

**SULIT**

**1449/2**

**1449/2**  
**Mathematics**  
**Paper 2**  
**Oct./Nov.**  
**2010**  
 $2\frac{1}{2}$  hours

Name : .....

Form : .....



**JABATAN PELAJARAN MELAKA**

**PEPERIKSAAN SELARAS AKHIR TAHUN**  
**TINGKATAN 4, 2010**

**MATHEMATICS**

Paper 2

Two hours and thirty minutes

**DO NOT OPEN THIS QUESTION PAPER UNTIL YOU**  
**ARE TOLD TO DO SO**  
**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

1. This question paper consists of two sections : **Section A** and **Section B**.
2. Answer **all** questions in **Section A** and **Section B**.
3. Write your answers in the spaces provided in the question paper.
4. Show your working. It may help you to get marks.
5. The diagrams in the questions provided are not drawn to scale unless stated.
6. The marks allocated for each question are shown in brackets.
7. A list of formulae is provided on pages 2 to 3.
8. You may use a non-programmable scientific calculator.
9. Hand in this question paper to the invigilator at the end of the examination.

Section	Question	Full Marks	Marks Obtained
<b>A</b>	1	3	
	2	4	
	3	4	
	4	5	
	5	5	
	6	4	
	7	7	
	8	6	
	9	4	
	10	4	
	11	6	
<b>B</b>	12	12	
	13	12	
	14	12	
	15	12	
Total			

**This question paper consists of 27 printed pages**

## MATHEMATICAL FORMULAE

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

## RELATIONS

$$1 \quad a^m \times a^n = a^{m+n}$$

$$2 \quad a^m \div a^n = a^{m-n}$$

$$3 \quad (a^m)^n = a^{mn}$$

$$4 \quad A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$$

$$5 \quad P(A) = \frac{n(A)}{n(S)}$$

$$6 \quad P(A') = 1 - P(A)$$

$$7 \quad \text{Distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$8 \quad \text{Midpoint } (x, y) = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$9 \quad \text{Average speed} = \frac{\text{distance travelled}}{\text{time taken}}$$

$$10 \quad \text{Mean} = \frac{\text{sum of data}}{\text{number of data}}$$

$$11 \quad \text{Mean} = \frac{\text{sum of(class mark} \times \text{frequency)}}{\text{sum of frequencies}}$$

$$12 \quad \text{Pythagoras Theorem} \\ c^2 = a^2 + b^2$$

$$13 \quad m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$14 \quad m = - \frac{y - \text{int except}}{x - \text{int except}}$$

## SHAPES AND SPACE

1 Area of trapezium =  $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$

2 Circumference of circle =  $\pi d = 2\pi r$

3 Area of circle =  $\pi r^2$

4 Curved surface area of cylinder =  $2\pi r h$

5 Surface area of sphere =  $4\pi r^2$

6 Volume of right prism = cross sectional area  $\times$  length

7 Volume of cylinder =  $\pi r^2 h$

8 Volume of cone =  $\frac{1}{3} \pi r^2 h$

9 Volume of sphere =  $\frac{4}{3} \pi r^3$

10 Volume of right pyramid =  $\frac{1}{3} \times \text{base area} \times \text{height}$

11 Sum of interior angles of a polygon =  $(n - 2) \times 180^\circ$

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

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

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

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

**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 set,  $\xi = P \cup Q \cup R$ .

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

On the diagrams in the answer space, shade the set

*Pada rajah di ruang jawapan, lorekkan set*

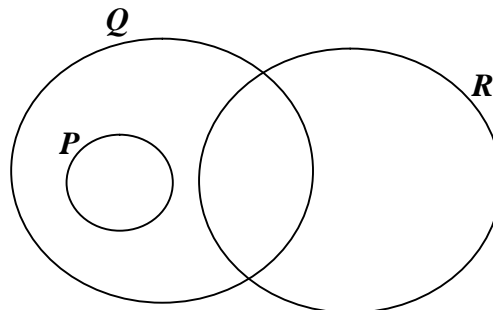
- (a)  $P \cup Q$ ,  
(b)  $(P \cup R)' \cap Q$ .

[3 marks]

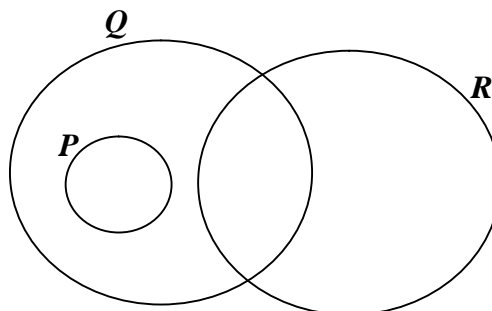
[3 markah]

Answer / *Jawapan* :

(a)



(b)



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

*Hitung nilai  $x$  dan nilai  $y$  yang memuaskan persamaan linear serentak berikut :*

$$2x - 4y = 8$$

$$4x - 5y = 13$$

[4 marks]

[4 markah]

Answer / Jawapan :

- 3 Diagram 1 shows a right prism with  $PQR$  as its uniform cross section.  $QRTU$  is a rectangular base.  $M$  and  $N$  are the midpoints of the sides  $SP$  and  $TR$  respectively.

Rajah 1 menunjukkan sebuah prisma tegak dengan  $PQR$  sebagai keratan rentas seragam prisma itu.  $QRTU$  ialah tapak berbentuk segiempat tepat.  $M$  ialah titik tengah  $SP$  dan  $N$  ialah titik tengah  $TR$ .

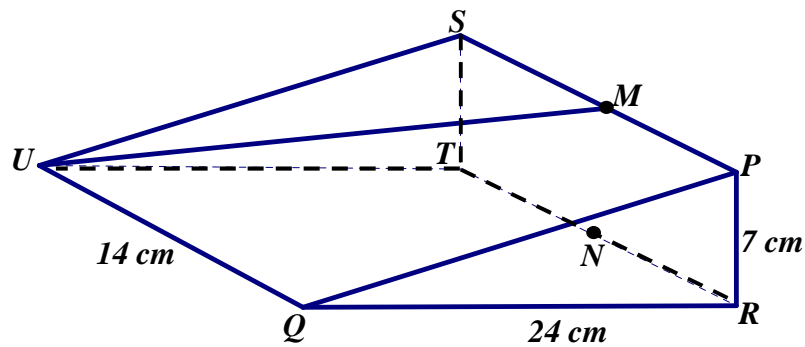


Diagram 1  
Rajah 1

Identify and calculate the angle between the line  $UM$  and the plane  $QRTU$ .

Kenal pasti dan hitung sudut di antara garis  $UM$  dengan satah  $QRTU$ .

[4 marks]  
[4 markah]

Answer / Jawapan :

- 4 (a) State whether the following compound statement is true or false.

*Nyatakan sama ada pernyataan berikut adalah benar atau palsu.*

$4^3 = 64 \text{ and } -1 < -2$ $4^3 = 64 \text{ dan } -1 < -2$
---

- (b) Write down **two** implications based on the following compound statement:

*Tulis dua implikasi berdasarkan pernyataan berikut:*

$x^5 = -32 \text{ if and only if } x = -2.$ $x^5 = -32 \text{ jika dan hanya jika } x = -2.$
--

- (c) It is given that the exterior angle of a regular polygon of  $n$  sides is  $\frac{360^\circ}{n}$

Make **one** conclusion by deduction on the size of the exterior angle of a regular octagon.

