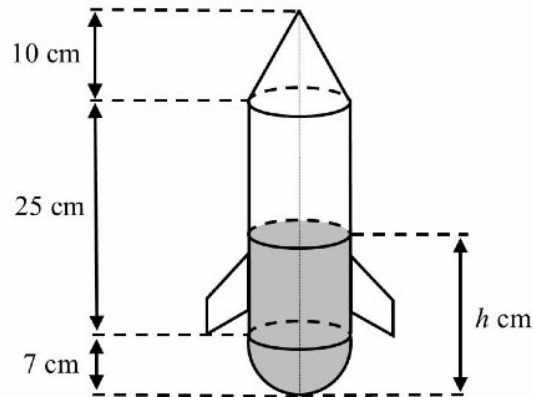
- (b)

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SULIT

- (c) Rajah 17.2 menunjukkan rekaan roket air bagi Marzuki yang dibentuk daripada hemisfera, silinder tegak dan kon tegak.

Diagram 17.2 shows the design of Marzuki's water rocket, which is formed by hemisphere, right circular cylinder, and right cone.



Rajah 17.2 / Diagram 17.2

Diberi bahawa jejari hemisfera ialah 7 cm, manakala tinggi silinder dan tinggi kon masing-masing ialah 25 cm dan 10 cm. Jika $\frac{1}{3}$ daripada isipadu roket air diisi dengan air, maka ketinggian air dalam roket tersebut ialah h cm. Dengan menggunakan $\pi = \frac{22}{7}$, hitung nilai h , dalam cm.

Given that the radius of the hemisphere is 7 cm, while the heights of the cylinder and cone are 25 cm and 10 cm respectively. If $\frac{1}{3}$ of the volume of the water rocket is filled with water, then the height of the water in the rocket is h cm. By using $\pi = \frac{22}{7}$, calculate the value of h , in cm.

[5 markah/marks]

Jawapan / Answer :

(c)

SULIT

SULIT

- (d) Selepas membuat kajian, Marzuki mendapati bahawa jarak mengufuk roket air, l , boleh diwakili dengan rumus seperti berikut:

$$l = \frac{u^2}{g} (2 \sin \theta \cos \theta)$$

di mana u ialah halaju awal roket air, g ialah graviti bumi dan θ ialah sudut pelancaran roket. Diberi bahawa graviti bumi ialah 10 m s^{-2} . Marzuki telah melancarkan roket air pada dua sudut yang berbeza, iaitu 30° dan 45° dengan kelajuan awal yang sama, 30 m s^{-1} . Nyatakan sudut pelancaran yang menghasilkan jarak maksimum. Berikan justifikasi anda.

After conducting a study, Marzuki found that the horizontal distance of the water rocket, l , can be represented by the formula as following:

$$l = \frac{u^2}{g} (2 \sin \theta \cos \theta)$$

where u is the initial velocity of the water rocket, g is the acceleration due to gravity, and θ is the launch angle of the rocket. It is given that the acceleration due to gravity is 10 m s^{-2} . Marzuki launched the water rocket at two different angles, 30° and 45° , with the same initial velocity of 30 m s^{-1} . State the launch angle that produces the maximum distance. Give your justification.

[2 markah/marks]

Jawapan / Answer :

(d)

KERTAS PEPERIKSAAN TAMAT



SULIT