

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

NO. KAD PENGENALAN

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ANGKA GILIRAN

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50/2
Matematik
Kertas 2

$1\frac{3}{4}$ jam

PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH CAWANGAN MELAKA

PEPERIKSAAN PERCUBAAN PENILAIAN MENENGAH RENDAH 2009

MATEMATIK

Kertas 2

Satu jam empat puluh lima minit

**JANGAN BUKA KERTAS
SOALAN INI SEHINGGA
DIBERITAHU**

1. *Tuliskan nombor kad pengenalan dan angka giliran anda pada ruang yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Penggunaan kalkulator tidak dibenarkan.*

<i>Kod Pemeriksa</i>		
Soalan	Markah Penuh	Markah Diperoleh
1	2	
2	2	
3	3	
4	3	
5	2	
6	2	
7	3	
8	3	
9	3	
10	3	
11	2	
12	3	
13	4	
14	3	
15	5	
16	4	
17	6	
18	2	
19	2	
20	3	
Jumlah	60	

Kertas soalan ini mengandungi 20 halaman bercetak

MATHEMATICAL FORMULAE
RUMUS MATEMATIK

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

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

RELATIONS
PERKAITAN

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

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

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

4. Distance / Jarak = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

5. Midpoint / Titik Tengah

$$(x, y) = \left[\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right]$$

6. Average speed = $\frac{\text{distance travelled}}{\text{time taken}}$

$$\text{Purata laju} = \frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$$

7. Mean = $\frac{\text{Sum of data}}{\text{Number of data}}$

$$\text{Min} = \frac{\text{hasil tambah nilai data}}{\text{bilangan data}}$$

8. Pythagoras Theorem / Teorem Pithagoras
 $c^2 = a^2 + b^2$

SHAPES AND SPACE
BENTUK DAN RUANG

1. Area of rectangle = length x width
Luas segiempat tepat = panjang × lebar
2. Area of triangle = $\frac{1}{2} \times \text{base} \times \text{height}$
Luas segitiga = $\frac{1}{2} \times \text{tapak} \times \text{tinggi}$
3. Area of parallelogram = base × height
Luas segiempat selari = tapak × tinggi
4. Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
Luas trapezium = $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$
5. Circumference of circle = $\pi d = 2\pi r$
Lilitan bulatan = $\pi d = 2\pi r$
6. Area of circle = πr^2
Luas bulatan = πr^2
7. Curved surface area of cylinder = $2\pi rh$
Luas permukaan melengkung silinder = $2\pi r t$
8. Surface area of sphere = $4\pi r^2$
Luas permukaan sfera = $4\pi r^2$
9. Volume of right prism = cross sectional area × length
Isipadu prisma tegak = luas keratan rentas × panjang
10. Volume of cuboid = length × width × height
Isipadu kuboid = panjang × lebar × tinggi
11. Volume of cylinder = $\pi r^2 h$
Isipadu silinder = $\pi r^2 t$
12. Volume of cone = $\frac{1}{3} \pi r^2 h$
Isipadu kon = $\frac{1}{3} \pi r^2 t$
13. Volume of sphere = $\frac{4}{3} \pi r^3$
Isipadu sfera = $\frac{4}{3} \pi r^3$

- 14 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
Isipadu piramid tegak = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
- 15 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
Hasil tambah sudut pedalaman poligon = $(n - 2) \times 180^\circ$
- 16
$$\frac{\text{Arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$
- 17
$$\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$
- 18 Scale factor / *Faktor skala*, $k = \frac{PA'}{PA}$
- 19 Area of image = $k^2 \times \text{area of object}$
Luas imej = $k^2 \times \text{luas objek}$

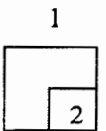
Answer **all** questions.

1 Calculate the value of $-25 + 2(11 - 7)$

Hitung nilai bagi $-25 + 2(11 - 7)$

[2 marks]
[2 markah]

Answer / *Jawapan* :

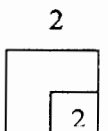


2 Find the value of $0.02 \div (\frac{1}{4} + \frac{1}{5})$ and express the answer as a fraction in its lowest term.

Cari nilai bagi $0.02 \div (\frac{1}{4} + \frac{1}{5})$ dan ungkapkan jawapannya sebagai satu pecahan dalam sebutan terendah.