*Diberi bahawa sudut peluaran sebuah poligon sekata dengan  $n$  sisi ialah  $\frac{360^\circ}{n}$ .*

*Buat satu kesimpulan secara deduksi tentang saiz sudut peluaran sebuah oktagon sekata.*

[5 marks]  
[5 markah]

Answer / Jawapan :

(a) .....

(b) Implication 1 / Implikasi 1:

.....  
.....

Implication 2 / Implikasi 2:

.....  
.....

(c) .....

- 5 (a) Complete the following statement using “and” or “or” to make it a true statement.

*Lengkapkan pernyataan berikut dengan menggunakan “dan” atau “atau”, untuk membentuk suatu pernyataan benar.*

‘3 is a multiple of 6 \_\_\_\_\_  $x + 3x = 4x$ ’  
 ‘3 ialah gandaan 6 \_\_\_\_\_  $x + 3x = 4x$ ’

- (b) Complete the following statement using the quantifier “all” or “some” to make it a false statement.

*Lengkapkan pernyataan berikut dengan menggunakan pengkuantiti “semua” atau “sebilangan”, untuk membentuk suatu pernyataan palsu.*

‘\_\_\_\_\_ pentagons have 5 sides.’  
 ‘\_\_\_\_\_ pentagon mempunyai 5 sisi.’

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

*Tuliskan Premis 2 untuk melengkapkan hujah berikut:*

Premise 1: If  $x$  is greater than zero, then  $x$  is a positive number.

Premise 2: .....

Conclusion: 5 is a positive number.

*Premis 1: Jika  $x$  lebih besar daripada sifar, maka  $x$  ialah nombor positif.*

*Premis 2: .....*

*Kesimpulan: 5 ialah nombor positif.*

- (d) Make a general conclusion by induction for the sequence of numbers 2, 7, 20, ... which follow the following pattern.

*Buat satu kesimpulan umum secara aruhan bagi urutan nombor 2, 7, 20, ... yang mengikut pola berikut.*

$$2 = 2(3)^0$$

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

$$20 = 2 + 2(3)^2$$

$$.... = ...$$

[5 marks]  
[5 markah]



Answer / Jawapan :

(a) .....

(b) .....

(c) Premise 2/ Premis 2:

.....

(d) .....

.....

---

6 Solve the following quadratic equation.

*Selesaikan persamaan kuadratik yang berikut.*

$$8x = x(x + 5)$$

[4 marks]

[4 markah]

Answer / Jawapan :

- 7 In Diagram 2,  $OPQR$  is a trapezium.  
*Dalam rajah 2,  $OPQR$  ialah sebuah trapezium.*

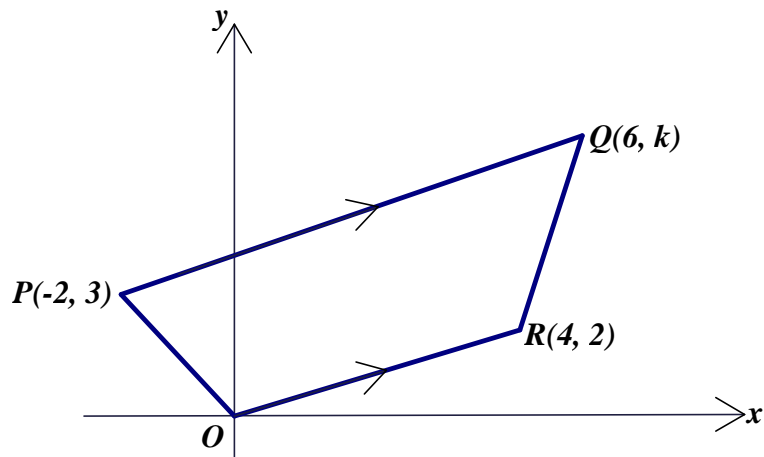


Diagram 2  
*Rajah 2*

Find

*Cari*

- (a) The value of  $k$ ,  
*Nilai  $k$ ,*
- (b) The equation of the line  $PQ$ ,  
*Persamaan garis lurus  $PQ$ ,*
- (c) The  $x$ -intercept of the line  $PQ$ .  
*Pintasan- $x$  bagi garis lurus  $PQ$ .*

[7 marks]  
[7 markah]

Answer / *Jawapan* :

- (a)
- (b)
- (c)

- 8 Diagram 3 shows a circle  $QRST$  with centre  $O$ . The tangent  $PQ$  touches the circle at  $Q$ .

Rajah 3 menunjukkan sebuah bulatan  $QRST$  dengan pusat  $O$ . Tangen  $PQ$  menyentuh bulatan pada  $Q$ .

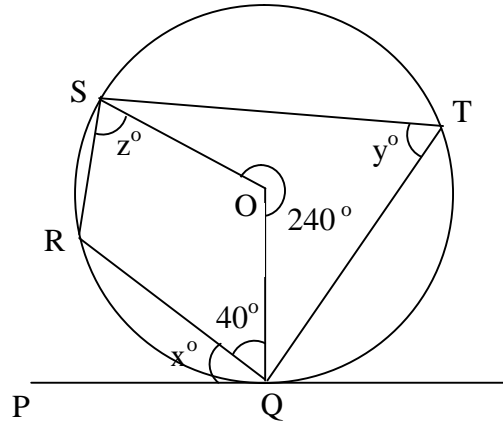


Diagram 3  
Rajah 3

Calculate the value of

Hitungkan nilai

- (a)  $x$
- (b)  $y$
- (c)  $z$

[6 marks]  
[6 markah]

Answer / Jawapan :

- (a)
  
  
  
  
  
  
  
  
  
  
- (b)
  
  
  
  
  
  
  
  
  
  
- (c)

- 9 Diagram 4 shows a solid right prism  $ABCDEF$  with right-angled triangle  $ABC$  as its cross-section. A solid cylinder with diameter 4 cm is taken out from the prism.

Rajah 4 menunjukkan sebuah pepejal berbentuk prisma tegak  $ABCDEF$  dengan segitiga bersudut tegak  $ABC$  sebagai keratan rentas seragamnya. Sebuah pepejal berbentuk silinder dengan diameter 4 cm dikeluarkan daripada prisma itu.

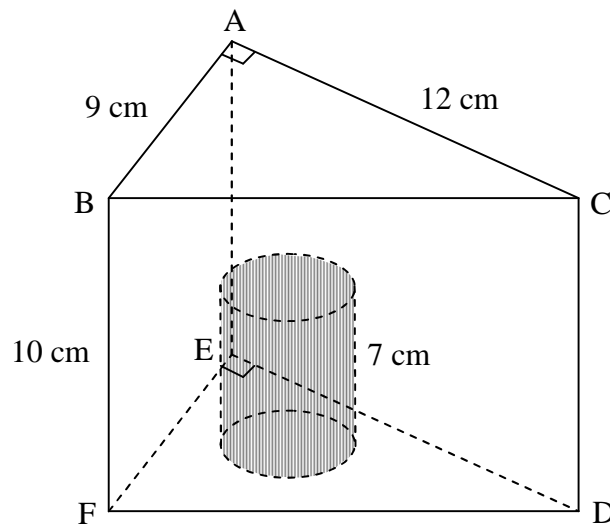


Diagram 4  
Rajah 4

Using  $\pi = \frac{22}{7}$ , calculate the volume, in  $\text{cm}^3$ , of the remaining solid.

