

NAMA : KELAS :

NO. KAD PENGENALAN :

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Matematik

Kertas 2 (1449/2)

Julai 2026

PEPERIKSAAN PERCUBAAN SPM TAHUN 2026

MATEMATIK TINGKATAN 5

Kertas 2

2 jam 30 minit

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Tulis **nama**, **kelas** dan **no. kad pengenalan** anda pada ruang atas kertas peperiksaan ini.
2. Kertas peperiksaan ini adalah dalam dwibahasa.
3. Kertas peperiksaan ini mengandungi tiga bahagian: **Bahagian A**, **Bahagian B** dan **Bahagian C**.
4. Jawab **semua** soalan dalam **Bahagian A** dan **Bahagian B**.
5. Jawab **satu** soalan sahaja dalam **Bahagian C**.
6. Tulis jawapan anda pada ruang yang disediakan dalam kertas peperiksaan ini.
7. Tunjukkan kerja mengira anda. Ini membantu anda untuk mendapatkan markah.
8. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
9. Senarai rumus disediakan di halaman 2 hingga 4.

Untuk Kegunaan Pemeriksa			
Bahagian	Soalan	Markah penuh	Markah diperolehi
A	1	5	
	2	3	
	3	3	
	4	4	
	5	4	
	6	4	
	7	4	
	8	5	
	9	4	
	10	4	
B	11	9	
	12	9	
	13	8	
	14	10	
	15	9	
C	16	15	
	17	15	
Jumlah			

Kertas peperiksaan ini mengandungi 36 halaman bercetak

NOMBOR DAN OPERASI NUMBER AND OPERATIONS

- | | |
|--|--|
| <p>1 $a^m \times a^n = a^{m+n}$</p> <p>3 $(a^m)^n = a^{mn}$</p> <p>5 $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}} = \left(a^{\frac{1}{n}}\right)^m$</p> <p>7 Faedah mudah / <i>Simple interest</i>,
$I = Prt$</p> <p>9 Jumlah bayaran balik / <i>Total repayment</i>, $A = P + Prt$</p> <p>10 $\text{Premium} = \frac{\text{Nilai muka polisi}}{\text{RMx}} \times (\text{Kadar premium per RMx})$
 $\text{Premium} = \frac{\text{Face value of policy}}{\text{RMx}} \times (\text{Premium rate per RMx})$</p> <p>11 Jumlah insurans yang harus dibeli = $\left(\begin{smallmatrix} \text{Peratusan} \\ \text{ko insurans} \end{smallmatrix}\right) \times \left(\begin{smallmatrix} \text{Nilai boleh} \\ \text{insurans harta} \end{smallmatrix}\right)$
 <i>Amount of required insurance</i> = $\left(\begin{smallmatrix} \text{Percentage of} \\ \text{co - insurance} \end{smallmatrix}\right) \times \left(\begin{smallmatrix} \text{Insurable value} \\ \text{of property} \end{smallmatrix}\right)$</p> | <p>2 $a^m \div a^n = a^{m-n}$</p> <p>4 $a^{\frac{1}{n}} = \sqrt[n]{a}$</p> <p>6 $a^{\frac{m}{n}} = \sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m$</p> <p>8 Nilai matang / <i>Maturity value</i>,
$MV = P \left(1 + \frac{r}{n}\right)^{nt}$</p> |
|--|--|

PERKAITAN DAN ALGEBRA RELATIONSHIP AND ALGEBRA

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

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 = $\pi d = 2 \pi r$
Circumference of circle = $\pi d = 2 \pi r$
- 4 Luas bulatan = πr^2
Area of circle = πr^2
- 5 Panjang lengkok = $\frac{\theta}{360^\circ} \times 2\pi r$
Arc length = $\frac{\theta}{360^\circ} \times 2\pi r$
- 6 Luas sektor = $\frac{\theta}{360^\circ} \times \pi r^2$
Area of sector = $\frac{\theta}{360^\circ} \times \pi r^2$
- 7 Luas layang = $\frac{1}{2} \times$ hasil darab panjang dua pepenjuru
Area of kite = $\frac{1}{2} \times$ product of the length 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 two parallel sides $\times$ height
- 9 Luas permukaan silinder = $2\pi r^2 + 2\pi rh$
Surface area of cylinder = $2\pi r^2 + 2\pi rh$
- 10 Luas permukaan kon = $\pi r^2 + \pi rs$
Surface area of cone = $\pi r^2 + \pi rs$
- 11 Luas permukaan sfera = $4\pi r^2$
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 = $\pi r^2 h$
Volume of cylinder = $\pi r^2 h$

- 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 = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
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, $\sigma^2 = \frac{\sum (x - \bar{x})^2}{N} = \frac{\sum x^2}{N} - \bar{x}^2$
- 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 $P(A') = 1 - P(A)$

Bahagian A

[40 markah]

Jawab **semua** soalan dalam bahagian ini.

- 1 (a) Tulis dua implikasi berdasarkan pernyataan berikut.
Write two implications on the following statement.

“40 ialah nombor genap jika dan hanya jika 40 boleh dibahagi tepat dengan 10”
 “40 is an even number if and only if 40 is divisible by 10”

[2 markah / marks]

Jawapan / Answer :

- (a) Implikasi 1 / *Implication 1* :

.....

Implikasi 2 / *Implication 2* :

.....

- (b) Tentukan antejadian dan akibat daripada implikasi di bawah.
Determine the antecedent and consequent from the implication given below.

Jika $(m + 7)(m - 7) \neq 0$ maka $m^2 \neq 49$
If $(m + 7)(m - 7) \neq 0$ then $m^2 \neq 49$

[2 markah / marks]

Jawapan / Answer :

- (b) Antejadian / *Antecedent* :

Akibat / *Consequent* :

- (c) Tulis **Premis 2** untuk melengkapkan hujah berikut:
 Write down **Premise 2** to complete the following argument:

Premis 1 : Jika r ialah faktor bagi 6, maka 6 boleh dibahagi tepat dengan r .

Premise 1 : If r is a factor of 6, then 6 is divisible by r .

Premis 2 :

Premise 2 :

Kesimpulan : 2 bukan faktor bagi 6.

Conclusion : 2 is not a factor of 6.

[1 markah / mark]

Jawapan / Answer :

(c)

Premis 2 / Premise 2 :

.....

- 2 Mira dan suaminya makan tengah hari di sebuah hotel. Mereka memesan dua pinggan nasi goreng, segelas jus oren dan secawan air suam. Jadual 1 menunjukkan harga makanan dan minuman. Hotel tersebut mengenakan 6% cukai perkhidmatan.
Mira and her husband had lunch in a hotel. They had two plates of fried rice, a glass of orange juice and a cup of warm water. Table 1 shows the price of the food and drinks. The hotel charges 6% on service tax.