[2 marks]
[2 markah]

Answer / *Jawapan*:



For
Examiner's
Use

SULIT

6

50/2

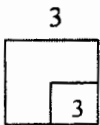
- 3 a) Find the value of 1.2^2
Cari nilai bagi 1.2^2
- b) Calculate the value of $\frac{1}{3}(\sqrt[3]{27} - 3^2)^3$.
Hitung nilai bagi $\frac{1}{3}(\sqrt[3]{27} - 3^2)^3$.

[3 marks]
[3 markah]

Answer / Jawapan :

a)

b)



- 4 Solve each of the following linear equations:
Selesaikan tiap-tiap persamaan linear berikut:

(a) $x + 15 = -5$

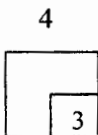
(b) $\frac{5m - 9}{2} = 3m - 2$

[3 marks]
[3 markah]

Answer / Jawapan :

a)

b)



50/2

SULIT

- 5 Diagram 1 shows a quadrilateral $ABCD$ which is drawn a Cartesian plane.
Rajah 1 menunjukkan sebuah sisiempat $ABCD$ yang dilukis pada suatu satah Cartesian.

$A'B'$ is the image of AB under a reflection on x -axis. On the diagram, complete the image of quadrilateral $ABCD$.

$A'B'$ ialah imej bagi AB di bawah satu pantulan pada paksi- x . Pada rajah itu, lengkapkan imej bagi sisiempat $ABCD$.

[2 marks]
[2 markah]

Answer / Jawapan:

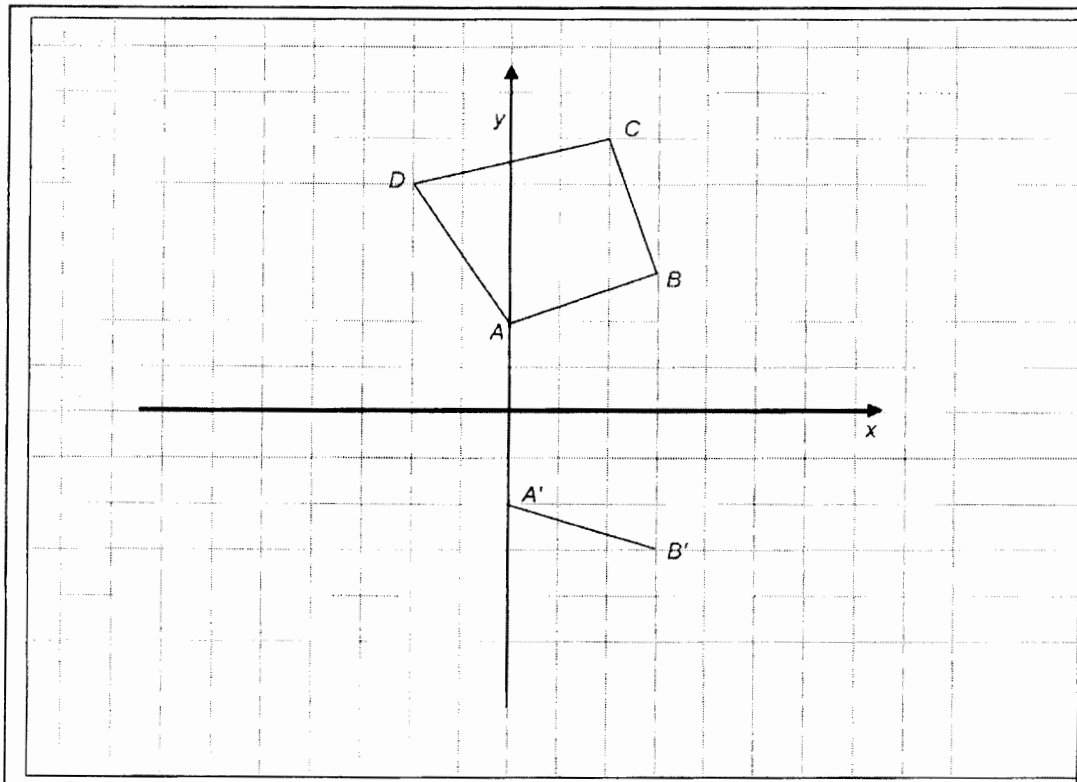
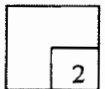


Diagram 1
Rajah 1

5



6

Diagram 2 in the answer space shows triangle R . R' is the image of R under a transformation W . State the coordinate of the image, Q' of point Q under the same transformation.