Gunakan  $\pi = \frac{22}{7}$ , kirakan isipadu, dalam  $\text{cm}^3$ , pepejal yang tinggal.

[4 marks]  
[4 markah]

Answer / Jawapan :

- 10 There are 72 red and blue chairs in a class. If a chair is selected at random from the class the probability of selecting a blue chair is  $\frac{2}{3}$ .

*Terdapat 72 kerusi berwarna merah dan biru di dalam sebuah kelas. Jika sebuah kerusi dipilih secara rawak dari kelas itu, kebarangkalian kerusi biru terpilih ialah  $\frac{2}{3}$ .*

- (a) Find the number of blue chairs in the class.  
*Cari bilangan kerusi biru di dalam kelas itu.*
- (b) If 4 red chairs and 2 blue chairs are taken out from the class, find the probability that a chair selected at random is a red chair.  
*Jika 4 buah kerusi merah dan 2 buah kerusi biru dikeluarkan dari kelas itu, cari kebarangkalian kerusi yang dipilih secara rawak itu adalah sebuah kerusi merah.*

[4 marks]  
[4 markah]

Answer / Jawapan :

(a)

(b)

- 11 Diagram 5 shows two sectors,  $ORQ$  and  $OPS$  with centre  $O$ .

*Rajah 5 menunjukkan dua sektor,  $ORQ$  dan  $OPS$  dengan pusat  $O$ .*

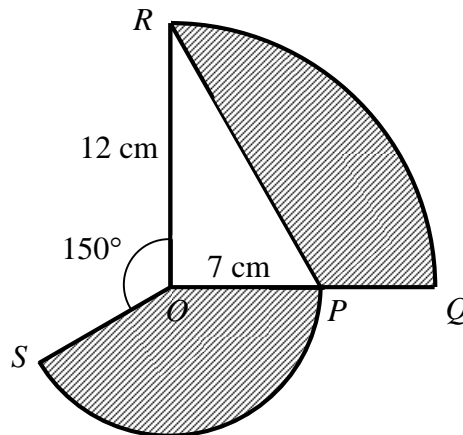


Diagram 5  
*Rajah 5*

By using  $\pi = \frac{22}{7}$ , calculate

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

- (a) The perimeter, in cm, of the whole diagram.

*Perimeter seluruh rajah dalam cm,*

- (b) The area, in  $\text{cm}^2$ , of the shaded region.

*Luas kawasan berlorek, dalam  $\text{cm}^2$ .*

[6 marks]  
[6 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 Table 1 shows the mass distribution, in g, of 200 potatoes that were produced by a farm.

*Jadual 1 menunjukkan taburan jisim, dalam g, bagi 200 biji kentang yang dihasilkan oleh sebuah ladang.*

Mass (g) <i>Jisim (g)</i>	Frequency <i>Kekerapan</i>
40 – 44	12
45 – 49	20
50 – 54	32
55 – 59	48
60 – 64	44
65 – 69	26
70 – 74	14
75 – 79	4

Table 1  
*Jadual 1*

- (a) State the midpoint of the modal class.

*Nyatakan titik tengah bagi kelas mod*

[2 marks]  
[2 markah]

- (b) Based on the data in Table 1, complete Table 2.

*Berdasarkan data di Jadual 1, lengkapkan Jadual 2.*

[3 marks]  
[3 markah]

- (c) For this part of the question, use the graph paper provided on page 18.

*Untuk ceriaan soalan ini, guna kertas graf yang disediakan pada halaman 18.*

Using the scale of 2 cm to 5 g on the horizontal axis and 2 cm to 20 potatoes on the vertical axis, draw an ogive for the data.

*Dengan menggunakan skala 2 cm kepada 5 g pada paksi mengufiuk dan 2 cm kepada 20 biji kentang pada paksi mencancang, lukis satu ogif bagi data tersebut.*

[4 marks]

[4 markah]

- (d) Based on the ogive in (c), find

*Berdasarkan ogif di (c), cari*

- (i) the number of potatoes with mass less than 66 g,  
*bilangan kentang yang mempunyai jisim kurang daripada 66 g,*
- (ii) the inter-quartile range.  
*julat antara kuartil.*

[3 marks]

[3 markah]



Answer / Jawapan :

(a) Midpoint / Titik tengah = .....

(b)

Mass (g) <i>Jisim (g)</i>	Frequency <i>Kekerapan</i>	Upper Boundary <i>Sempadan atas</i>	Cumulative Frequency <i>Kekerapan longgokan</i>
40 – 44	12		
45 – 49	20		
50 – 54	32		
55 – 59	48		
60 – 64	44		
65 – 69	26		
70 – 74	14		
75 – 79	4		

Table 2  
*Jadual 2*

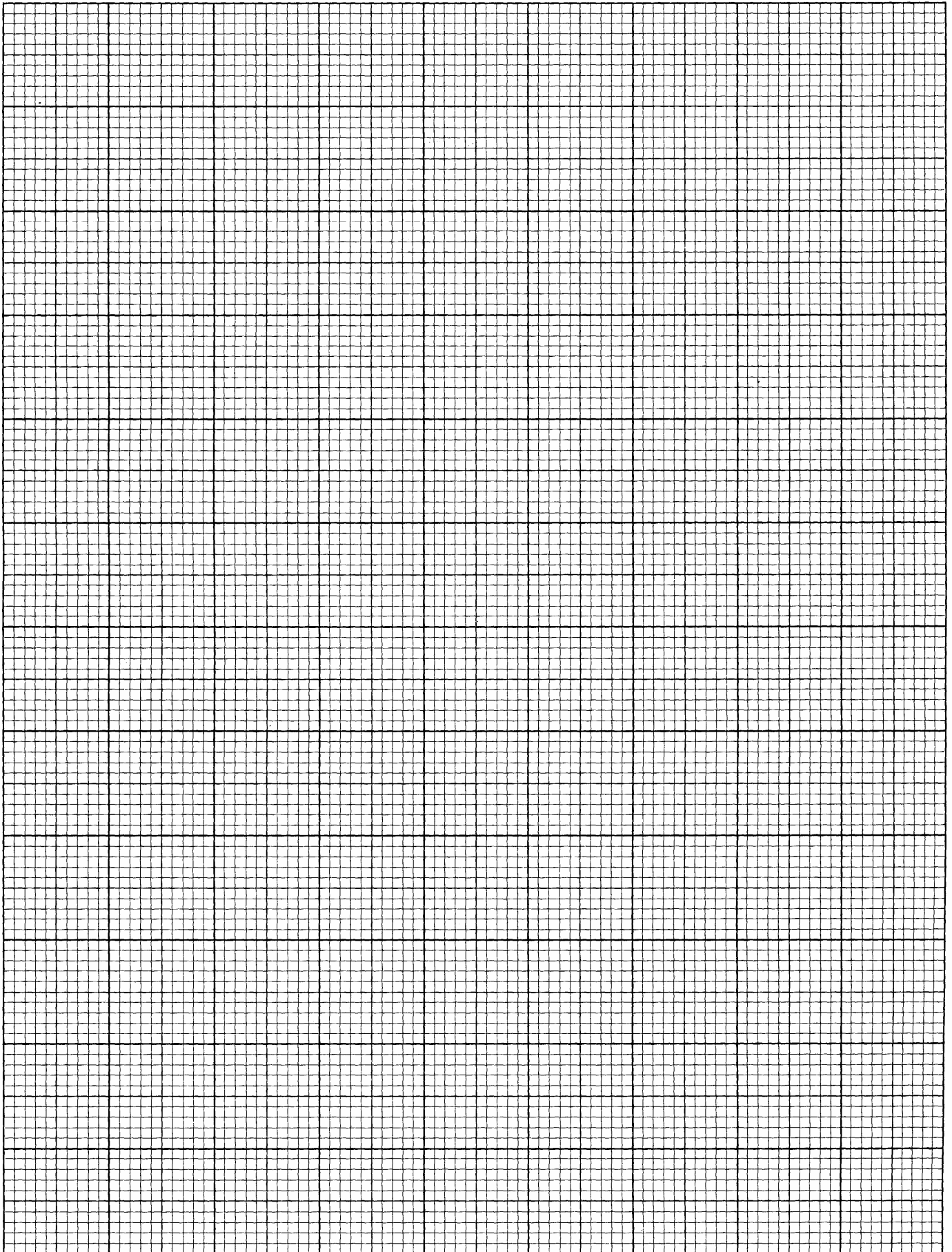
(c) Refer graph on page 18.

