

SULIT

NAMA :



TINGKATAN :

**PEJABAT PELAJARAN DAERAH
SEGAMAT, JOHOR**

**PEPERIKSAAN AKHIR TAHUN SETARA 2009
TINGKATAN EMPAT
MATHEMATICS**

1449/2

**Kertas 2
Oktober
2½ jam**

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis nama dan tingkatan anda pada ruangan yang disediakan.
2. Kertas soalan ini adalah dalam dwibahasa.
3. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.
5. Calon dikehendaki membaca maklumat di halaman 2.

<i>Pemeriksa</i>			
Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A	1	3	
	2	4	
	3	4	
	4	4	
	5	6	
	6	5	
	7	6	
	8	5	
	9	5	
	10	5	
	11	5	
B	12	12	
	13	12	
	14	12	
	15	12	
Jumlah			

Kertas soalan ini mengandungi 24 halaman bercetak.

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of two sections : **Section A** and **Section B**.
Kertas soalan ini mengandungi dua bahagian : Bahagian A dan Bahagian B.
2. Answer **all** questions in **Section A** and **Section B**.
Jawab semua soalan dalam Bahagian A dan Bahagian B.
3. Write your answers in the spaces provided in the question paper.
Tulis jawapan anda pada ruang yang disediakan dalam kertas soalan ini.
4. Show your working. It may help you to get marks.
Tunjukkan kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.
5. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
Jika anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.
6. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. The marks allocated for each question and sub-part of a question are shown in brackets.
Markah yang diperuntukkan bagi setiap soalan dan ceraihan soalan ditunjukkan dalam kurungan.
8. A list of formulae is provided on pages 3 to 5.
Satu senarai rumus disediakan di halaman 3 hingga 5.
9. A booklet of four-figure mathematical tables is provided.
Sebuah buku sifir matematik empat angka disediakan.
10. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.
11. Hand in this question paper to the invigilator at the end of the examination.
Serahkan kertas soalan ini kepada pengawas peperiksaan pada akhir peperiksaan.

MATHEMATICAL FORMULAE RUMUS MATEMATIK

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

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

RELATIONS PERKAITAN

- | | | | |
|---|---|----|---|
| 1 | $a^m \times a^n = a^{m+n}$ | 10 | Pythagoras Theorem
<i>Teorem Pithagoras</i> |
| 2 | $a^m \div a^n = a^{m-n}$ | | $c^2 = a^2 + b^2$ |
| 3 | $(a^m)^n = a^{mn}$ | 11 | $P(A) = \frac{n(A)}{n(S)}$ |
| 4 | $A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$ | 12 | $P(A') = 1 - P(A)$ |
| 5 | Distance / <i>Jarak</i>
$= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ | 13 | $m = \frac{y_2 - y_1}{x_2 - x_1}$ |
| 6 | Midpoint / <i>Titik tengah</i>
$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$ | 14 | $m = - \frac{\text{y-intercept}}{\text{x-intercept}}$ |
| 7 | Average speed = $\frac{\text{distance travelled}}{\text{time taken}}$

<i>Purata laju = $\frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$</i> | | $m = - \frac{\text{pint asan } - y}{\text{pint asan } - x}$ |
| 8 | Mean = $\frac{\text{sum of data}}{\text{number of data}}$

<i>Min = $\frac{\text{hasil tambah nilai data}}{\text{bilangan data}}$</i> | | |
| 9 | Mean = $\frac{\text{sum of (class mark} \times \text{frequency)}}{\text{sum of frequencies}}$

<i>Min = $\frac{\text{hasil tambah (nilai titik tengah} \times \text{kekerapan)}}{\text{hasil tambah kekerapan}}$</i> | | |

[Lihat sebelah
SULIT

SHAPES AND SPACE
BENTUK DAN RUANG

- 1 Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
Luas trapezium = $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$
- 2 Circumference of circle = $\pi d = 2\pi r$
Lilitan bulatan = $\pi d = 2\pi j$
- 3 Area of circle = πr^2
Luas bulatan = πj^2
- 4 Curved surface area of cylinder = $2\pi rh$
Luas permukaan melengkung silinder = $2\pi jt$
- 5 Surface area of sphere = $4\pi r^2$
Luas permukaan sfera = $4\pi j^2$
- 6 Volume of right prism = cross sectional area \times length
Isipadu prisma tegak = luas keratan rentas \times panjang
- 7 Volume of cylinder = $\pi r^2 h$
Isipadu silinder = $\pi j^2 t$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
Isipadu kon = $\frac{1}{3} \pi j^2 t$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
Isipadu sfera = $\frac{4}{3} \pi j^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
Isipadu piramid tegak = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
- 11 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
Hasil tambah sudut pedalaman poligon = $(n - 2) \times 180^\circ$

$$12 \quad \frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{panjang lengkuk}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$13 \quad \frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$14 \quad \text{Scale factor , } k = \frac{PA'}{PA}$$

$$\text{Faktor skala, } k = \frac{PA'}{PA}$$

$$15 \quad \text{Area of image} = k^2 \times \text{area of object}$$

$$\text{Luas imej} = k^2 \times \text{luas objek}$$

Section A
Bahagian A

[52 marks]
[52 markah]

Answer **all** questions in this section.
Jawab semua soalan *dalam bahagian ini*.

1. The Venn Diagram in the answer space shows sets , P, Q and R such that the universal sets,
 $\xi = P \cup Q \cup R$.

Gambar rajah Venn di ruang jawapan menunjukkan set P, set Q dan set R dengan keadaan set semesta,
 $\xi = P \cup Q \cup R$.