Rajah di ruang jawapan menunjukkan segitiga R . R' ialah imej kepada R di bawah satu transformasi W . Nyatakan koordinat imej, Q' bagi titik Q di bawah transformasi yang sama.

[2 marks]
[2 markah]

Answer / Jawapan :

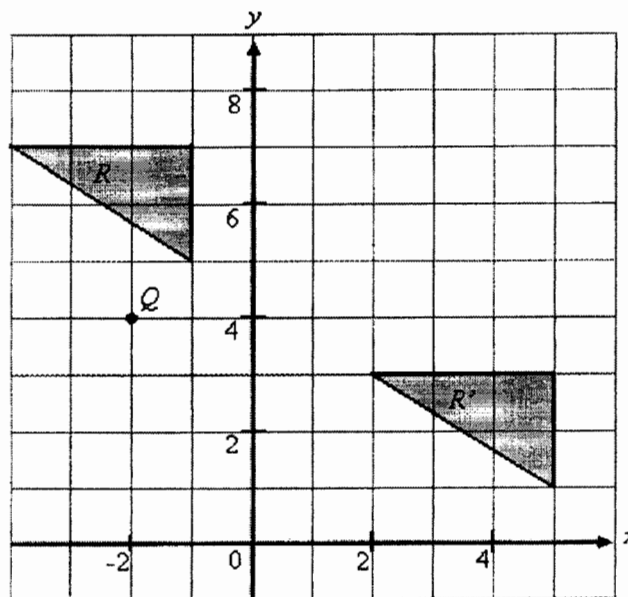


Diagram 2
Rajah 2

$Q' =$

6

2

7 Expand each of the following expressions:
Kembangkan tiap-tiap ungkapan berikut:

a) $-3p(4 + q)$

b) $(4r - 2)(r + 2)$

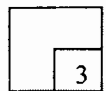
[3 marks]
[3 markah]

Answer / *Jawapan:*

a)

b)

7



8 Factorise completely each of the following expressions:
Faktorkan selengkapnya tiap-tiap ungkapan berikut:

a) $3y + 15$

b) $2x - 8x^3$

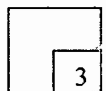
[3 marks]
[3 markah]

Answer / *Jawapan :*

a)

b)

8



9

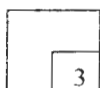
Express $\frac{2}{3m} - \frac{2-6n}{18mn}$ as a single fraction in its simplest form.

Ungkapkan $\frac{2}{3m} - \frac{2-6n}{18mn}$ sebagai satu pecahan tunggal dalam bentuk termudah.

[3 marks]
[3 markah]

Answer / Jawapan :

9



10

Solve each of the following inequalities:
Selesaikan tiap-tiap ketaksamaan yang berikut:

a) $x - 4 < -2$

b) $\frac{x}{2} + 6 \geq 2x - 9$

[3 marks]
[3 markah]

Answer / Jawapan :

a)

b)

10



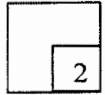
11 Given $2n = \frac{3m+5}{3}$, express m in terms of n .

Diberi $2n = \frac{3m+5}{3}$, nyatakan m dalam sebutan n

[2 marks]
[2 markah]

Answer / Jawapan :

11



12 a) Simplify $\frac{k^4}{k^{-2}} \times k$

Permudahkan $\frac{k^4}{k^{-2}} \times k$

b) Simplify $(x^{-6} \times 8x^3)^{\frac{1}{3}}$

Ringkaskan $(x^{-6} \times 8x^3)^{\frac{1}{3}}$

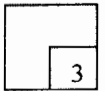
[3 marks]
[3 markah]

Answer / Jawapan :

a)

b)

12



- 13 The table 1 below shows the grades obtained by a group of students in a test.
Jadual di bawah menunjukkan gred yang diperolehi oleh sekumpulan murid dalam satu ujian.
- a) In Diagram 3, on the square grid provided, construct a bar chart to represent all the information given in the table by using an appropriate scale.
Dalam rajah 3, pada grid segiempat sama di bawah, lukis satu graf palang untuk menggambarkan data tersebut dengan skala yang sesuai.
- b) If the data is represented in a pie chart, calculate the angle of the sector that represents Grade E.
Jika data itu ditunjukkan sepenuhnya dalam suatu carta pai, hitung sudut sector bagi gred E.