*Rujuk graf pada halaman 18.*

(d) (i) Number of potatoes / *Bilangan kentang*  
= .....

(ii) Inter-quartile range / *Julat antara kuartil*  
= .....

**Graph for Question 12/ Graf untuk Soalan 12**



- 13 The data in Diagram 6 shows the mass, in kg, of a group of 50 students.

*Data di dalam Rajah 6 menunjukkan jisim, dalam kg, satu kumpulan 50 pelajar.*

54	46	40	53	47	56	52	57	51	52
51	50	54	43	55	49	58	53	47	58
59	52	46	57	54	58	44	68	56	57
44	45	50	52	48	53	62	51	59	54
63	53	59	60	42	66	52	59	64	72

Diagram 6  
*Rajah 6*

- (a) Based on the data in Diagram 6 and by using a class interval of 5, complete Table 3 in the answer space.

*Berdasarkan data dalam Rajah 6 dan dengan menggunakan selang kelas 5, lengkapkan Jadual 3 di ruang jawapan.*

[4 marks]  
[4 markah]

- (b) Based on Table 3 in (a), calculate the estimated mean of the mass of the students.

*Berdasarkan pada Jadual 3 dalam (a), kirakan anggaran min jisim bagi pelajar.*

[3 marks]  
[3 markah]

- (c) For this part of the question, use the graph paper on page 21.

*Untuk ceraiian soalan ini, gunakan kertas graf yang disediakan*

By using a scale of 2 cm to 5 kg on the  $x$ -axis and 2 cm to 2 students on the  $y$ -axis, draw a frequency polygon for the data.

*Dengan menggunakan skala 2 cm kepada 5 kg pada paksi- $x$  dan 2 cm kepada 2 pelajar pada paksi- $y$ , lukis satu poligon kekerapan bagi data tersebut.*

[4 marks]  
[4 markah]

- (d) State **one information** from the frequency polygon in (c).

*Nyatakan **satu maklumat** daripada poligon kekerapan di (c).*

[1 marks]  
[1 markah]

Answer / Jawapan :

(a)

Mass (kg) <i>Jisim (kg)</i>	Frequency <i>Kekerapan</i>	Midpoint <i>Titik Tengah</i>
35 – 39		
40 – 44		

Table 3  
*Jadual 3*

(b)

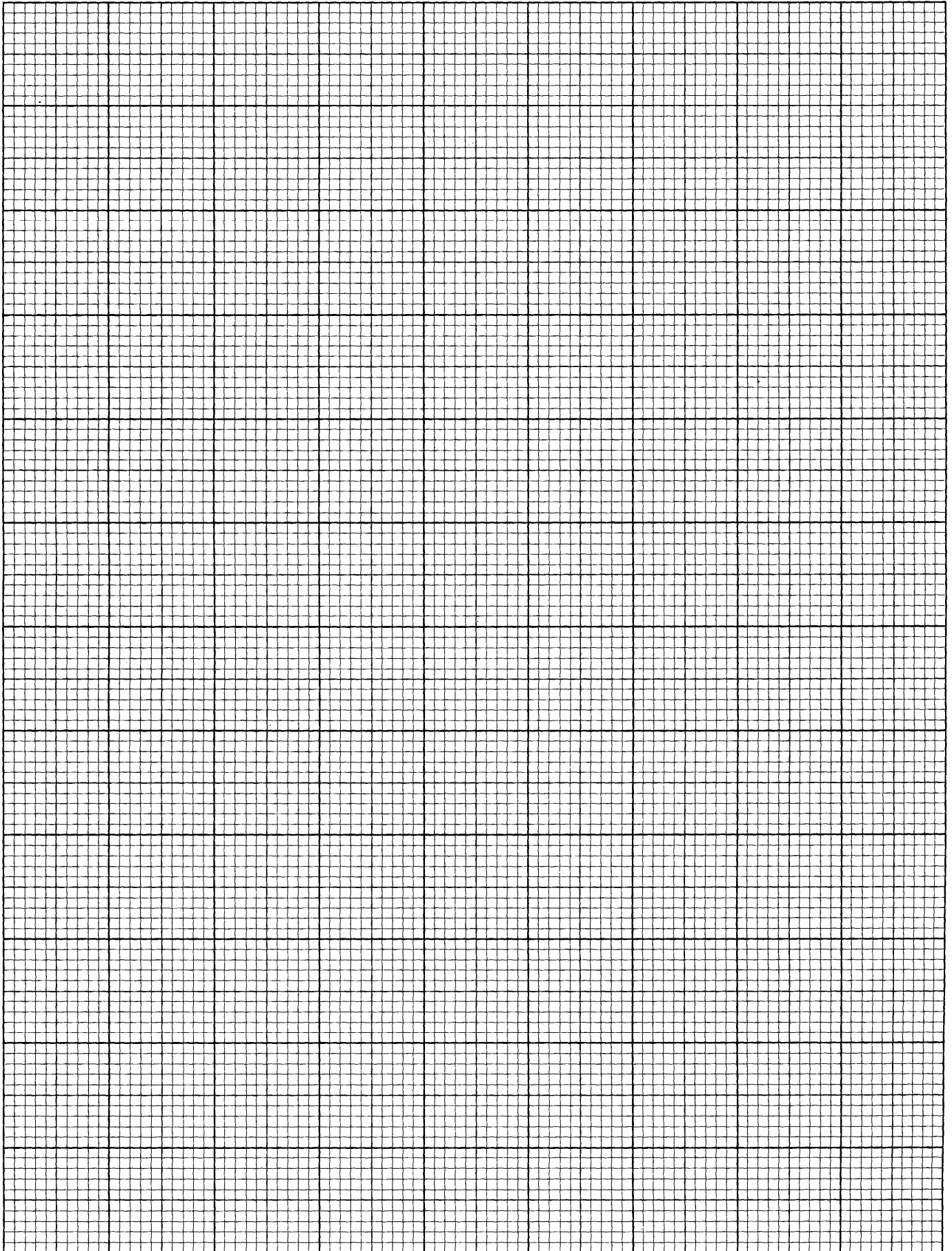
(c) Refer graph on page 21

*Rujuk graf pada muka surat 21*

(d) .....