On the diagram in the answer space, shade
Pada rajah di ruang jawapan, lorekkan

(a) $P \cap R$

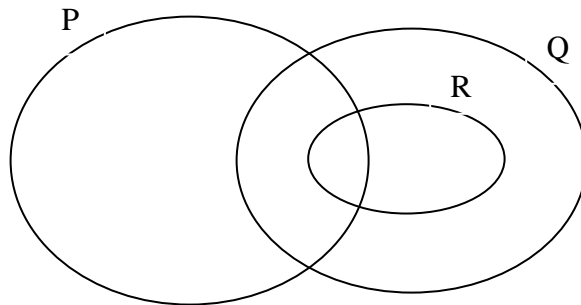
[1 marks]
[1 markah]

(b) $(P' \cup Q) \cap R$

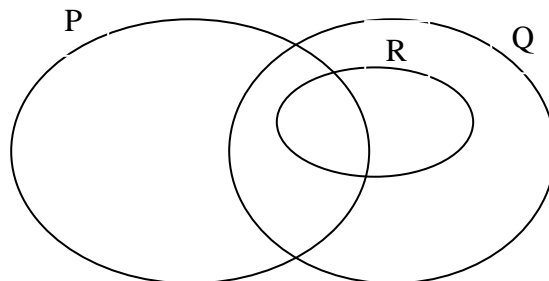
[2 marks]
[2 markah]

Answer / *Jawapan*:

(a)



(b)



2. Calculate the value of x and y that satisfy the following simultaneous linear equations:

Hitungkan nilai x dan y yang memuaskan persamaan linear serentak berikut:

$$\begin{aligned}2x - y &= 8 \\4x + 3y &= 6\end{aligned}$$

[4 marks]
[4 markah]

Answer / Jawapan :

3. Solve the quadratic equation:

Selesaikan persamaan kuadratik:

$$2 + 9v - 2v^2 = 4(1 + v)$$

[4 marks]
[4 markah]

Answer / Jawapan:

4. Diagram 1 shows a solid formed by combining a half cylinder and a right prism. Trapezium $ABGF$ is the uniform cross section of the prism. The height of the solid is 6 cm.

Rajah 1 menunjukkan sebuah pepejal yang terdiri daripada sebuah separuh silinder dan sebuah prisma tegak. Trapezium $ABGF$ ialah keratan rentas seragam prisma itu. Tinggi pepejal itu ialah 6 cm.

Calculate the volume, in cm^3 , of the solid.

Hitung isipadu, dalam cm^3 , pepejal itu

[Use / Guna $\pi = \frac{22}{7}$].

[4 marks]
[4 markah]

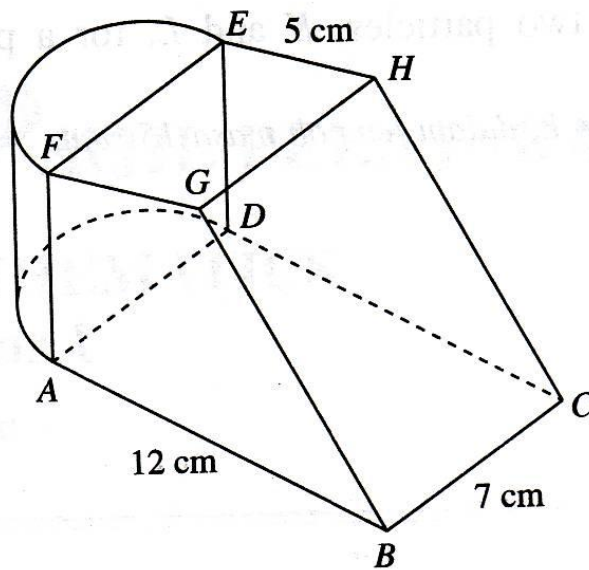


Diagram 1/ Rajah 1

Answer / Jawapan:

- 5 (a) Complete the following statement using the quantifier "all" or "some", to make it a true statement.

“.....quadratic equations have two equal roots.”

Lengkapkan pernyataan berikut dengan menggunakan pengkuantiti "semua" atau "sebilangan", untuk membentuk suatu pernyataan benar.

“.....persamaan kuadrat mempunyai dua punca yang sama.”

- (b) Write down Premise 2 to complete the the following argument:

Tuliskan Premis 2 untuk melengkapkan hujah berikut:

Premise 1: If M is a multiple of 6, then M is a multiple of 3.

Premis 1: Jika M ialah gandaan bagi 6, maka M ialah gandaan bagi 3.

Premise 2/Premis 2:

Conclusion: 23 is not a multiple of 6.

Kesimpulan: 23 bukan gandaan bagi 6.

- (c) Make a general conclusion by induction for the sequence of numbers 7, 14, 27, ... which follows the following pattern.

Buat satu kesimpulan umum secara aruhan bagi urutan nombor 7, 14, 27, ... yang mengikut pola berikut.

$$7 = 3(2)^1 + 1$$

$$14 = 3(2)^2 + 2$$

$$27 = 3(2)^3 + 3$$

$$\dots = \dots$$

- (d) Write down two implications based on the following statement

" $p - q > 0$ if and only if $p > q$."

Tulis dua implikasi berdasarkan pernyataan berikut:

" $p - q > 0$ jika dan hanya jika $p > q$."

[6 marks] / [6 markah]

Answer / Jawapan:

a)

(b) Premise 2 / Premis 2: _____

(c) _____

(d) Implication 1 / Implikasi 1: _____

Implication 2 / Implikasi 2: _____

6. Diagram 2 shows a trapezium ABCD drawn on a Cartesian plane. AB is parallel to CD.
Rajah 2 menunjukkan trapezium ABCD yang dilukis pada satah Cartesian. AB adalah selari dengan CD.