[4marks]
[4 markah]

GRADE/GRED	A	B	C	D	E
NUMBER OF STUDENTS/ BILANGAN MURID	12	24	8	10	6

Table 1
Jadual 1

Answer / *Jawapan* :

a)

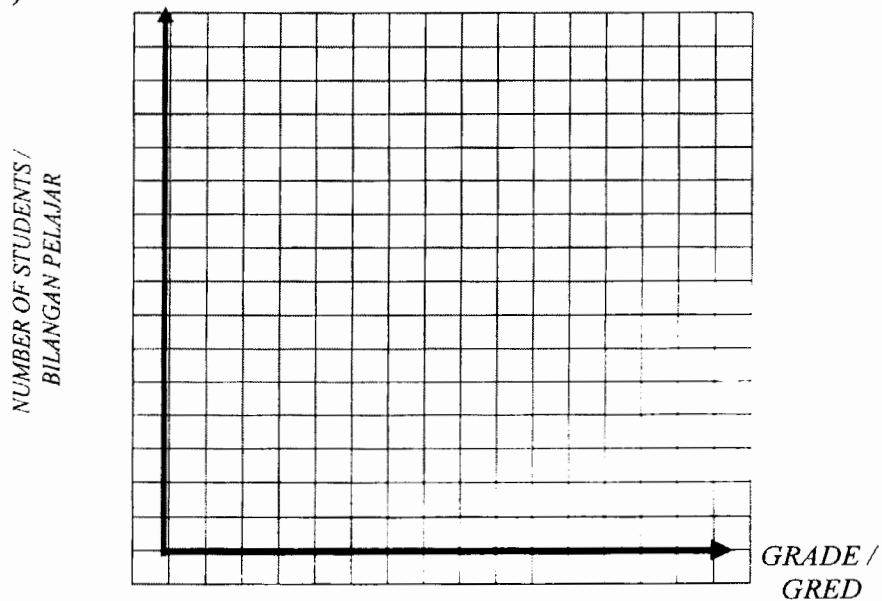
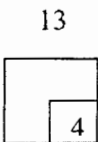


Diagram 3
Rajah 3

b)



- 14 Diagram 4 shows a prism. One of the surfaces of the net is drawn on a grid of equal squares with sides of 1 unit.
Rajah 4 menunjukkan sebuah prisma. Satu daripada muka bentangan prisma itu dilukis pada grid segiempat sama yang bersisi 1 unit

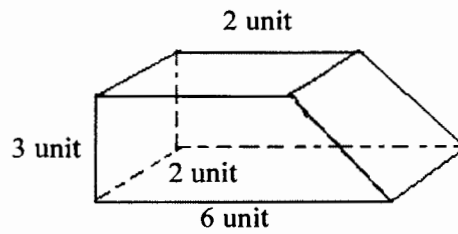
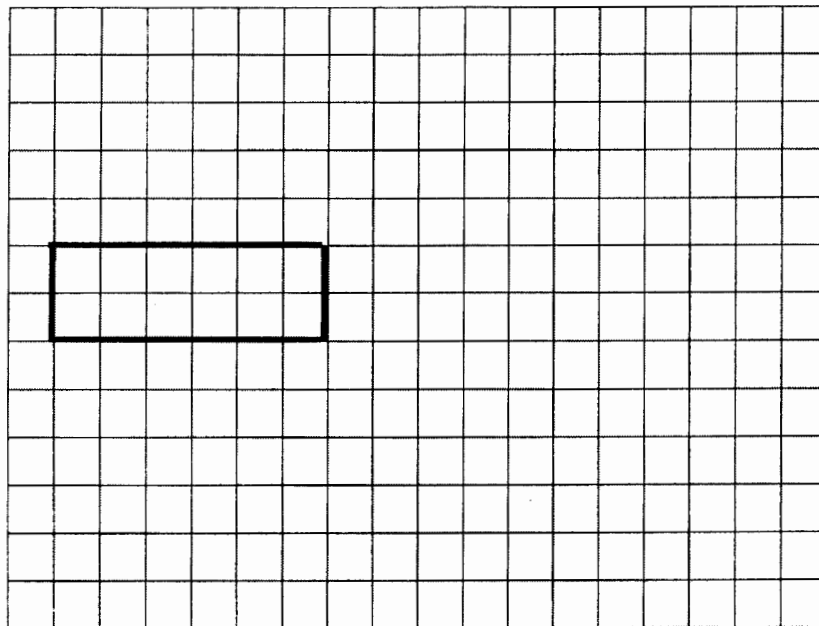