.....

**Graph for Question 13/ Graf untuk Soalan 13**



- 14 (a) Factorise each of the following completely.

*Faktorkan selengkapnya setiap yang berikut.*

(i)  $8mn + 12n$

(ii)  $10 + k(k - 7)$

[2 marks]  
[2 markah]

- (b) Given the universal set

$$\xi = \{x : 20 \leq x \leq 35, x \text{ is an integer}\},$$

$$P = \{x : x \text{ is a multiple of } 5\},$$

$$Q = \{x : x \text{ is a prime number}\} \text{ and}$$

$$R = \{x : x \leq 29\}.$$

*Diberi set semesta*

$$\xi = \{x : 20 \leq x \leq 35, x \text{ ialah integer}\},$$

$$P = \{x : x \text{ ialah gandaan } 5\},$$

$$Q = \{x : x \text{ ialah nombor perdana}\} \text{ dan}$$

$$R = \{x : x \leq 29\}.$$

- (i) List the elements of the set  $Q$ .

*Senaraikan unsur-unsur bagi set  $Q$ .*

- (ii) Find  $P \cup Q \cap R'$ .

*Cari  $P \cup Q \cap R'$ .*

- (iii) Find  $n(Q \cap R)$ .

*Cari  $n(Q \cap R)$ .*

[5 marks]  
[5 markah]

- (c) (i) Find the gradient of a straight line whose equation is  $3x + 4y = 16$ .

*Cari kecerunan garis lurus yang mempunyai persamaan  $3x + 4y = 16$ .*

- (ii) Diagram 7 shows straight line  $PQ$  drawn on a Cartesian plane.  
*Rajah 7 menunjukkan garis lurus  $PQ$  dilukis pada suatu satah Cartesian.*

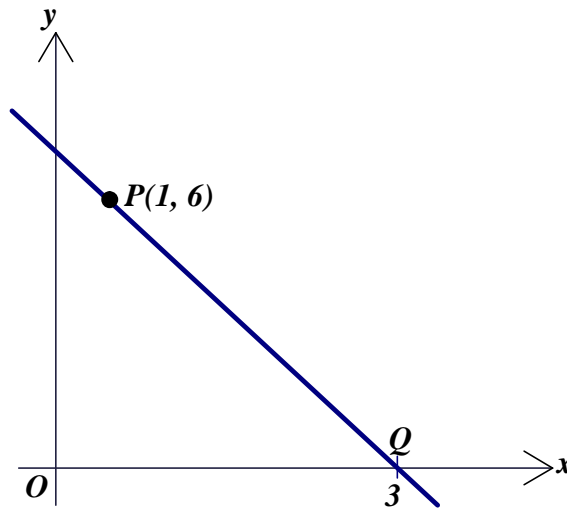


Diagram 7  
*Rajah 7*

Find the equation of the straight line  $PQ$ .

*Cari persamaan garis lurus  $PQ$ .*

[5 marks]  
[5 markah]

Answer / Jawapan :

- (a) (i)

- (ii)

(b) (i)

(ii)

(iii)

(c) (i)

(ii)



- 15 (a) In Diagram 8,  $QRS$  is a straight line.

*Dalam Rajah 8,  $QRS$  ialah garis lurus.*

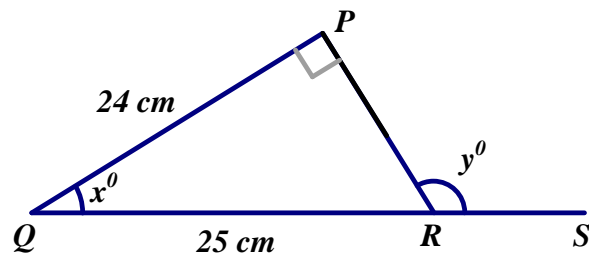


Diagram 8

*Rajah 8*

Calculate the value of  $\sin x^\circ + \cos y^\circ$ .

*Hitungkan nilai  $\sin x^\circ + \cos y^\circ$ .*

[4 marks]

[4 markah]

- (b) Diagram 9 shows two vertical poles  $EF$  and  $GH$  on a horizontal plane.

*Dalam Rajah 9,  $EF$  dan  $GH$  ialah dua batang tiang tegak yang terletak pada satu permukaan mengufuk.*

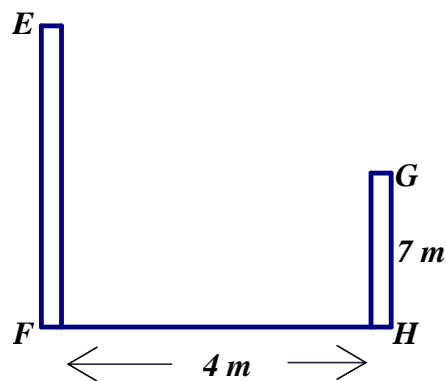


Diagram 9

*Rajah 9*

The angle of elevation of  $E$  from  $G$  is  $26^\circ$ .

Calculate the angle of depression of  $H$  from  $E$ .

*Sudut dongak  $E$  dari  $G$  ialah  $26^\circ$ .*

*Hitung sudut tunduk  $H$  dari  $E$ .*

[4 marks]

[4 markah]

- (c) Diagram 10 shows a prism with a horizontal square base  $HJKL$ . Trapezium  $EFLK$  is the uniform cross-section of the prism. The rectangular surface  $DEKJ$  is vertical while the rectangular surface  $GFLH$  is inclined.