Makanan dan Minuman <i>Food and Drink</i>	Harga (RM) <i>Price (RM)</i>
Nasi goreng / <i>Fried rice</i>	25.90 sepinggan / <i>a plate</i>
Jus oren / <i>Orange juice</i>	15.70 segelas / <i>a glass</i>
Air kosong / <i>Warm water</i>	Percuma / <i>Free of charge</i>

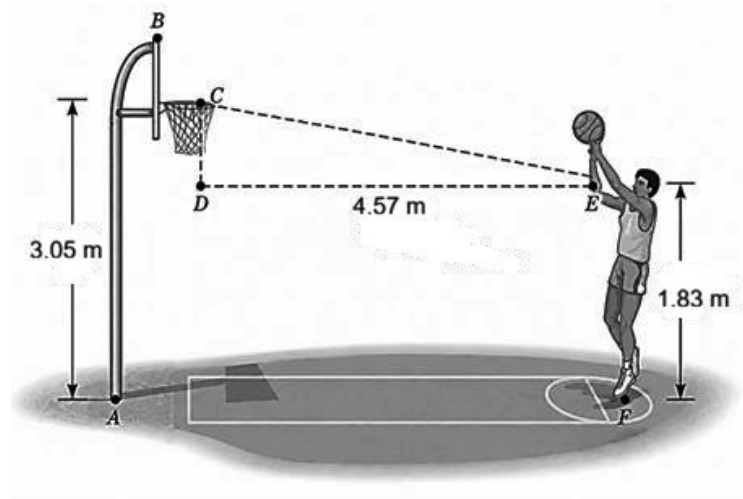
Jadual 1 / *Table 1*

Hitung bil Mira.
Calculate Mira's bill.

[3 markah / *marks*]

Jawapan / *Answer* :

- 3 Rajah 1 menunjukkan seorang pemain bola keranjang berada di garisan lemparan bebas yang berjarak 4.57 m dari pusat rim bola. Rim bola dan aras mata pemain itu masing-masing berada setinggi 3.05 m dan 1.83 m di atas gelanggang mengufuk. *Diagram 1 shows a basketball player is at the free-throw line, which is 4.57 m away from the centre of the basket rim. The basket rim and the eyes of the player are 3.05 m and 61.83 m above the horizontal court respectively.*



Rajah 1 / Diagram 1

- (a) Nyatakan sudut dongakan pusat rim bola daripada mata pemain bola tersebut.
State the angle of elevation of the centre of the rim from the player's eyes.

[1 markah / mark]

Jawapan / Answer :

(a)

- (b) Seterusnya, hitung sudut dongakan tersebut.
Hence, calculate the angle of elevation.

[2 markah / marks]

Jawapan / Answer :

(b)

- 4 (a) Hitung nilai bagi setiap yang berikut :
Calculate the value of each of the following :

(i) $101_2 + 110_2$

(ii) $475_8 - 67_8$

[2 markah / marks]

Jawapan / Answer :

(a) (i)

(ii)

- (b) Tukarkan 2305_6 kepada nombor dalam asas sepuluh.
Convert 2305_6 to a number in base ten.

[2 markah / marks]

Jawapan / Answer :

(b)

- 5 Satu tinjauan telah dijalankan ke atas 20 orang murid Tingkatan 5 di sebuah sekolah tentang penggunaan aplikasi media sosial di kalangan pelajar. Hasil tinjauan menunjukkan 12 orang murid menggunakan aplikasi TikTok (T), 10 orang murid menggunakan aplikasi Instagram (I) dan 3 orang murid menggunakan kedua-dua aplikasi tersebut. Sebahagian murid pula tidak menggunakan mana-mana aplikasi tersebut.

A survey was conducted on 20 Form 5 students in a school regarding the use of social media applications among the students. The results of the survey showed that 12 students use the TikTok (T) application, 10 students use the Instagram (I) application and 3 students use both applications. A number of students do not use either of the applications.

- (a) Lukis gambar rajah Venn dengan menggunakan maklumat di atas.
Draw a Venn diagram by using the information above.

[2 markah / marks]

Jawapan / Answer :

(a)

- (b) Berdasarkan gambar rajah Venn di 5(a), tentukan
Based on the Venn diagram in 5(a), determine

- (i) bilangan murid yang menggunakan satu aplikasi sahaja.
the number of students who use only one application.

[1 markah / mark]

- (ii) $n(T \cup I)$

[1 markah / mark]

Jawapan / Answer :

(b) (i)

(ii)

- 6 (a) Lengkapkan Jadual 2 di ruang jawapan bagi fungsi $y = \frac{4}{x}$ untuk $-4 \leq x \leq 4$.
Complete Table 2 in the answer space for the equation $y = \frac{4}{x}$ for $-4 \leq x \leq 4$.
 [1 markah / mark]

- (b) Seterusnya, menggunakan Jadual 2 lukis graf $y = \frac{4}{x}$ untuk $-4 \leq x \leq 4$.
Hence, using Table 2 draw the graph of $y = \frac{4}{x}$ for $-4 \leq x \leq 4$.
 [3 markah / marks]

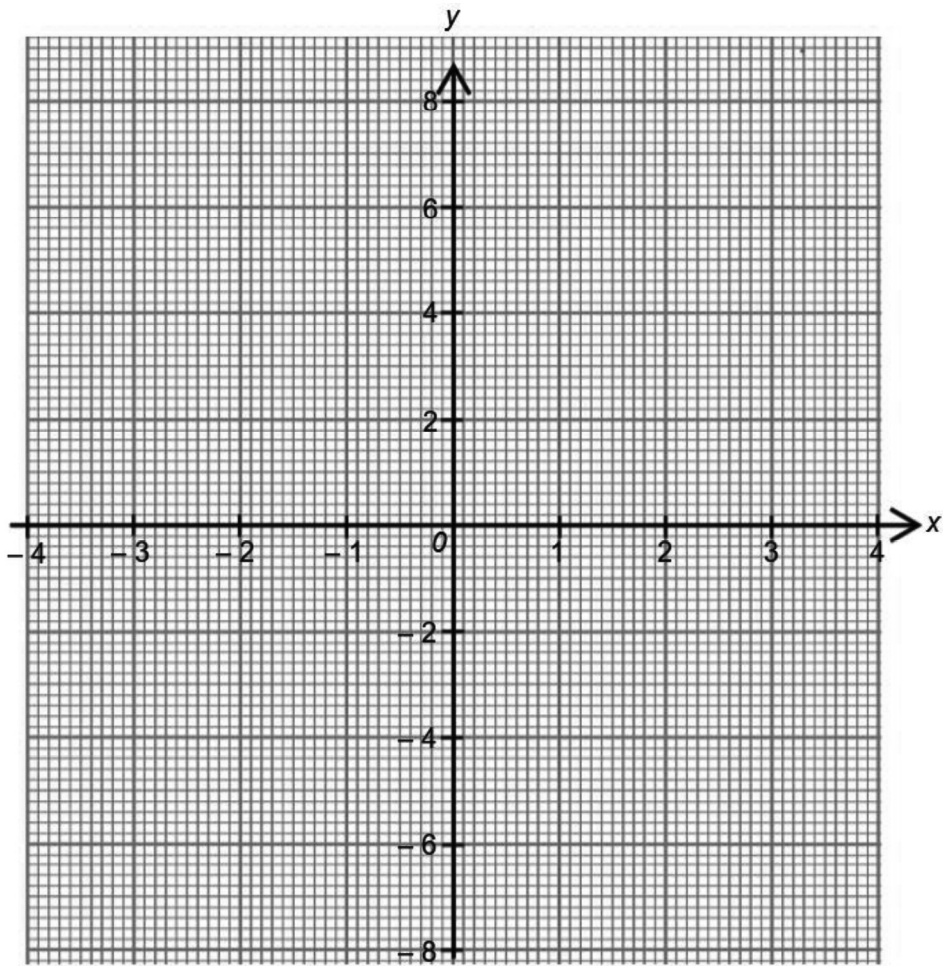
Jawapan / Answer :