Diagram 4
Rajah 4

Complete the net of the prism.
Lengkapkan bentangan bagi prisma itu

[3 marks]
 [3 markah]

Answer / Jawapan :

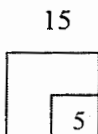
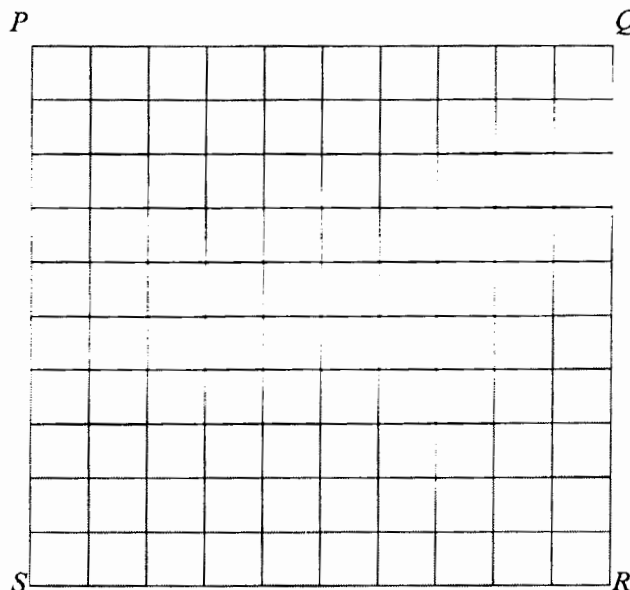


- 15 The diagram below shows a square $PQRS$ drawn on a square grid. X , Y and Z are three points which move in the diagram.
Rajah di bawah menunjukkan sebuah segiempat sama $PQRS$ yang dilukis pada grid segiempat sama. X, Y dan Z ialah tiga titik yang bergerak dalam rajah itu.
- a) X is the point which moves such that it is equidistant from lines QR and RS .
By using the letters in the diagram, state the locus of X .
 X ialah titik yang bergerak dengan keadaan jaraknya dari garis lurus QR dan RS adalah sama. Dengan menggunakan huruf abjad pada rajah itu, nyatalah lokus bagi X .
- b) On the diagram, draw
Pada rajah, lukis
- (i) the locus of point Y which moves such that its perpendicular distance from line RS is always 2 units.
Lokus bagi titik Y yang bergerak dengan keadaan jarak tegaknya dari garis RS sentiasa 2 unit.
- (ii) the locus of point Z which moves such that its distance from point Q is always 10 units.
Lokus bagi titik Z yang bergerak dengan keadaan jaraknya dari titik Q sentiasa 10 unit.
- c) Hence, mark with the symbol \otimes all the intersection point of the loci of Y and Z .
Seterusnya, tandakan dengan symbol \otimes , titik persilangan lokus Y dan Z itu
[5 marks]
[5 markah]

Answer / Jawapan :

a)

b)



- 16 In Diagram 5, $PQRS$ is a rhombus and PST is a straight line.
Dalam Rajah 5, $PQRS$ ialah sebuah rhombus dan PST ialah garis lurus.

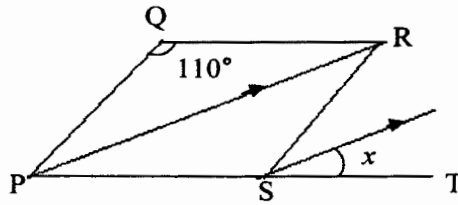


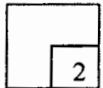
Diagram 5
Rajah 5

Find the value of x .
Cari nilai x .

Answer / *Jawapan:*

[2 marks]
 [2 markah]

16



- 17 The diagram below shows a regular hexagon.
Gambarajah di bawah menunjukkan hexagon sekata.