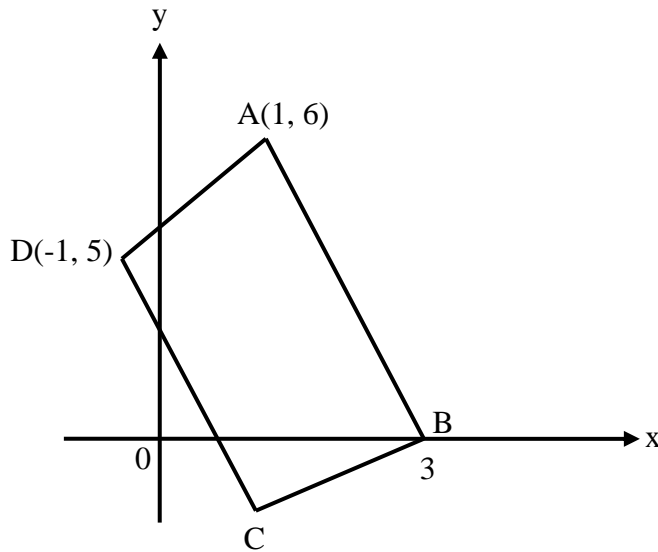


Diagram 2 / Rajah 2

Find
Cari

- (a) the equation of the straight line CD,
persamaan garis lurus CD,
- (b) the x-intercept of the straight line CD.
pintasan-x bagi garis lurus CD.

[5 marks] / [5 markah]

Answer / *Jawapan* :

(a)

(b)

7. Diagram 3 shows three sectors OMN, OPQ and QTO with the same centre O.

Given $OM = 14$ cm and $OT = OP = 7$ cm.

Rajah 3 menunjukkan tiga sektor bulatan OMN, OPQ dan QTO, ketiga-tiganya berpusat O.

Diberi $OM = 14$ cm dan $OT = OP = 7$ cm.

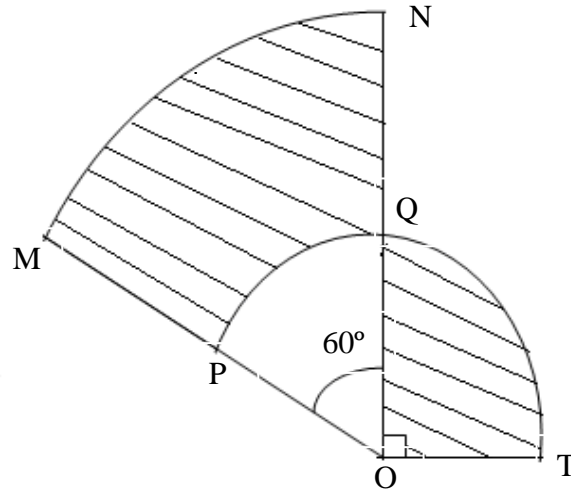


Diagram 3 / Rajah 3

Using $\pi = \frac{22}{7}$, calculate

Dengan menggunakan $\pi = \frac{22}{7}$, hitungkan

- (a) the perimeter of the whole diagram,
perimeter seluruh rajah,
- (b) the area of the shaded region.
luas kawasan yang berlorek.

[6 marks] / [6 markah]

Answer / Jawapan:

(a)

(b)

8. (a) Express 0.0000291 in standard form.

Ungkapkan 0.0000291 dalam bentuk piawai.

[1 mark] / [1markah]

(b) Calculate $8.03 \times 10^4 + 2.45 \times 10^6$ and express the answer as single number.*Hitungkan $8.03 \times 10^4 + 2.45 \times 10^6$ dan ungkapkan jawapan anda sebagai nombor tunggal.*

[2 mark] / [2 markah]

(c) Calculate $\frac{4.86 \times 10^{-2}}{(3 \times 10^{-3})^2}$ and express the answer in standard form.*Hitungkan $\frac{4.86 \times 10^{-2}}{(3 \times 10^{-3})^2}$ dan ungkapkan jawapan anda dalam bentuk piawai.*

[2 marks] [2 markah]

Answer / Jawapan :

(a)

(b)

(c)

9. In diagram 4, JKL is a straight line.
 Dalam rajah 4, JKL ialah garis lurus.

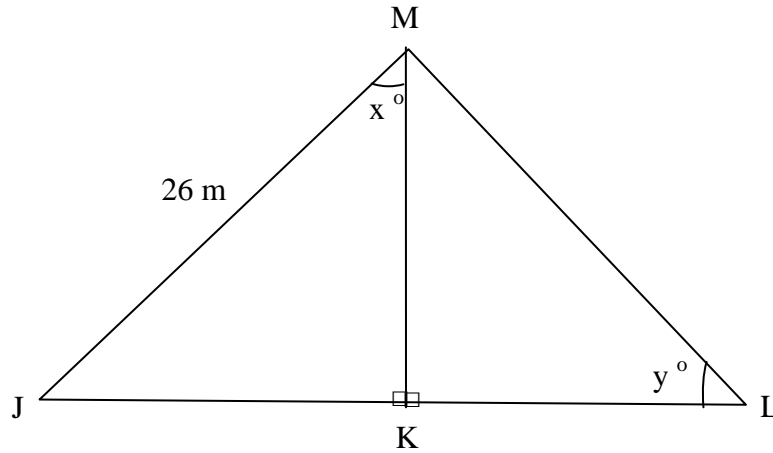


Diagram 4 / Rajah 4

It is given that $\cos x^\circ = \frac{5}{13}$ and $\tan y^\circ = 2$. Calculate the length, in cm ,

Diberi bahawa $\cos x^\circ = \frac{5}{13}$ dan $\tan y^\circ = 2$. Hitungkan panjang, dalam cm,

(a) MK

(b) JKL

[5marks] / [5 markah]

Answer / Jawapan :

(a)

(b)

10. A factory has 30 male workers and 24 female workers.

Sebuah kilang mempunyai seramai 30 orang pekerja lelaki dan 24 orang pekerja perempuan.