(a)

x	-4	-2	-1	-0.5	0.5	1	2	4
y	-1	-2	-4	-8	8	4	2	

Jadual 2 / Table 2

(b)



- 7 Jadual 3 menunjukkan kadar premium tahunan bagi setiap RM1 000 nilai muka insurans boleh diperbaharui yang ditawarkan oleh sebuah syarikat insurans.
Table 3 shows the annual premium rate per RM1 000 face value of a renewable insurance offered by an insurance company.

Umur Age	Lelaki / Male		Perempuan / Female	
	Bukan perokok Non-smoker	Perokok Smoker	Bukan perokok Non-smoker	Perokok Smoker
21 – 25	2.52	3.48	2.28	2.40
26 – 30	2.64	3.60	2.40	2.52
31 – 35	2.76	3.84	2.52	2.64

Jadual 3 / Table 3

Encik Hafiz berumur 29 tahun dan bukan perokok.
Encik Hafiz is 29 years old and a non-smoker.

- (a) Hitung kadar premium bagi Encik Hafiz ?
Calculate the premium rate for Encik Hafiz ?

[1 markah / 1 mark]

Jawapan / Answer :

- (a)
- (b) Encik Hafiz bercadang ingin membeli polisi insurans hayat bernilai RM250 000 dan beliau ingin menambah perlindungan penyakit kritikal sebanyak 25% daripada nilai muka asas bagi melindungi kos rawatan penyakit jantung. Hitung jumlah premium tahunan yang perlu dibayar oleh Encik Hafiz.
[Diberi bahawa tambahan polisi penyakit kritikal dikenakan premium RM1.80 bagi setiap RM1 000 perlindungan tambahan].
Encik Hafiz plans to purchase a life insurance policy worth RM250 000 and he wishes to add critical illness coverage amounting to 25% of the basic face value to cover the cost of heart disease treatment. Calculate the total annual premium that Encik Hafiz has to pay.
[Given that a critical illness rider is charged at RM1.80 per RM1 000 additional coverage].

[3 markah / marks]

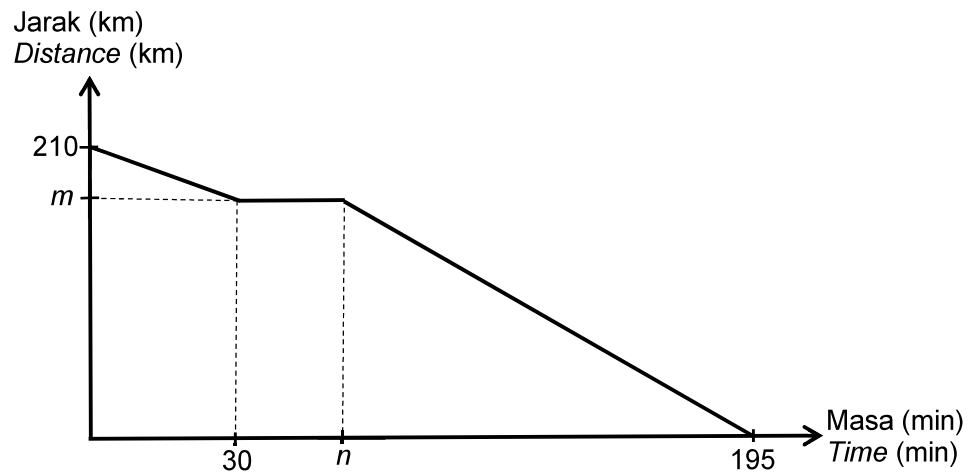
Jawapan / Answer :

- (b)

- 8 Jadual 4 menunjukkan catatan perjalanan Rosnah ke Genting Highlands dan Rajah 8 menunjukkan graf jarak-masa perjalanannya.
Table 4 shows Rosnah's travel to Genting Highlands and Diagram 8 shows the distance-time graph of her journey.

Masa Time	Catatan Notes
7:00 pagi 7:00 a.m.	Perjalanan dimulakan <i>Journey starts</i>
7:30 pagi 7:30 a.m.	Berehat di RnR Ayer Keroh selepas perjalanan sejauh 30 km <i>Rest at Ayer Keroh RnR after a 30 km journey</i>
7:45 pagi 7:45 a.m.	Meneruskan perjalanan <i>Continue journey</i>
10:15 pagi 10:15 a.m.	Tiba di Genting Highlands <i>Arrive at Genting Highlands</i>

Jadual 4 / Table 4



Rajah 8 / Diagram 8

- (a) Nyatakan nilai m dan nilai n .
State the values of m and n .

[2 markah / marks]

Jawapan / Answer :

(a) $m = \dots\dots\dots$

$n = \dots\dots\dots$

- (b) Nyatakan tempoh masa, dalam minit, Rosnah berhenti.
State the period of time, in minutes, Rosnah stop.

[1 markah / mark]

Jawapan / Answer :

(b)

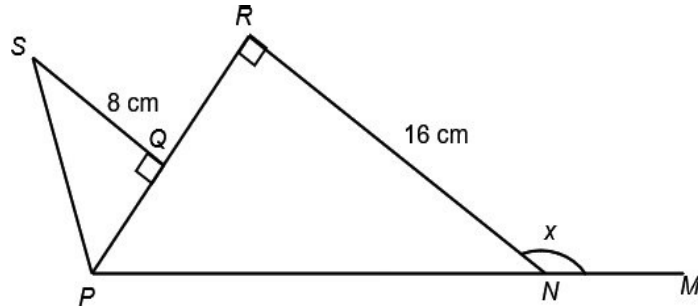
- (c) Hitung laju purata, dalam km h^{-1} bagi keseluruhan perjalanan Rosnah.
Calculate the average speed, in km h^{-1} , for Rosnah's whole journey.

[2 markah / marks]

Jawapan / Answer :

(c)

- 9 (a) Rajah 3 menunjukkan dua buah segi tiga bersudut tegak SPQ dan RPN . PNM ialah garis lurus dan $PQ = QR$.
Diagram 3 shows two right angled triangles SPQ and RPN . PNM is a straight line and $PQ = QR$.



Rajah 3 / Diagram 3

Diberi $\tan \angle QSP = \frac{3}{4}$, cari nilai bagi $\cos x$.

Given $\tan \angle QSP = \frac{3}{4}$, find the value of $\cos x$.