*Rajah 10 menunjukkan sebuah prisma dengan tapak mengufuk  $HJKL$  yang berbentuk segi empat sama. Trapezium  $EFLK$  ialah keratan seragam prisma itu. Permukaan segi empat tepat  $DEKJ$  adalah tegak manakala permukaan segi empat tepat  $GFLH$  adalah condong.*

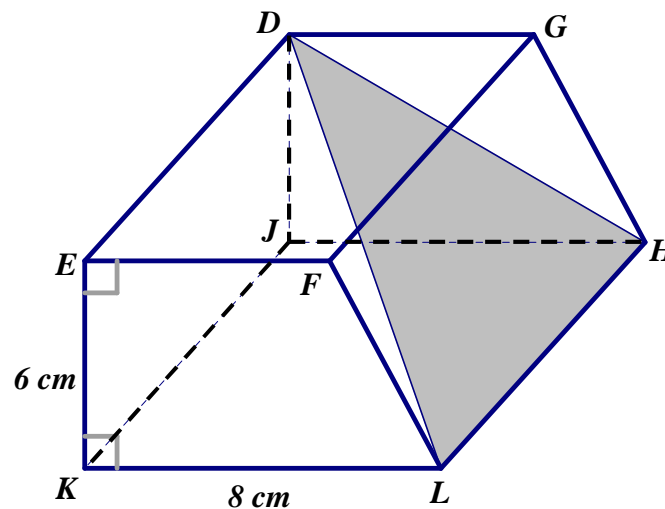


Diagram 10

Rajah 10

- (i) Name the angle between the plane  $DLH$  and the base  $HJKL$ .  
*Namakan sudut di antara satah  $DLH$  dengan tapak  $HJKL$ .*
- (ii) Calculate the angle between the plane  $DLH$  and the base  $HJKL$ .  
*Hitung sudut di antara satah  $DLH$  dengan tapak  $HJKL$*

[4 marks]  
[4 markah]

Answer / Jawapan :

(a)

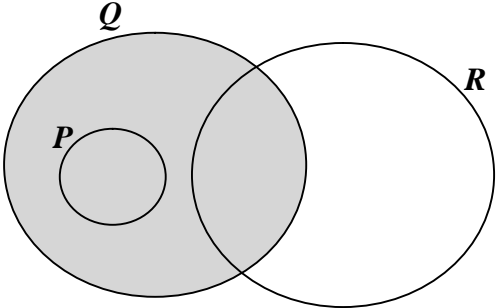
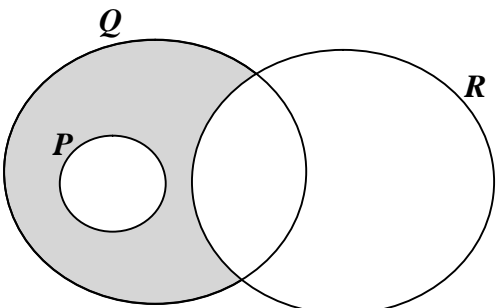
(b)

(c) (i)

(ii)

**END OF QUESTION PAPER**  
**KERTAS SOALAN TAMAT**

MATHEMATICS PAPER 2

No	Peraturan Pemarkahan	Markah	
1	<p>(a)</p>  <p>(b)</p> 	1	3
2	<p><math>4x - 8y = 16</math> <u>or</u> equivalent</p> <p><math>3y = -3</math> <u>or</u> equivalent</p> <p><b>OR</b></p> <p><math>x = \frac{8+4y}{2}</math> <u>or</u> <math>x = 4 + 2y</math> <u>or</u> equivalent</p> <p><math>3y = -3</math> <u>or</u> equivalent</p> <p><b>OR</b></p> <p><math>\frac{1}{(2)(-5) - (-4)(4)} \begin{pmatrix} -5 &amp; 4 \\ -4 &amp; 2 \end{pmatrix} \begin{pmatrix} 8 \\ 13 \end{pmatrix}</math></p> <p><math>x = 2</math></p> <p><math>y = -1</math></p>	K1 K1	K1 K1 K2 N1 N1

No	Peraturan Pemarkahan	Markah	
3	$\angle$ MUN $\tan \angle$ MUN = $\frac{7}{25}$ $\angle$ MUN = $15.64^\circ$ or $15^\circ 39'$ <u>Note:</u> NU = 25 seen award 1 mark.	1 2 1	4
4(a) 4(b) 4(c)	False If $x^5 = -32$ then $x = -2$ If $x = -2$ then $x^5 = -32$ $\frac{360}{8}$ $45^\circ$	1 1 1 1	5
5(a) 5(b) 5(c) 5(d)	or Some 5 is greater than zero $n + 2(3)^n$ $n = 0, 1, 2, \dots$	1 1 1 1 1	5
6	$x^2 - 3x = 0$ $x(x - 3) = 0$ $x = 0$ $x = 3$	1 1 1 1	4

No	Peraturan Pemarkahan	Markah	
7(a)	$\frac{k-3}{6-(-2)} = \frac{1}{2}$ $k = 7$	1	
7(b)	$m_{PQ} = \frac{1}{2}$ $3 = \frac{1}{2}(-2) + c$ $y = \frac{1}{2}x + 4$	1	
7(c)	$0 = \frac{x}{2} + 4$ $x\text{-intercept} = -8$	1	
		1	7
8	<p>(a) <math>x = 50^\circ</math></p> <p>(b) <math>y = \frac{120^\circ}{2}</math> <math>y = 60^\circ</math></p> <p>(c)</p> $\angle QRS = 180^\circ - 60^\circ \text{ or } 120^\circ$ $z = 360^\circ - 120^\circ - 120^\circ - 40^\circ$ $z = 80^\circ$	P1	
		K1	
		N1	
		K1	
		K1	
		N1	6
9	$\frac{1}{2} \times 12 \times 9 \times 10$ $\frac{22}{7} \times 2^2 \times 7$ $\frac{1}{2} \times 12 \times 9 \times 10 - \frac{22}{7} \times 2^2 \times 7$ <p><b>452</b></p>	K1	
		K1	
		K1	
		N1	4

No	Peraturan Pemarkahan	Markah	
10	<p>(a) <math>\frac{n(B)}{72} = \frac{2}{3}</math></p> <p>48</p> <p>(b) <math>n(R) = 20, n(B) = 46</math></p> <p><math>P(R) = \frac{20}{66}</math> or <math>\frac{10}{33}</math></p>	K1	N1
		K1	N1
			4
11	<p>(a) <math>\frac{120}{360} \times 2 \times \frac{22}{7} \times 7</math> or <math>\frac{90}{360} \times 2 \times \frac{22}{7} \times 12</math></p> <p><math>\frac{120}{360} \times 2 \times \frac{22}{7} \times 7 + \frac{90}{360} \times 2 \times \frac{22}{7} \times 12 + 7 + 12 + 5</math></p> <p><math>57 \frac{11}{21} = 57.52</math></p> <p>(b) <math>\frac{120}{360} \times \frac{22}{7} \times 7 \times 7</math> or <math>\frac{90}{360} \times \frac{22}{7} \times 12 \times 12</math> or <math>\frac{1}{2} \times 7 \times 12</math></p> <p><math>\frac{120}{360} \times \frac{22}{7} \times 7 \times 7 + \frac{90}{360} \times \frac{22}{7} \times 12 \times 12 - \frac{1}{2} \times 7 \times 12</math></p> <p><math>122 \frac{10}{21} = 122.48</math></p>	K1	K1
		N1	
		K1	
		K1	
		N1	6