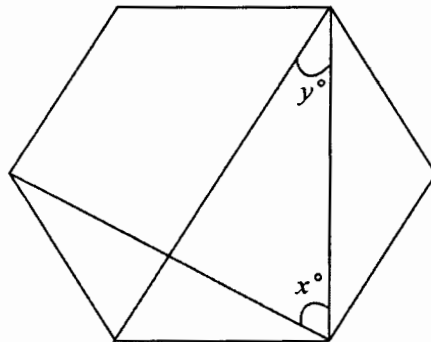


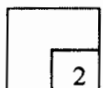
Diagram 6
Rajah 6

Find the value of $x - y$
Cari nilai bagi $x - y$

Answer / *Jawapan:*

[2 marks]
 [2 markah]

17



- 18 Use the graph paper provided to answer this question.
Guna kertas graf untuk menjawab soalan ini.

<i>x</i>	-3	-2	-1	0	1	2.5	4
<i>y</i>	13	2	-5	-8	-7	2	20

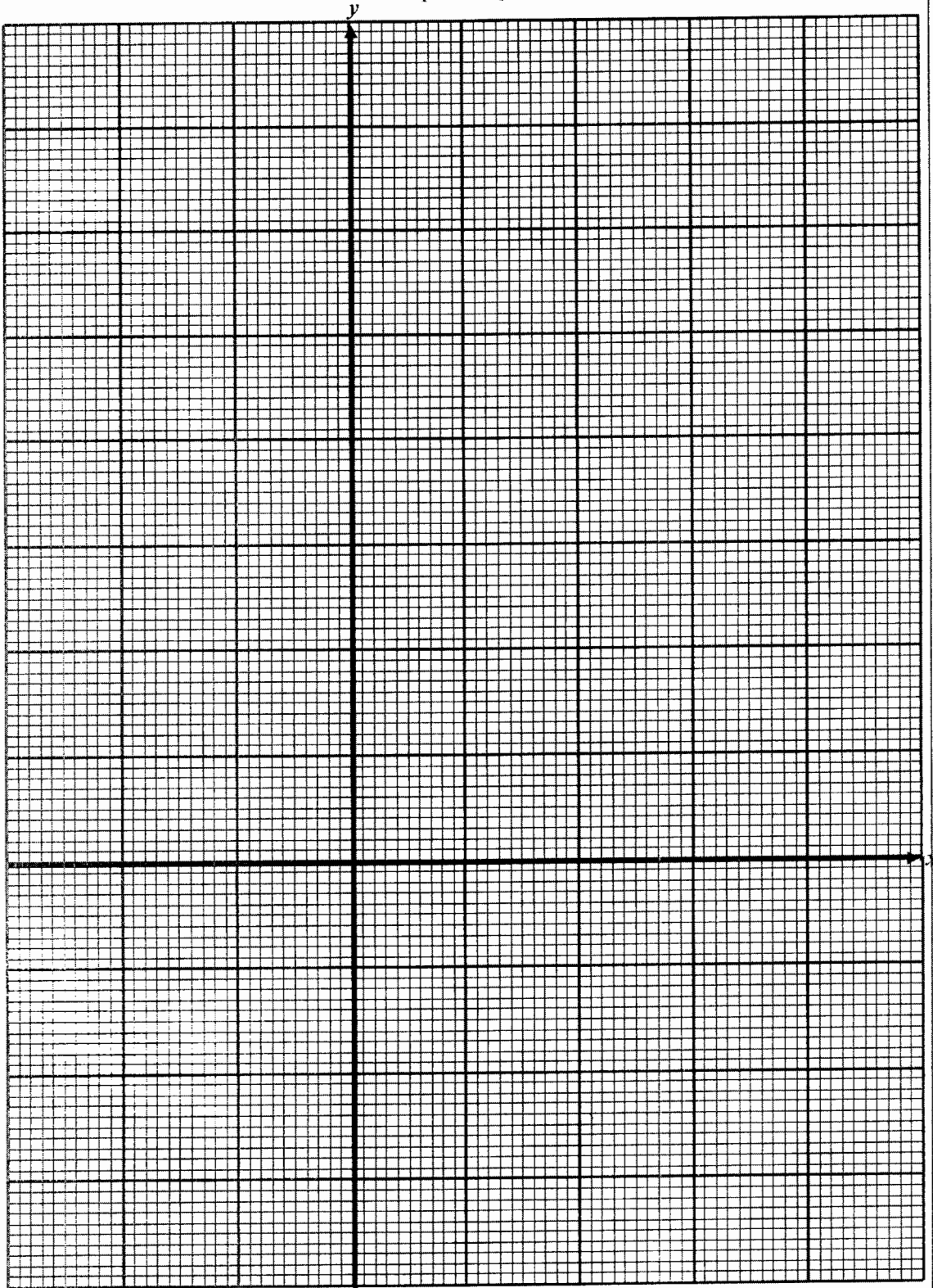
Table 2
Jadual 2

The table above represents the table of values of a certain function.
Using a scale of 2cm to 1 unit on the x-axis and 2cm to 5 units on the y-axis,
draw the graph.