- a) A worker is selected at random from the factory, find the probability that a female worker is selected.

Seorang pekerja di pilih secara rawak dari kilang tersebut, cari kebarangkalian seorang pekerja perempuan di pilih.

[2 marks] / [2 markah]

- b) If 6 female workers leave the factory and then a worker is selected at random from the factory, find the probability that a male worker is selected.

Jika 6 orang pekerja perempuan meninggalkan kilang tersebut, kemudian seorang pekerja di pilih secara rawak dari kilang. Cari kebarangkalian seorang pekerja lelaki di pilih.

[3 marks] / [3 markah]

Answer / Jawapan :

(a)

(b)

11.

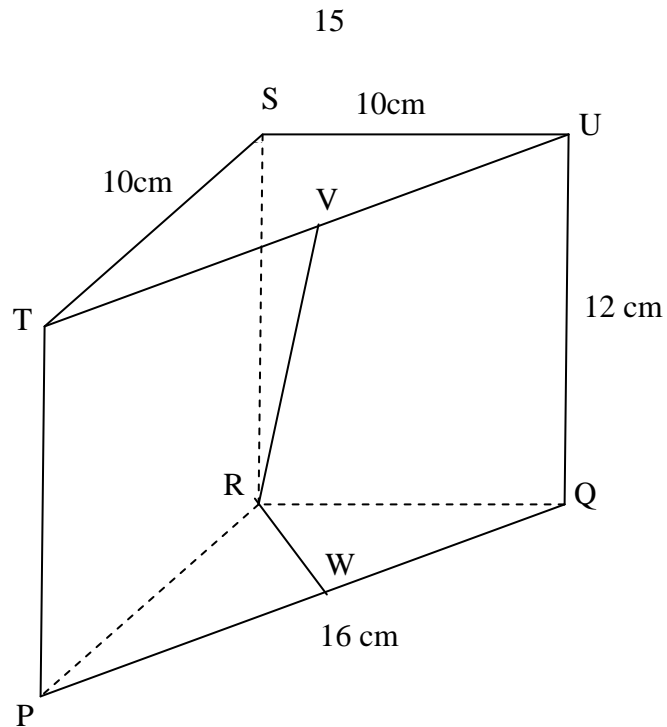


Diagram 5 / Rajah 5

Diagram 5 shows a prism with a horizontal triangular base PQR. V and W are the midpoints of TU and PQ respectively. $PR = RQ = 10$ cm, $PQ = 16$ cm and $QU = 12$ cm.

Rajah 5 menunjukkan sebuah prisma yang mempunyai tapak berbentuk segitiga PQR. V adalah titik tengah bagi TU dan W adalah titik tengah bagi PQ. $PR = RQ = 10$ cm, $PQ = 16$ cm dan $QU = 12$ cm.

- (a) Find the length of RW

Cari panjang RW

[2 marks] / [2 markah]

- (b) Calculate the angle between line RV and the plane PQR.

Kira sudut di antara garisan RV dan satah PQR

[3 marks] / [3 markah]

Answer / Jawapan :

(a)

(b)

Section B
Bahagian B

[48 marks]
[48 markah]

Answer **all** questions in this section.
Jawab semua soalan dalam bahagian ini.

12. The data in Table 1 shows the telephone bill, in RM, paid by 30 families for a certain month.

Data dalam Jadual 1 menunjukkan bil telefon, dalam RM, yang dibayar oleh 30 keluarga untuk suatu bulan tertentu.

80	43	86	64	64	52
55	52	58	95	58	68
63	47	78	37	46	65
45	73	88	32	72	51
95	78	58	41	59	67

Table 1 / *Jadual 1*

(a) Based on the data in Table 1 , complete Table 2 in the answer space .

Berdasarkan data dalam Jadual 1, lengkapkan Jadual 2 di ruang jawapan..

[3 marks] / [3 markah]

(b) Based on Table 2, calculate the estimated mean of the telephone bill paid by a family.

Berdasarkan Jadual 2, hitung min anggaran bil telefon yang dibayar oleh sebuah keluarga.

[3 marks] / [3 markah]

(c) By using a scale of 2 cm to RM10 on the x -axis and 2 cm to 1 families on the y -axis, draw a frequency polygon to represent the data.

Dengan menggunakan skala 2 cm kepada RM10 pada paksi- x dan 2 cm kepada 1 buah keluarga pada paksi- y , bina satu poligon kekerapan bagi data itu.

[5 marks] / [5 markah]

(d) State the number of families who paid the highest bill.

Nyatakan bilangan keluarga yang membayar bil tertinggi.