[2 markah / marks]

Jawapan / Answer :

(a)

- (b) Jadual 5 menunjukkan nilai-nilai bagi fungsi $y = \cos x$ untuk $0^\circ \leq x \leq 360^\circ$.
Table 5 shows the values for the equation $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$.

x	0°	90°	180°	270°	360°
$\cos x$ $\cos x$	1	0	-1	0	1

Jadual 5 / Table 5

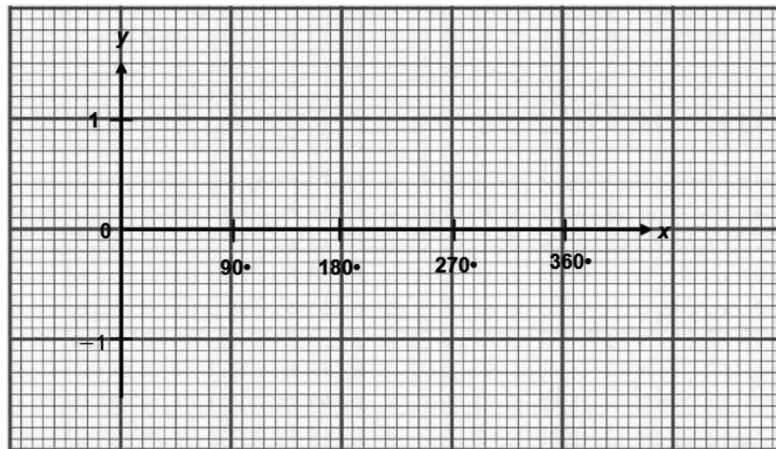
Lukis graf bagi $y = \cos x$ untuk $0^\circ \leq x \leq 360^\circ$.

Draw the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$.

[2 markah / marks]

Jawapan / Answer :

(b)



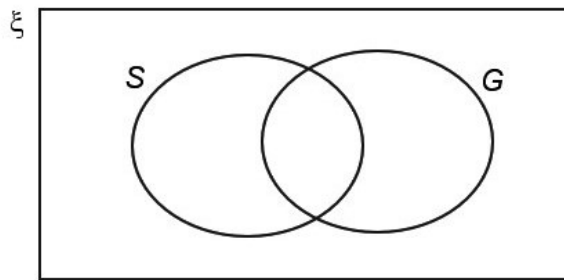
- 10 (a) Sarah dan Grace akan menghadiri majlis kenduri kahwin pada hujung minggu. Kebarangkalian bahawa Sarah dan Grace akan menghadiri majlis tersebut ialah $\frac{1}{4}$ dan $\frac{2}{7}$ masing-masing. Wakilkan kebarangkalian bahawa Sarah dan Grace menghadiri majlis kenduri kahwin dengan menggunakan gambar rajah Venn yang disediakan di ruang jawapan.

Sarah and Grace might attend a wedding party during weekend. The probability for Sarah and Grace to attend the party are $\frac{1}{4}$ and $\frac{2}{7}$ respectively. Represent the probability that Sarah and Grace attend the party by using a Venn diagram given in the answer space.

[2 markah / marks]

Jawapan / Answer :

(a)



- (b) Hitung kebarangkalian sama ada Sarah atau Grace menghadiri majlis kenduri kahwin.

Calculate the probability that Sarah or Grace attending the wedding party.

[2 markah / marks]

Jawapan / Answer :

(b)

Bahagian B

[45 markah]

Jawab **semua** soalan dalam bahagian ini.

- 11 (a) Diberi matriks $P = \begin{bmatrix} q & -4 \\ 2 & -1 \end{bmatrix}$, hitung nilai q jika matriks P tidak mempunyai matriks songsang.
 Given matrix $P = \begin{bmatrix} q & -4 \\ 2 & -1 \end{bmatrix}$, calculate the value of q if matrix P does not have an inverse matrix.

[2 markah / marks]

Jawapan / Answer :

(a)

- (b) Diberi $M = N$, hitung nilai x .
 Given $M = N$, calculate the value of x .

$$M = \begin{bmatrix} 2 + 4x \\ 3x + 4 \end{bmatrix} \text{ dan / and } N = \begin{bmatrix} 5x \\ 6x - 2 \end{bmatrix}$$

[2 markah / marks]

Jawapan / Answer :

(b)

- (c) Suatu kaji selidik telah dijalankan mengenai masa pembuatan dua jenis popia iaitu popia ayam dan popia daging. 25 biji popia ayam dan 20 biji popia daging dapat dibuat dalam masa 37 minit, manakala 35 biji popia ayam dan 24 biji popia daging dapat dibuat dalam masa 48 minit. Hitung masa, dalam minit, yang diperlukan untuk membuat 1 biji popia ayam dan 1 biji popia daging dengan menggunakan kaedah matriks.

A survey was conducted on the time taken to make two types of spring rolls, which are chicken spring rolls and beef spring rolls. 25 chicken spring rolls and 20 beef spring rolls can be made in 37 minutes while 35 chicken spring rolls and 24 beef spring rolls can be made in 48 minutes. Calculate the time, in minutes, needed to make 1 chicken spring roll and 1 beef spring roll by using the matrix method.

[5 markah / marks]

Jawapan / Answer :

(c)

- 12** Seorang murid menjalankan satu eksperimen untuk mengkaji ketahanan dua jenis larutan elektrolit dalam menghasilkan tenaga elektrik. Jadual 6 menunjukkan masa ketahanan, dalam jam, direkodkan bagi enam eksperimen.

A student carried out an experiment to investigate the durability of two types of electrolyte solutions in producing electrical energy. Table 6 shows the durability, in hours, recorded on six experiments.

Eksperimen Experiment	1	2	3	4	5	6
Ketahanan Larutan X (jam) Durability for Solution X (hours)	12	18	19	21	22	28
Ketahanan Larutan Y (jam) Durability for Solution Y (hours)	12	15	18	22	25	28

Jadual 6 / Table 6

- (a) Hitung sisihan piawai bagi data masa ketahanan larutan X dan larutan Y.
Calculate the standard deviation for the durability of solution X and solution Y.

[5 markah / marks]

Jawapan / Answer :

- (a)

- (b) Berdasarkan jawapan di **12(a)**, larutan manakah yang mempunyai ketahanan yang lebih konsisten. Berikan justifikasi anda.
Based on your answer in 12(a), which solution is more consistent in durability. Give your justification.