No	Peraturan Pemarkahan	Markah																																														
12	<p>(a) 57</p> <p>Note: 55 – 59 , give P1</p> <p>(b)</p> <table border="1" data-bbox="389 472 1176 1216"> <thead> <tr> <th></th> <th>Mass (g)</th> <th>Frequency <i>i</i></th> <th>Upper Boundary</th> <th>Cumulative Frequency</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>40 – 44</td> <td>12</td> <td><b>44.5</b></td> <td><b>12</b></td> </tr> <tr> <td>II</td> <td>45 – 49</td> <td>20</td> <td><b>49.5</b></td> <td><b>32</b></td> </tr> <tr> <td>III</td> <td>50 – 54</td> <td>32</td> <td><b>54.5</b></td> <td><b>64</b></td> </tr> <tr> <td>IV</td> <td>55 – 59</td> <td>48</td> <td><b>59.5</b></td> <td><b>112</b></td> </tr> <tr> <td>V</td> <td>60 – 64</td> <td>44</td> <td><b>64.5</b></td> <td><b>156</b></td> </tr> <tr> <td>VI</td> <td>65 – 69</td> <td>26</td> <td><b>69.5</b></td> <td><b>182</b></td> </tr> <tr> <td>VII</td> <td>70 – 74</td> <td>14</td> <td><b>74.5</b></td> <td><b>196</b></td> </tr> <tr> <td>VIII</td> <td>75 – 79</td> <td>4</td> <td><b>79.5</b></td> <td><b>200</b></td> </tr> </tbody> </table> <p>Upper boundary: ( I until VIII )</p> <p>Cumulative frequency: ( I until VIII )</p> <p>(c) <u>Graph</u>:</p> <p>Uniform scale and correct axis</p> <p>Plot all 9 points correctly</p> <p>Smooth curve</p> <p>(d) (i) 166</p> <p>(ii) 63.5 -52.5</p> <p>= 11</p> <p><u>Note</u>: Do not accept answers without an ogive.</p>		Mass (g)	Frequency <i>i</i>	Upper Boundary	Cumulative Frequency	I	40 – 44	12	<b>44.5</b>	<b>12</b>	II	45 – 49	20	<b>49.5</b>	<b>32</b>	III	50 – 54	32	<b>54.5</b>	<b>64</b>	IV	55 – 59	48	<b>59.5</b>	<b>112</b>	V	60 – 64	44	<b>64.5</b>	<b>156</b>	VI	65 – 69	26	<b>69.5</b>	<b>182</b>	VII	70 – 74	14	<b>74.5</b>	<b>196</b>	VIII	75 – 79	4	<b>79.5</b>	<b>200</b>	<p>P2</p> <p>P1</p> <p>P2</p> <p>P1</p> <p>K2</p> <p>N1</p> <p>P1</p> <p>K1</p> <p>N1</p>	<p>12</p>
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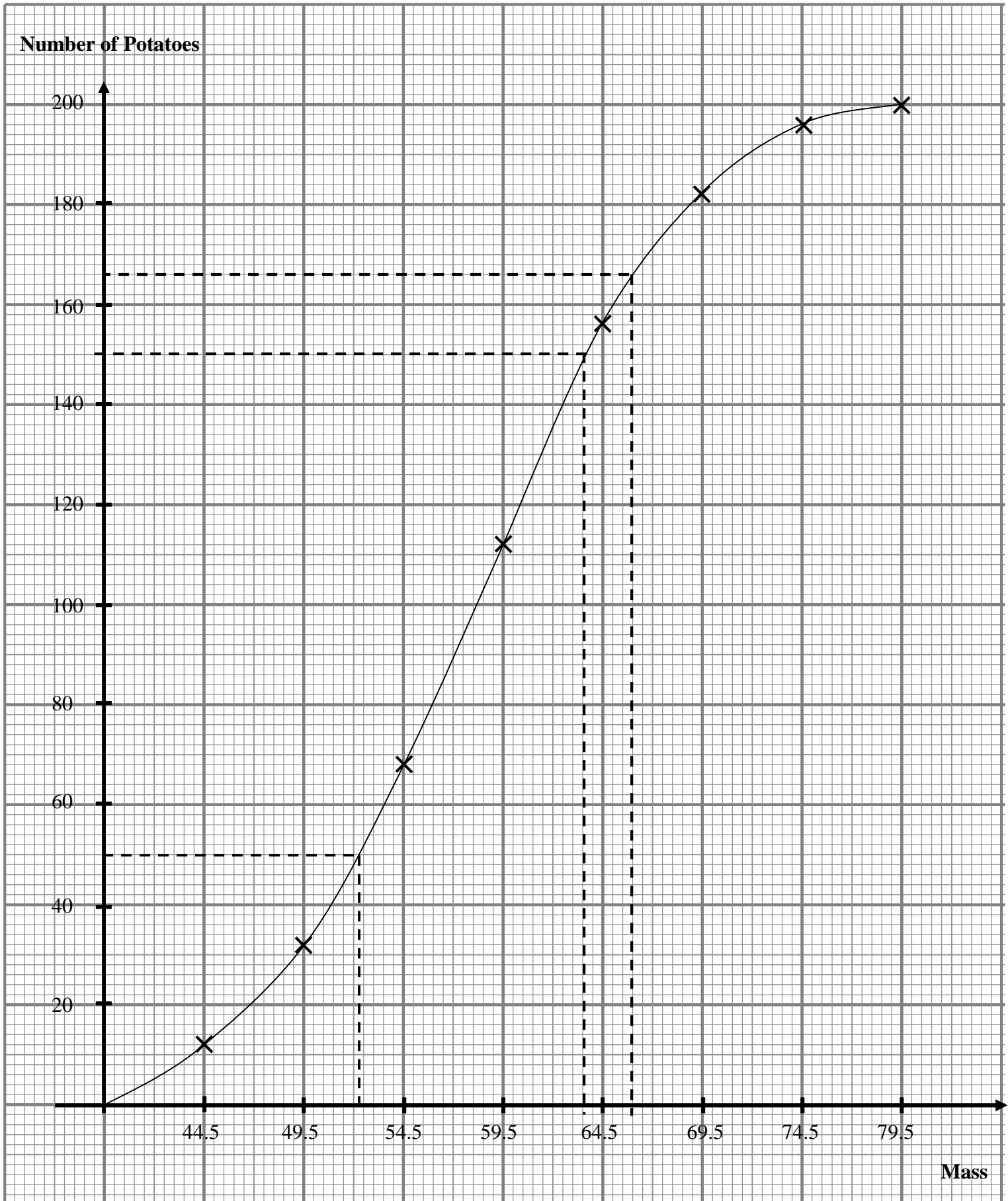