*Jadual di atas menunjukkan nilai dua pembolehubah bagi suatu fungsi.
Dengan mengguna skala 2cm kepada 1 unit pada paksi-x dan 2cm kepada 5 unit
pada paksi-y, lukis graf fungsi itu.*

[4 marks]
[4 markah]

Graph for Question 18



18

4

- 19 Set squares and protractors are **not** allowed to be used in section (a) of this question.
Sesiku dan protractor tidak dibenarkan untuk bahagian (a) dalam soalan ini.

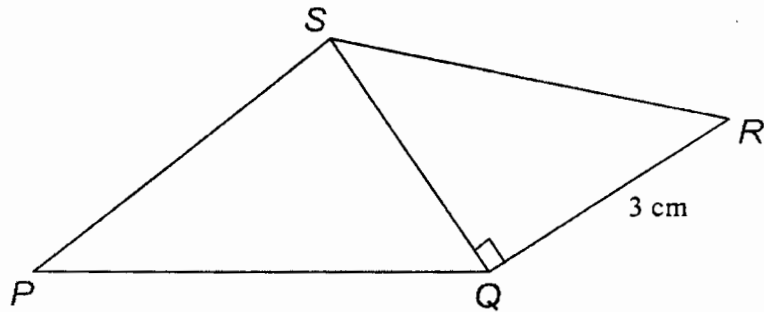


Diagram 7
Rajah 7

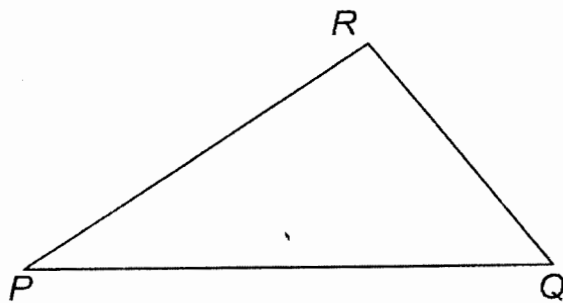
The diagram 7 shows a quadrilateral $PQRS$.
Rajah 7 di bawah menunjukkan sebuah segiempat, PQRS.

- a) Starting with triangle PQS in the diagram in the answer space, construct,
Mula dengan segitiga PQS yang diberi di ruang jawapan, lukis
- (i) the quadrilateral $PQRS$, to form the diagram above
segiempat PQRS untuk membentuk rajah di atas
 - (ii) the perpendicular QT from point Q to the straight line SR
Garis seranjang QT dari titik Q ke garis RS
- b) Based on the diagram drawn in (a), measure
Berdasarkan rajah yang dibina di (a) ukur
- (i) the distance between the point R and T
jarak antara titik R dan T
 - (ii) $\angle QRT$

[6 marks]
[6 markah]

Answer / Jawapan :

a)



b) i)

ii)

- 20 In Diagram 8, MNK is a straight line and $LM = MN$.
Dalam rajah 8, MNK ialah garis lurus dan $LM = MN$.

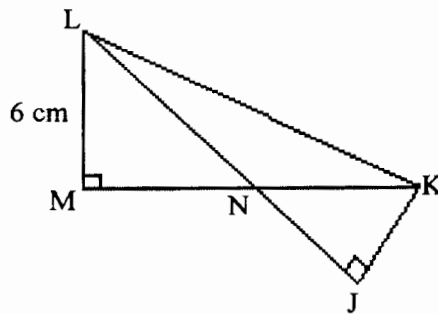


Diagram 8
Rajah 8

It is given that $\tan \angle LKM = \frac{3}{4}$ and $\cos \angle JKN = \frac{1}{2}$

Find $\sin \angle JLK$

Diberi $\tan \angle LKM = \frac{3}{4}$ dan $\cos \angle JKN = \frac{1}{2}$

Cari $\sin \angle JLK$

[3 marks]
[3 markah]

Answer/ Jawapan:

20