[2 markah / marks]

Jawapan / Answer :

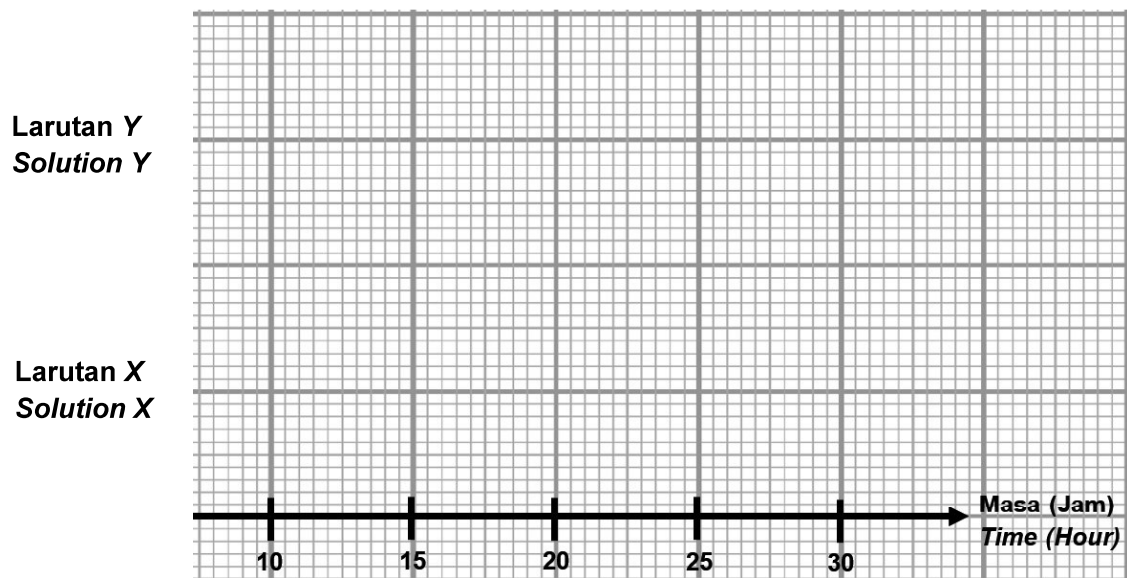
(b)

- (c) Pada ruang jawapan, bina plot kotak untuk mewakili data masa ketahanan larutan X dan larutan Y.
In the answer space, construct box plots to represent the durability of solution X and solution Y.

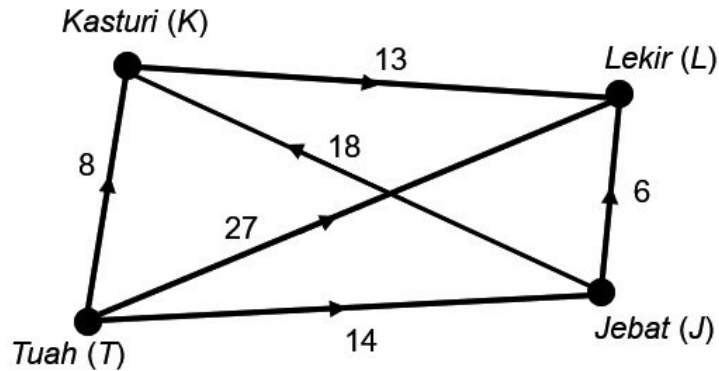
[2 markah / marks]

Jawapan / Answer :

(c)



- 13 (a) Rajah 4 menunjukkan graf terarah dan berpemberat, dalam km, kedudukan bagi empat buah stesen komuter.
 Diagram 4 shows a directed weighted graph, in km, the location of four commuter stations.



Rajah 4 / Diagram 4

Berdasarkan graf,
 Based on the graph,

- (i) Senaraikan set bucu,
 List the set of vertices,
 [1 markah / mark]
- (ii) Cari bilangan darjah,
 Find the sum of degrees,
 [1 markah / mark]
- (iii) Lukis satu pokok berpemberat berdasarkan graf di atas.
 Draw a weighted tree based on the graph above.
 [2 markah / marks]

Jawapan / Answer :

(a) (i)

(ii)

(iii)

- (b) Adam menaiki komuter dari Tuah ke Lekir.
Adam takes the commuter from Tuah to Lekir.

- (i) Hitung laluan terpendek yang akan dilalui.
Calculate the shortest route taken.

[2 markah / marks]

- (ii) Jadual 7 menunjukkan kadar bayaran.
Table 7 shows the fares charged.

Pasangan bucu <i>Vertex pair</i>	Kadar bayaran (RM) <i>Payment rate (RM)</i>
(T, J)	2.20
(T, K)	1.30
(T, L)	6.30
(J, K)	5.40
(J, L)	2.70
(K, L)	2.50

Jadual 7 / Table 7

Hitung kos yang akan ditanggung oleh Adam berdasarkan laluan di **13(b)(i)**.
*Calculate the cost to be borne by Adam based on the route in **13(b)(i)**.*

[2 markah / marks]

Jawapan / Answer :

(i)

(ii)

- 14** Theva merancang untuk menghasilkan beg tangan kain, x dan cekak rambut, y sempena jualan amal di sekolahnya. Penghasilan produk tersebut adalah berdasarkan syarat-syarat berikut :

Theva plans to produce fabric handbags, x and hairbands, y for her school charity sale. The production is based on the following conditions :

- I** Jumlah produk adalah tidak melebihi 60 unit.
The total number of products does not exceed 60 units.
- II** Bilangan cekak rambut adalah sekurang-kurangnya dua kali bilangan beg tangan kain.
The number of hairbands is at least twice the number of fabric handbags.

- (a) Tulis dua ketaksamaan linear, selain $x \geq 0$ dan $y \geq 0$, yang mewakili situasi di atas.

Write two linear inequalities, other than $x \geq 0$ and $y \geq 0$, that represent the above situation.

[2 markah / marks]

Jawapan / Answer :

- (a)

- (b) **Untuk ceraian soalan ini, gunakan kertas graf yang disediakan.**

For this part of the question, use graph papers provided.

Menggunakan skala 2 cm kepada 10 unit pada paksi- x dan 2 cm kepada 5 unit pada paksi- y , lukis dan lorek rantau yang memuaskan sistem ketaksamaan linear di **14(a)**.

*By using a scale of 2 cm to 10 units on the x -axis and 2 cm to 5 units on the y -axis, draw and shade the region that satisfies the system of linear inequalities in **14(a)**.*