[1 mark] / [1 markah]

Answer:

Jawapan:

(a)

Class Interval <i>Selang Kelas</i>	Mid-point <i>Titik Tengah</i>	Frequency <i>Kekerapan</i>
30 – 39	34.5	

Table 2 / Jadual 2

(b)

(c) Graph / *Graf*

(d)

13. (a) The Venn diagram in the answer space shows sets E, F and G such that the universal sets, $\xi = E \cup F \cup G$. On that diagrams, shade the set

Gambarajah Venn di ruang jawapan menunjukkan set E, F dan G dengan set semesta, $\xi = E \cup F \cup G$. Pada gambarajah tersebut, lorekkan set

- (i) $E \cap G'$
 (ii) $(F \cap G') \cup E'$

[5 marks] / [5 markah]

- (b) Given that the universal set $\xi = \{ x : 17 \leq x \leq 31, x \text{ is an integer} \}$,

Diberi set semesta $\xi = \{ x : 17 \leq x \leq 31, x \text{ adalah integer} \}$,

Set K = { x : x is a multiple of 5 }

Set K = { x : x adalah gandaan bagi 5 }

Set L = { x : x is a prime number }

Set L = { x : x adalah nombor perdana }

Set M = { x : x is a number greater than 24 }

Set M = { x : x adalah nombor lebih besar daripada 24 }.

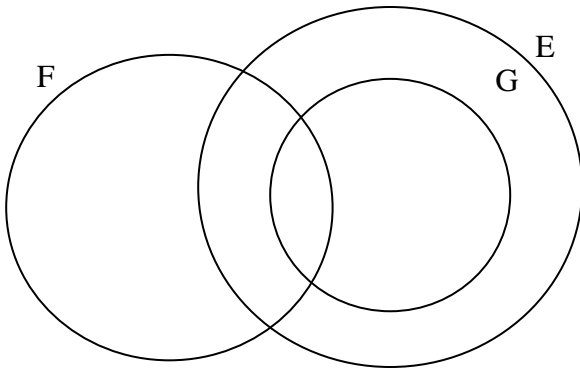
- (i) List the elements of L.
Senaraikan elemen bagi L.
- (ii) Find set $(K \cup L) \cap M'$.
Cari set $(K \cup L) \cap M'$.
- (iii) Find $n(L \cap M)$.
Cari $n(L \cap M)$.

[7 marks] / [7 markah]

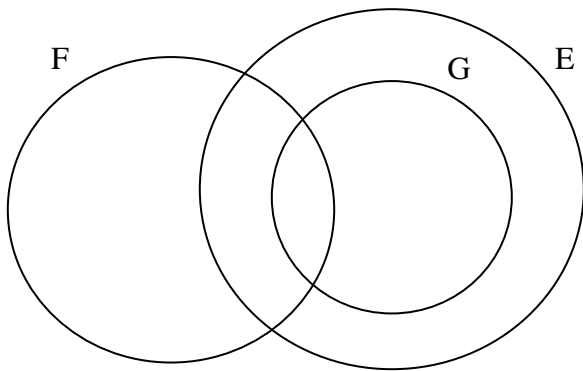
Answer/ Jawapan:

<http://tutormansor.wordpress.com/>

(a) (i)



(ii)



(b) (i)

(ii)

(iii)

14. Table 3 shows the frequency distribution of the mass, in kg, of a group of 80 students.

Jadual 3 menunjukkan taburan kekerapan jisim, dalam kg, bagi sekumpulan 80 orang murid.

Mass (kg) <i>Jisim (kg)</i>	Frequency <i>Kekerapan</i>
30 – 34	5
35 – 39	8
40 – 44	11
45 – 49	21
50 – 54	22
55 – 59	10
60 – 64	3

Table 3 / *Jadual 3*

- (a) (i) State a modal class.
Nyatakan kelas mod
- (ii) Calculate the estimated mean of the mass of the group of students.
Hitungkan min anggaran jisim bagi kumpulan murid itu .
- [4 marks] / [4 markah]

- (b) Based on Table 3, complete Table 4 in the answer space to show the cumulative frequency distribution of the masses.
Berdasarkan Jadual 3, lengkapkan Jadual 4 di ruang jawapan untuk menunjukkan kekerapan longgokan jisim itu
- [3 marks] / [3 markah]

- (c) *For this part of the question, use the graph paper provided .*
By using the scale of 2 cm to 5 kg on the horizontal axis and 2 cm to 10 students on the vertical axis, draw an ogive for the data.

Untuk ceraiian soalan ini, gunakan kertas graf yang disediakan.

Dengan menggunakan skala 2cm kepada 5 kg pada paksi mengufuk dan 2 cm kepada 10 orang murid pada paksi mencancang, lukiskan satu ogif bagi data tersebut.

[4 marks] / [4 markah]

- (d) 25% of all the students in the group have a mass of less than p kg. These students will be supplied with nutritional food. Using the ogive you had drawn in 14 (c), find the value of p .

25 % daripada murid-murid dalam kumpulan tersebut mempunyai jisim kurang daripada p kg . Murid-murid ini akan dibekalkan dengan makanan berkhasiat. Dengan menggunakan ogif yang telah anda lukis di 14 (c), cari nilai bagi p

[1 mark] / [1 markah]

Answer / Jawapan :

(a) (i)

(ii)

(b)

Upper Boundary <i>Sempadan Atas</i>	Cumulative frequency <i>Kekerapan Longgokan</i>
29.5	0
34.5	

Table 4 / *Jadual 4*

(c) Graph / *Graf*

(d)

15 (a)