No	Peraturan Pemarkahan	Markah																																									
13	<p>(a)</p> <table border="1" data-bbox="497 297 1077 1200"> <thead> <tr> <th></th> <th>Mass (kg) <i>Jisim (kg)</i></th> <th>Frequency <i>Kekerapan</i></th> <th>Midpoint <i>Titik Tengah</i></th> </tr> </thead> <tbody> <tr> <td>I</td> <td>35 – 39</td> <td>0</td> <td>37</td> </tr> <tr> <td>II</td> <td>40 – 44</td> <td>5</td> <td>42</td> </tr> <tr> <td>III</td> <td>45 – 49</td> <td>7</td> <td>47</td> </tr> <tr> <td>IV</td> <td>50 – 54</td> <td>18</td> <td>52</td> </tr> <tr> <td>V</td> <td>55 – 59</td> <td>13</td> <td>57</td> </tr> <tr> <td>VI</td> <td>60 – 64</td> <td>4</td> <td>62</td> </tr> <tr> <td>VII</td> <td>65 – 69</td> <td>2</td> <td>67</td> </tr> <tr> <td>VIII</td> <td>70 – 74</td> <td>1</td> <td>72</td> </tr> <tr> <td>IX</td> <td>75 – 79</td> <td>0</td> <td>77</td> </tr> </tbody> </table> <p>Class Intervals: ( III until IX )</p> <p>Frequency: ( I until IX )</p> <p>Midpoint: ( I until IX )</p> <p>(b) <math display="block">\frac{(42 \times 5) + (47 \times 7) + (52 \times 18) + (57 \times 13) + (62 \times 4) + (67 \times 2) + (72 \times 1)}{50}</math></p> <p><math display="block">= \frac{2670}{50}</math></p> <p><math display="block">= 53.4</math></p>		Mass (kg) <i>Jisim (kg)</i>	Frequency <i>Kekerapan</i>	Midpoint <i>Titik Tengah</i>	I	35 – 39	0	37	II	40 – 44	5	42	III	45 – 49	7	47	IV	50 – 54	18	52	V	55 – 59	13	57	VI	60 – 64	4	62	VII	65 – 69	2	67	VIII	70 – 74	1	72	IX	75 – 79	0	77	<p>P1</p> <p>P2</p> <p>P1</p> <p>K2</p> <p>N1</p>	
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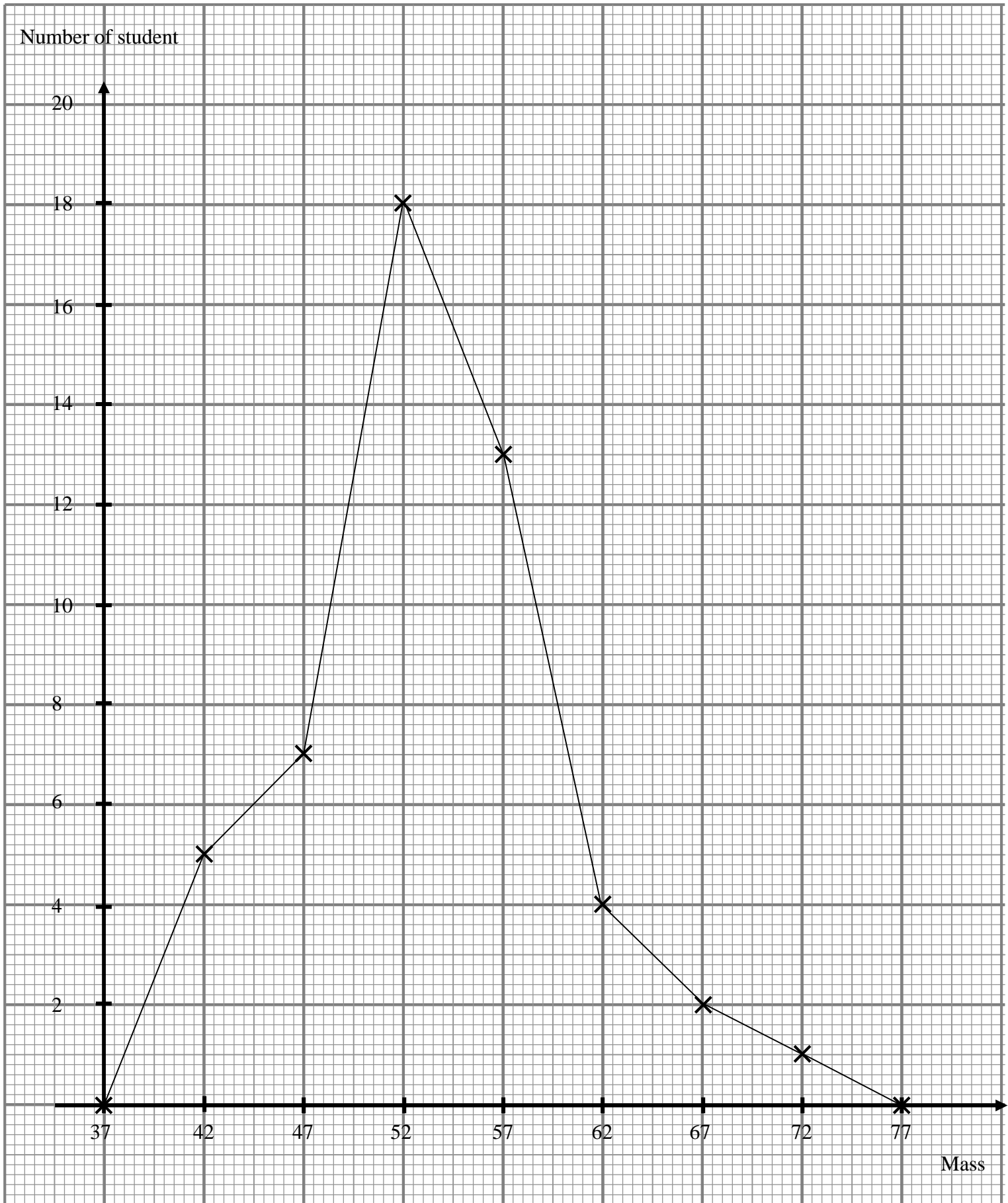
No	Peraturan Pemarkahan	Markah	
	<p>(c) Graph:</p> <p>Uniform scale and correct axis,</p> <p>Plot all 9 points correctly using midpoint or class interval as <math>x</math> – axis</p> <p>Correct polygon.</p> <p>(d) Modal class is 50 – 54</p> <p><b>OR</b></p> <p>Any correct information from the frequency polygon</p> <p><b>Note:</b> Do not accept answer without a frequency polygon.</p>	<p>P1</p> <p>K2</p> <p>N1</p> <p>P1</p>	<p>12</p>
<p>14(a)</p> <p>14(b)</p> <p>14(c)</p>	<p>(i) <math>4n(2m + 3)</math></p> <p>(ii) <math>(k - 5)(k - 2)</math></p> <p>(i) {23, 29, 31}</p> <p>(ii) {30, 31, 35}</p> <p><u>Note:</u> <math>P \cup Q = \{20, 23, 25, 29, 30, 31, 35\}</math> seen award 1 mark</p> <p>(iii) 2</p> <p><u>Note:</u> <math>Q \cap R = \{23, 29\}</math> seen award 1 mark</p> <p>(i) <math>m = -\frac{3}{4}</math></p> <p>(ii) <math>m_{PQ} = -3</math></p> <p><math>6 = -3(1) + c</math></p> <p><math>y = -3x + 9</math></p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p>	<p>12</p>

No	Peraturan Pemarkahan	Markah	
15(a)	$\sin x = \frac{7}{25}$	1	
	$\cos y = -\frac{7}{25}$	1	
	$\sin x + \cos y = 0$	2	
15(b)	$4 \tan 26^\circ$ or 1.951	1	
	$\tan x = \frac{1.951}{4}$	2	
	$x = 65.92^\circ$ or $65^\circ 55'$	1	
15(c)	<DHJ	1	
	Tan <DHJ = $\frac{6}{8}$	2	
	<DHJ = $36.87^\circ$ or $36^\circ 52'$	1	
			12

Graph for Question 12



Graph for Question 13



SELAMAT MAJU JAYA