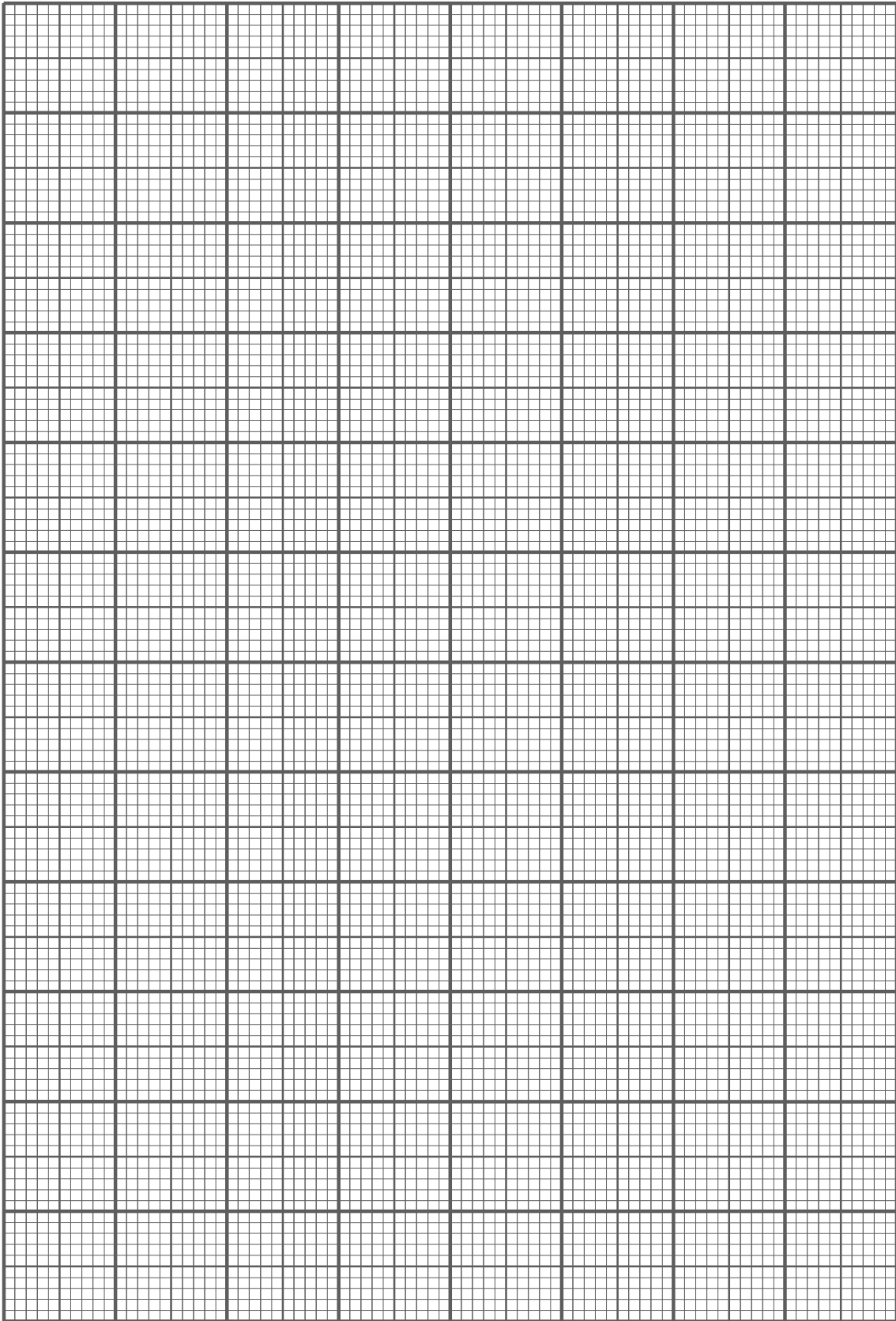
[4 markah / marks]

Jawapan / Answer :

- (b) Rujuk graf.

Refer graph.

Graf untuk Soalan **14(b)**
*Graph for Question **14(b)***



- (c) Berdasarkan graf yang dilukis di **14(b)**,
Based on the graph drawn in 14(b),
- (i) tentukan sama ada Theva boleh menghasilkan 10 unit beg tangan kain dan 30 unit cekak rambut. Berikan justifikasi anda.
determine whether Theva can produce 10 units of fabric handbags and 30 units of hairbands. Justify your answer.
 - (ii) nyatakan bilangan maksimum dan minimum cekak rambut, jika Theva menghasilkan 10 unit beg tangan kain.
state the maximum and minimum number of hairbands if Theva produces 10 units of fabric handbags.

[4 markah / marks]

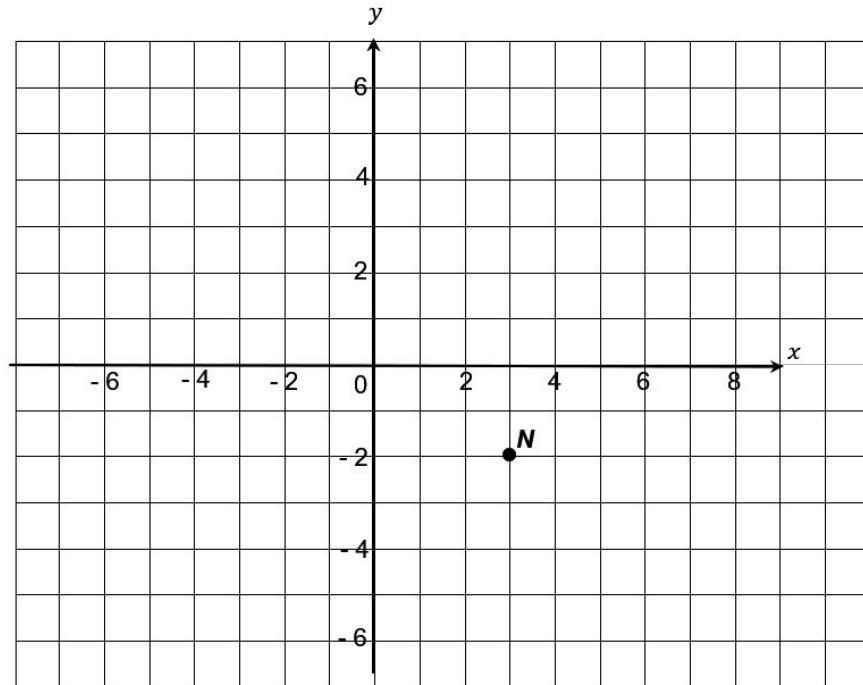
Jawapan / Answer :

(c) (i)

(ii) Bilangan minimum / *Minimum number* :

Bilangan maksimum / *Maximum number* :

- 15 (a) Rajah 5 menunjukkan titik N pada suatu satah Cartes.
Diagram 5 shows point N on a Cartesian plane.



Rajah 5 / Diagram 5

Transformasi T ialah translasi $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$.

Transformasi R ialah satu putaran 180° pada titik asalan.

Transformasi P ialah satu pantulan pada garis $y = 1$.

Nyatakan koordinat imej bagi titik N di bawah transformasi berikut:

Transformation T is a translation $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$.

Transformation R is a rotation of 180° about the origin.

Transformation P is a reflection in line $y = 1$.

State the coordinates of the image of point N under the following transformations:

(i) TP

(ii) PR

[4 markah / marks]