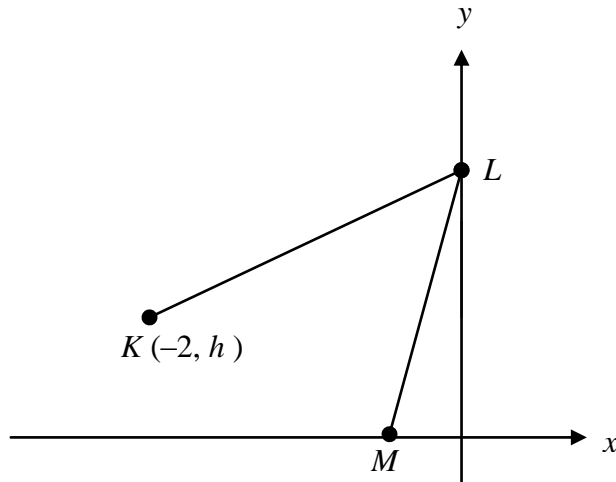


Diagram 6 / Rajah 6

In Diagram 6, the equation of line LM is $y - 6x = 6$ and the gradient of line KL is 2, find

Dalam Rajah 6, persamaan bagi LM ialah $y - 6x = 6$ dan kecerunan garis lurus KL ialah 2, cari

- (i) the coordinates of L
koordinat bagi titik L
- (ii) the value of h ,
nilai bagi h
- (iii) the gradient of line KM and hence the equation of line KM .
carikan kecerunan bagi garis KM dan seterusnya, nyatakan persamaan bagi garis KM

[6 marks] / [6 markah]

- 15 (b) A box contains 40 chalks consisting of white chalk and red chalk.
Sebuah kotak mengandungi 40 batang kapur yang terdiri dari kapur putih dan kapur merah.
- (i) A chalk is drawn at random from the box. The probability of getting a white chalk is $\frac{3}{8}$. Find the number of red chalks in the box.

Sebatang kapur dikeluarkan secara rawak dari kotak itu. Kebarangkalian untuk mendapat kapur berwarna putih ialah $\frac{3}{8}$. Cari bilangan kapur yang berwarna merah dalam kotak.

Another 5 red chalks and 3 green chalks are put inside the box.

Sebanyak 5 batang kapur merah yang lain dan 3 batang kapur hijau dimasukkan ke dalam kotak tadi.

- (ii) If a chalk is drawn at random from the box, state the probability of drawing a red chalk.
Jika sebatang kapur dikeluarkan secara rawak dari kotak itu, nyatakan kebarangkalian mengeluarkan kapur berwarna merah.

All the white chalks are now taken out from the box.

Semua kapur berwarna putih dikeluarkan dari kotak itu sekarang.

- (iii) If a chalk is drawn at random from the box, state the probability of drawing a green chalk.
Jika sebatang kapur dikeluarkan secara rawak dari kotak itu, nyatakan kebarangkalian mengeluarkan kapur berwarna hijau.

[6 marks] / [6 markah]

Answer / Jawapan :

(a) (i)

(ii)

(iii)

(b) (i)

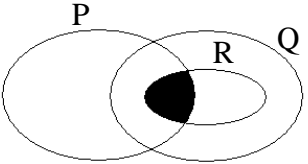
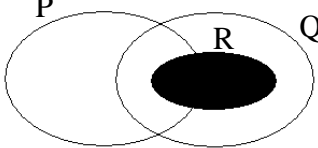
(ii)

(iii)

END OF QUESTION PAPER / KERTAS SOALAN TAMAT

<http://tutormansor.wordpress.com/>

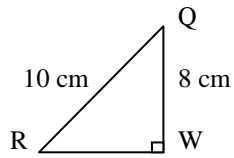
**PEJABAT PELAJARAN DAERAH SEGAMAT
PEPERIKSAAN AKHIR TAHUN SETARA 2009
SKEMA PEMARKAHAN
MATEMATIK TINGKATAN 4 KERTAS 2**

No	Solutions	Marks
1a)		1 mark
1b)	 <p>Note : Give 1 mark for $P' \cap Q$ correctly shaded</p>	2 marks
2.	$2x - y = 8 \quad \dots\dots\dots (i)$ $4x + 3y = 6 \quad \dots\dots\dots (ii)$ <p>Equation (i) $\times 2$</p> $4x - 2y = 16 \quad \dots\dots\dots (iii) \text{ or equivalent } \dots\dots\dots$ <p>Equation (ii) – Equation (iii)</p> $3y - (-2y) = 6 - 16$ $3y + 2y = -10$ $5y = -10 \quad \dots\dots\dots$ $y = -2 \quad \dots\dots\dots$ <p>Substitute $y = -2$ into equation (i)</p> $2x - (-2) = 8$ $2x + 2 = 8$ $2x = 8 - 2$ $2x = 6$ $x = 3 \quad \dots\dots\dots$	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p>
3.	$2y^2 - 5y + 2 = 0$ $(2y - 1)(y - 2) = 0$ $y = \frac{1}{2} \quad \text{or} \quad 0.5$ $y = 2$	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p>
4.	$\left[\frac{1}{2} \times \frac{22}{7} \times \left(\frac{7}{2}\right)^2 \times 6 \right] + \left[\frac{1}{2} (5 + 12) \times 6 \times 7 \right] \quad (\text{semi cylinder, prism})$ $115.5 + 357 \quad (\text{addition})$ 472.5	<p>1mark ,1mark</p> <p>1 mark</p> <p>1 mark</p>