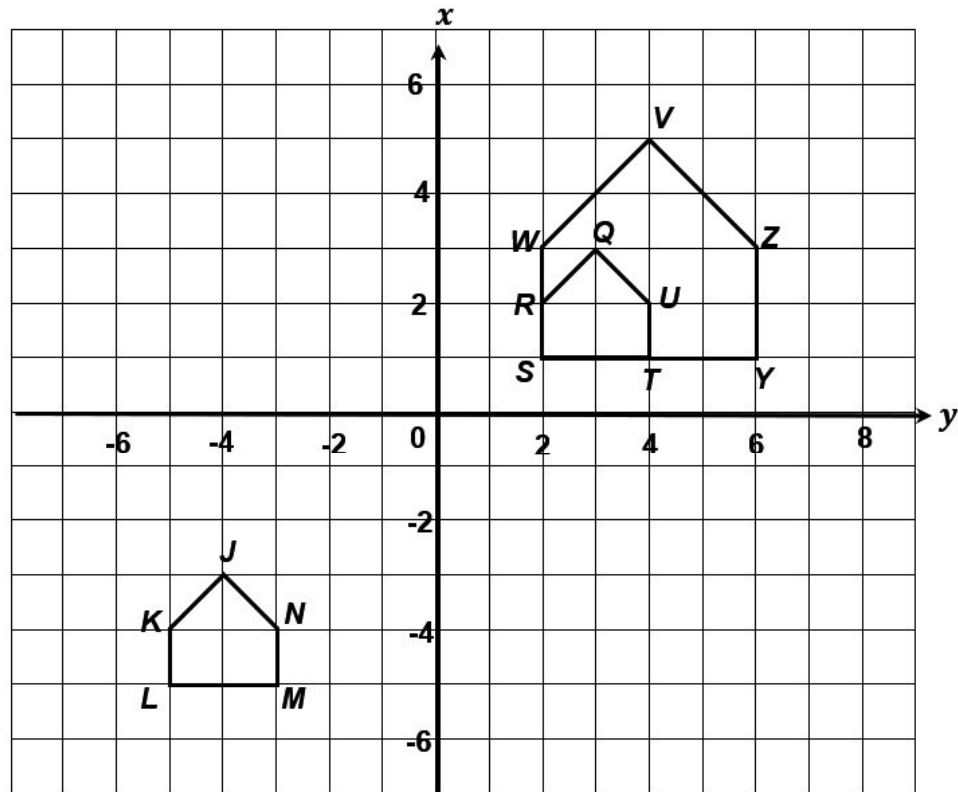
Jawapan / Answer :

(i)

(ii)

- (b) Rajah 6 menunjukkan tiga buah pentagon $JKLMN$, $QRSTU$ dan $VWSYZ$ dilukis pada satu satah Cartes.

Diagram 6 shows three pentagons $JKLMN$, $QRSTU$ and $VWSYZ$ drawn on a Cartesian plane.



Rajah 6 / Diagram 6

$VWSYZ$ ialah imej bagi $JKLMN$ di bawah gabungan transformasi HG .

Huraikan selengkapnya transformasi :

$VWSYZ$ is the image of $JKLMN$ under the combined transformation HG .

Describe in full the transformation :

(i) **G**

(ii) **H**

[5 markah / marks]

Jawapan / Answer :

(b) (i)

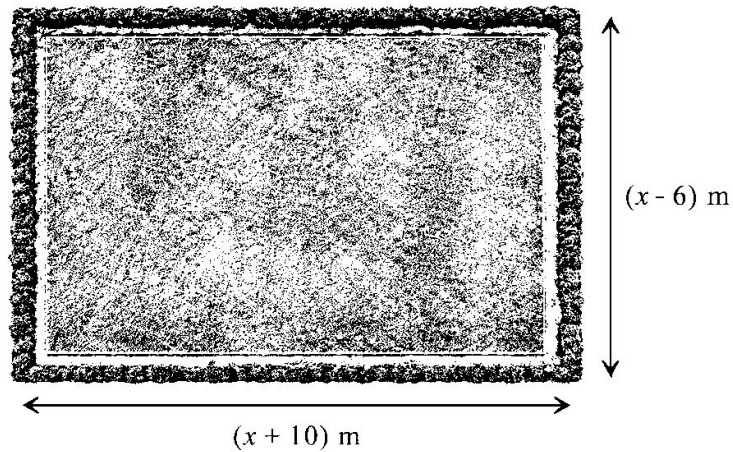
(b) (ii)

Bahagian C

[15 markah]

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

- 16 (a) Rajah 7 menunjukkan sebidang tanah milik Zaidi yang berbentuk segi empat tepat. Semasa musim kemarau, separuh daripada luas tanah itu tidak dapat digunakan menyebabkan luas kawasan boleh digunakan hanyalah 256 m^2 .
Diagram 7 shows a piece of land owned by Zaidi in the shape of rectangle. During the dry season, half of the area of the land could not be used, causing the remaining area to be used only 256 m^2 .



Rajah 7 / Diagram 7

Hitung perimeter kawasan yang boleh digunakan semasa musim kemarau.

Calculate the perimeter of the area that can be used during the dry season.

[4 markah / marks]

Jawapan / Answer :

(a)

- (b) Bagi memastikan bekalan air adalah mencukupi semasa musim kemarau, Zaidi bercadang untuk membeli beberapa tong air. Sebuah kedai berhampiran telah menawarkan dua pakej tong air kepadanya. Jadual 8 menunjukkan pakej yang ditawarkan.

To ensure that the water supply is sufficient during the dry season, Zaidi plans to purchase several water tanks. A nearby shop has offered him two water tank packages.

Table 8 shows the packages offered.

A	3 tong besar dan 2 tong kecil dapat menyimpan sebanyak 860 liter air. <i>3 big tanks and 2 small tanks can store a total of 860 litres of water.</i>
B	2 tong besar dan 4 tong kecil dapat menyimpan sebanyak 920 liter air. <i>2 big tanks and 4 small tanks can store a total of 920 litres of water.</i>

Jadual 8 / Table 8

Dengan menggunakan kaedah penggantian atau penghapusan, hitung kapasiti air bagi sebuah tong besar dan sebuah tong kecil.

By using the substitution or elimination method, calculate the capacity of water in a big tank and a small tank.

[4 markah / marks]

Jawapan / Answer :

(b)

- (c) Zaidi mendapati air perigi di belakang rumahnya semakin kering akibat cuaca panas. Paras air di dalam perigi itu telah menurun separuh berbanding paras asal. Rajah 8 menunjukkan paras air yang tinggal di dalam perigi itu sekarang. (Guna $\pi = \frac{22}{7}$).

Zaidi noticed that the water in the well behind his house is getting drier due to the hot weather. The water level in the well has decreased to half of its original level. Diagram 8 shows the current water level left in the well. (Use $\pi = \frac{22}{7}$).



Rajah 8 / Diagram 8

Diberi isi padu asal air perigi itu ialah 3.96 m^3 dan diameter perigi itu ialah 1.5 m . Hitung nilai t .

Given that the initial volume of the water in the well is 3.96 m^3 and the diameter of the well is 1.5 m . Calculate the value of t .

[3 markah / marks]

Jawapan / Answer :

(c)

- (d) Zaidi tidak dapat keluar bertani kerana kurang sihat akibat keadaan cuaca yang terlalu panas. Dia bercadang untuk membeli saham dengan melaburkan wang simpanannya berjumlah RM16 000. Jadual 9 menunjukkan pembelian saham Zaidi untuk empat bulan berturut-turut.

Zaidi could not go out to farm because he was unwell due to the extremely hot weather. He plans to invest in stock market with his savings amounting RM16 000. Table 9 shows the purchase of shares by Zaidi for four consecutive months.

Bulan Month	April	Mei May	Jun June	Julai July
Harga seunit (RM) Price per unit (RM)	RM1.05	RM1.03	RM1.00	RM1.06

Jadual 9 / Table 9

- (i) Hitung jumlah saham yang diperolehi.
Calculate the total number of shares obtained.

[2 markah / marks]

Jawapan / Answer :

(i)

- (ii) Hitung kos purata seunit saham bagi pembelian sahamnya.
Calculate the average cost per share for shares purchased by him.

[2 markah / marks]

Jawapan / Answer :

(ii)

- 17 (a) Syarikat Megah Holding menawarkan perkhidmatan penghantaran iaitu Megah Express. Caj penghantaran, C , dalam RM, adalah berkadar langsung dengan berat bungkusan, M , dalam kg, dan jarak penghantaran, D , dalam km. Diberi bahawa caj penghantaran bagi bungkusan seberat 4 kg untuk jarak 10 km ialah RM20.00.

Megah Holding Company offers a delivery service called Megah Express. The delivery charge, C , in RM, is varies directly to the weight of the package, M , in kg, and the delivery distance, D , in km. It is given that the delivery charge for a 4 kg package over a distance of 10 km is RM20.00.

- (i) Ungkapkan C dalam sebutan M dan D .
Express C in term of M and D .

[2 markah / marks]

Jawapan / Answer :

(i)

- (ii) Hitung jarak penghantaran, dalam meter, bagi bungkusan seberat 15 kg dengan caj penghantaran RM56.25.
Calculate the delivery distance, in meters, for a package weighing 15 kg with a delivery charge of RM56.25.

[2 markah / marks]

Jawapan / Answer :

(ii)

- (b) Selain menyediakan perkhidmatan penghantaran, Syarikat Megah Holding juga ada mengeluarkan produk minuman tenaga *Mega Boost* dalam dua saiz berbeza iaitu botol kecil (250 ml) dan botol besar (500 ml). Rajah 9 menunjukkan pakej-pakej yang disediakan.

In addition to providing delivery services, Megah Holding Company also produces the energy drink Mega Boost in two different sizes, a small bottle (250 ml) and a large bottle (500 ml). Diagram 9 shows the packages provided.



Rajah 9 / Diagram 9

- (i) Bentuk dua persamaan linear bagi situasi di atas.
Form two linear equations for the above situation.

[2 markah / marks]

Jawapan / Answer :

(i)

- (ii) **Penyelesaian dengan kaedah matriks tidak dibenarkan.**
Solving using matrix method is not allowed.

Cari harga bagi satu botol kecil dan satu botol besar air minuman bertenaga Mega Boost.

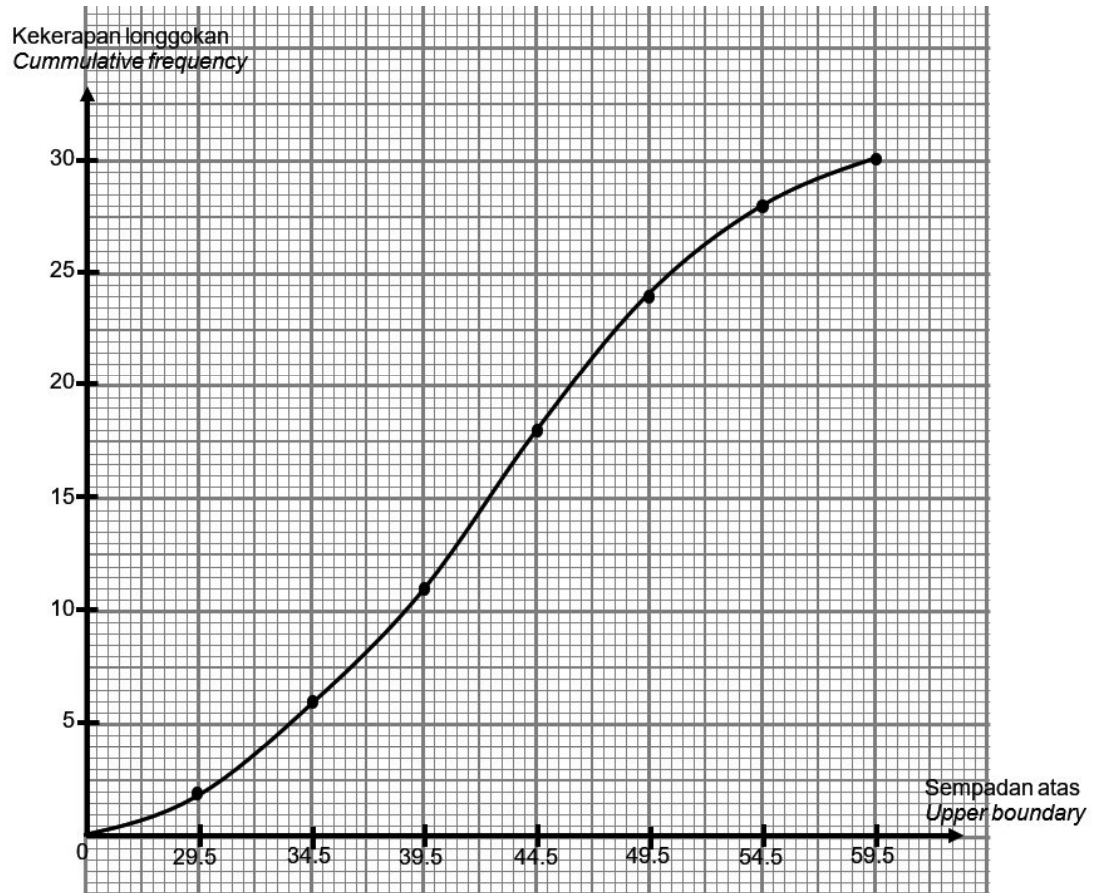
Find the price for one small bottle and one large bottle of Mega Boost energy drink.

[2 markah / marks]

Jawapan / Answer :

(ii)

- (c) Ogif pada Rajah 18 menunjukkan taburan kumulatif berat bungkusan yang dihantar oleh seorang penghantar bungkusan Syarikat Megah Holding dalam tempoh 30 hari.
The ogive in Diagram 18 shows the cumulative distribution of the parcel weights delivered by a parcel delivery worker of Megah Holding Company over a period of 30 days.



Rajah 18 / Diagram 18

Tentukan julat antara kuartil bagi jumlah berat bungkusan yang dihantar.
Determine the interquartile range of the total weight of parcels delivered.

[3 markah / marks]

Jawapan / Answer :

(c)

- (d) Syarikat Megah Holding telah membeli satu lot kedai dengan harga RM750 000 dan telah menjelaskan 10% daripada nilai belian lot kedai tersebut. Lot kedai tersebut disewakan selama 10 tahun dengan jumlah sewa sebanyak RM350 000. Setelah genap 10 tahun, lot kedai tersebut dijual pada harga RM1 450 000. Jumlah ansuran bulanan yang telah dilunaskan kepada pihak bank ialah RM525 000 dan masih mempunyai baki pinjaman RM575 000. Hitung nilai pulangan pelaburan yang diperoleh Syarikat Megah Holding.
- Syarikat Megah Holding purchased a shop lot for RM750 000 and paid 10% of the purchase price as an initial payment. The shop lot was rented out for 10 years with a total rental income of RM350 000. After 10 years, the shop lot was sold for RM1 450 000. The total monthly loan instalments paid to the bank amounted to RM525 000 and there was still an outstanding loan balance of RM575 000. Calculate the return on investment obtained by Syarikat Megah Holding.*

[4 markah / marks]

Jawapan / Answer :