5.	a) Some b) 23 is not a multiple of 3. c) $3(2)^n + n$, $n = 1, 2, 3, \dots$ d) If $p - q > 0$, then $p > q$. If $p > q$, then $p - q > 0$.	1 mark 1 mark 1 mark, 1 mark 1 mark 1 mark
6	a) $m_{AB} = \frac{6-0}{1-3}$ $= \frac{6}{-2}$ $= -3$ $y = mx + c$, $(-1, 5)$, $m = -3$ $5 = -3(-1) + c$ $c = 2$ Equation of the straight line of CD: $y = -3x + 2$ b) $0 = -3x + 2$ $x = \frac{2}{3}$	1 mark 1 mark 1 mark 1 mark 1 mark
7 (a)	Length of arc MN = $\frac{60}{360} \times 2 \times \frac{22}{7} \times 14 = 14.67$ cm Or Length of arc QT = $\frac{90}{360} \times 2 \times \frac{22}{7} \times 7 = 11$ cm Perimeter = $14.67 + 11 + 14 + 7 + 7$ (add) $= 53.67$ cm	1 mark 1 mark 1 mark
7 (b)	Area of sector QOT = $\frac{90}{360} \times \frac{22}{7} \times 7^2 = 38.5$ cm ² Or Area of sector OMN = $\frac{60}{360} \times \frac{22}{7} \times 14^2 = 102.67$ cm ² Or Area of sector OPQ = $\frac{60}{360} \times \frac{22}{7} \times 7^2 = 25.67$ cm ² Area of shaded region = $38.5 + (102.67 - 25.67)$ (add and minus) $= 115.5$ cm ²	1 mark 1 mark 1 mark 1 mark

8 (a)	2.91×10^{-5}	1 mark
8 (b)	2.5303×10^6	2 marks
8 (c)	5.4×10^3	2 marks
9.(a)	$\cos x^\circ = \frac{5}{13} = \frac{MK}{26}$ MK = 10 cm	1 mark 1 mark
9 (b)	$\tan y^\circ = 2 = \frac{MK}{KL}$ KL = MK / 2 = 10/2 = 5 cm $JK = \sqrt{676 - 100}$ = 24 cm JKL = 5 + 24 = 29 cm	1 mark 1 mark 1 mark
10 (a)	$P(f) = \frac{n(f)}{n(S)}$ $= \frac{24}{54}$ $= \frac{4}{9}$	2 mark
10 (b)	$n(f) = 24 - 6 = 18$ $n(m) = 30$ $n(S) = 48$ $P(m) = \frac{30}{48}$ $= \frac{5}{8}$	1 mark 2 marks

11(a)



W is a midpoint of PQ

$RW^2 = 10^2 - 8^2$

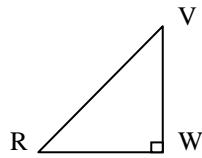
$= 36$

$RW = 6$

1 mark

1 mark

11(b)



$\angle VRW$

1 mark

$\tan \angle VRW = \frac{12}{6}$

$= 2$

1 mark

$\angle VRW = \tan^{-1} 2$

$= 63^\circ 26'$

1 mark

12(a)

Class Interval <i>Selang Kelas</i>	Mid-point <i>Titik Tengah</i>	Frequency <i>Kekerapan</i>
30 – 39	34.5	2
40 – 49	44.5	5
50 – 59	54.5	8
60 – 69	64.5	6
70 – 79	74.5	4
80 – 89	84.5	3
90 – 99	94.5	2

Class interval

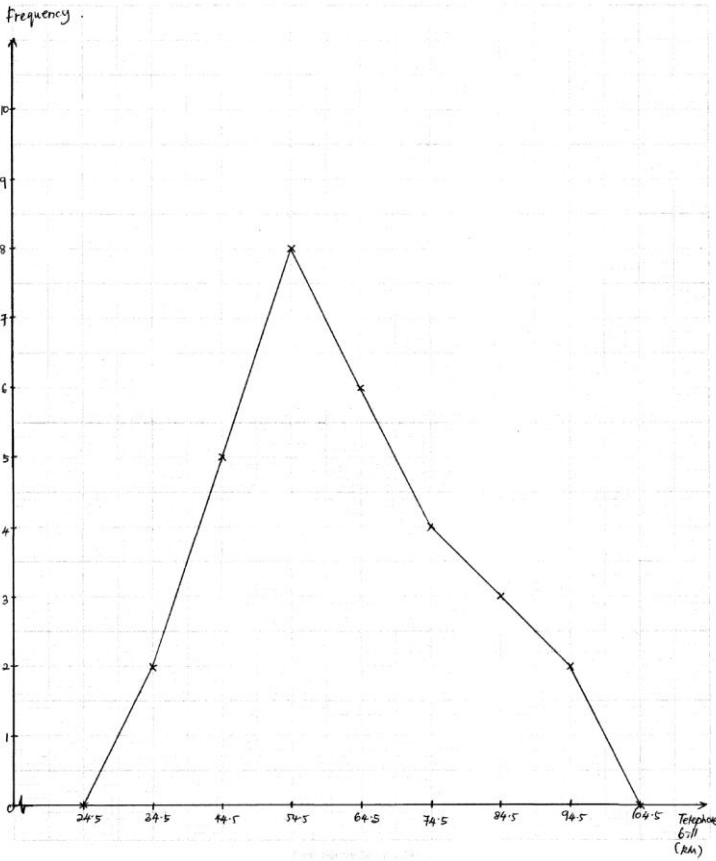
1 mark

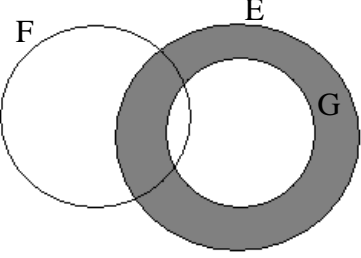
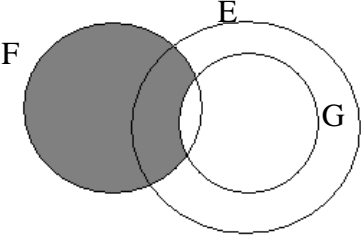
Mid-point

1 mark

Frequency

1 mark

12 (b)	$\frac{(34.5 \times 2) + (44.5 \times 5) + (54.5 \times 8) + (64.5 \times 6) + (74.5 \times 4) + (84.5 \times 3) + (94.5 \times 2)}{30}$ RM 61.83	2 marks 1 mark
12 (c)	 <p>Uniform & correct scale 1 mark</p> <p>All points correct (9 points including frequency 0) 2 marks</p> <p>Frequency polygon is correct (all points are connected by straight lines) 2 marks</p>	1 mark 2 marks 2 marks
12(d)	2 families	1 mark

<p>13 (a)</p> <p>(i)</p> <p>ii)</p>	 <p>Note : Give 1 mark for G' correctly shaded</p>  <p>Note : Give 1 mark for G' or E' correctly shaded. Give 2 marks for $(F \cap G')$ correctly shaded.</p>	<p>2 marks</p> <p>3 marks</p>
<p>13 (b)</p> <p>(i)</p> <p>(ii)</p> <p>iii)</p>	<p>{17, 19, 23, 29, 31}</p> <p>{17, 19, 20, 23}</p> <p>Note : $(K \cup L) = \{17, 19, 20, 23, 25, 29, 30\}$ give 2 marks</p> <p>2</p> <p>Note : {29, 31} give 1 mark</p>	<p>2 marks</p> <p>3 marks</p> <p>2 marks</p>
<p>14(a)</p> <p>(i)</p>	<p>50 – 54</p>	<p>1 mark</p>
<p>(ii)</p>	$\text{mean} = \frac{32(5) + 37(8) + 42(11) + 47(21) + 52(22) + 57(10) + 62(3)}{80}$ $= \frac{3805}{80}$ $= 47.56$	<p>2 marks</p> <p>1 mark</p>

14(b)

Upper boundary	Cumulative frequency
29.5	0
34.5	5
39.5	13
44.5	24
49.5	45
54.5	67
59.5	77
64.5	80

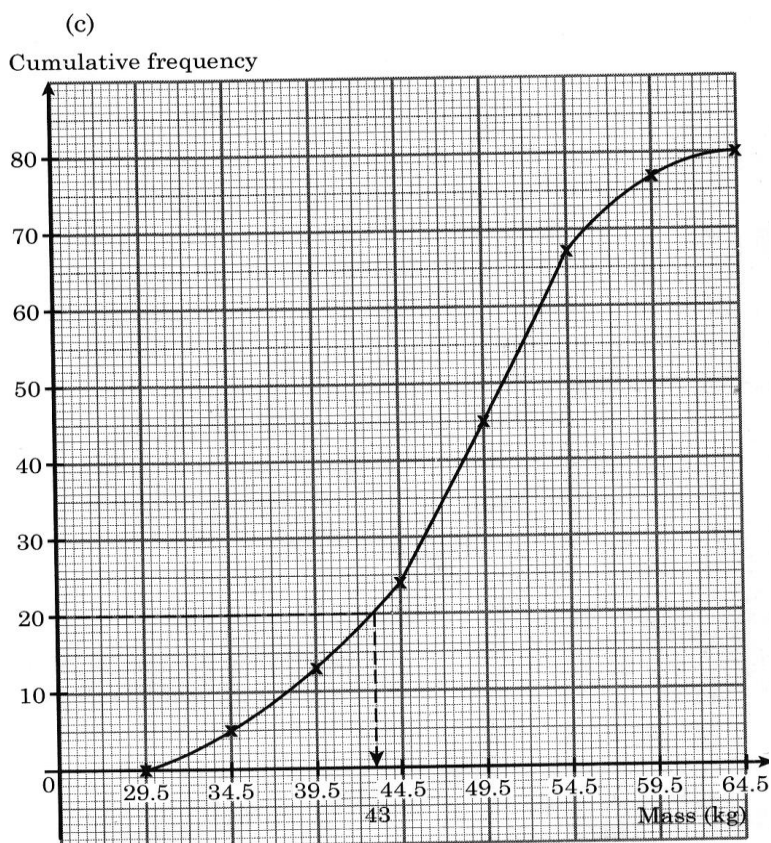
Upper boundary

1 mark

Cumulative frequency

2 marks

14(c)



Uniform & correct scale

1 mark

All points correct (8 points including frequency 0)

2 marks

Curve is smooth

1 mark

14(d)

$$\frac{25}{100} \times 80 = 20$$

from the ogive, $p = 43$

1 mark

<p>15(a)</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p>	<p>$L(0, 6)$</p> <p>$\frac{h-6}{-2-0} = 2$</p> <p>$h = 2$</p> <p>$M(-1, 0)$</p> <p>$m_{km} = \frac{2-0}{-2-(-1)}$</p> <p>$m = -2$</p> <p>$0 = -2(-1) + c$ or $2 = -2(-2) + c$</p> <p>$c = -2$</p> <p>$y = -2x - 2$</p>	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p>
<p>15(b)</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p>	<p>$\frac{5}{8} \times 40$</p> <p>$= 25$</p> <p>$n(S) = 48$</p> <p>$p(\text{Red}) = \frac{20}{48}$</p> <p>$= \frac{5}{12}$</p> <p>$n(S) = 33$</p> <p>$p(\text{Green}) = \frac{3}{33}$</p> <p>$= \frac{1}{11}$</p>	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p>