

RUMUS MATEMATIK

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

PERKAITAN

- $a^m \times a^n = a^{m+n}$
- $a^m \div a^n = a^{m-n}$
- $(a^m)^n = a^{mn}$
- Jarak = $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$
- Titik Tengah

$$(x,y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$
- Purata laju = $\frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$
- Min = $\frac{\text{hasil tambah nilai data}}{\text{bilangan data}}$
- Teorem Pithagoras

$$c^2 = a^2 + b^2$$

BENTUK DAN RUANG

- Luas segiempat tepat = panjang x lebar
- Luas segitiga = $\frac{1}{2}$ x tapak x tinggi
- Luas segiempat selari = tapak x tinggi
- Luas trapezium

$$= \frac{1}{2} \times (\text{hasil tambah dua sisi selari}) \times \text{tinggi}$$
- Lilitan bulatan = $\pi d = 2\pi r$
- Luas Bulatan = πr^2
- Luas permukaan melengkung silinder

$$= 2\pi r t$$
- Luas permukaan sfera = $4\pi r^2$
- Isipadu prisma tegak

$$= \text{luas keratan rentas} \times \text{panjang}$$
- Isipadu kuboid = panjang x lebar x tinggi
- Isipadu silinder = $\pi r^2 t$
- Isipadu kon = $\frac{1}{3} \pi r^2 t$
- Isipadu sfera = $\frac{4}{3} \pi r^3$
- Isipadu peramid tegak

$$= \frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$$
- Hasil tambah sudut pedalaman poligon

$$= (n - 2) \times 180^\circ$$
- $\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
- $\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
- Faktor skala, $k = \frac{P'A'}{PA}$
- Luas imej = k^2 x luas objek

For
Examiner's
Use

Answer all questions.

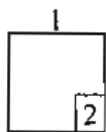
- 1 Calculate the value of:

Hitung nilai bagi:

$$27 - (6 + 32 \div 8)$$

Answer / Jawapan:

[2 marks]

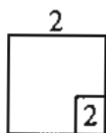


- 2 Calculate the value of $\left(\frac{5}{7} - \frac{3}{5}\right) \times 1\frac{2}{3}$ and express the answer as a fraction in its lowest term.

Hitung nilai bagi $\left(\frac{5}{7} - \frac{3}{5}\right) \times 1\frac{2}{3}$ dan ungkapkan jawapannya sebagai satu pecahan dalam sebutan terendah.

Answer / Jawapan:

[2 marks]



- 3 (a) Find the value of :

Cari nilai bagi :

$$\left(\frac{1}{2}\right)^3$$

- (b) Calculate the value of :

Hitung nilai bagi :

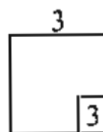
$$(\sqrt[3]{27} - 1.8)^2$$

[3 marks]

Answer / Jawapan:

(a)

(b)

*For
Examiner's
Use*

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

(a) $\frac{6}{m} = 3$

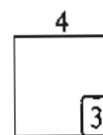
(b) $n + 2 = 3(4 - n)$

[3 marks]

Answer / Jawapan:

(a)

(b)



For
Examiner's
Use

- 5 Diagram 1 in the answer space shows P' as the image of P under an enlargement drawn on a grid of equal squares.

Rajah 1 di ruang jawapan menunjukkan P' sebagai imej bagi P di bawah satu pembesaran yang dilukis pada grid segiempat sama

- (i) On the Diagram 1 in the answer space, mark T as the centre of enlargement.
Pada Rajah 1 di ruang jawapan, tandakan T sebagai pusat pembesaran itu.
- (ii) Find the scale factor of the enlargement.
Nyatakan faktor skala bagi pembesaran itu.

[3 marks]

Answer / Jawapan:

(i)

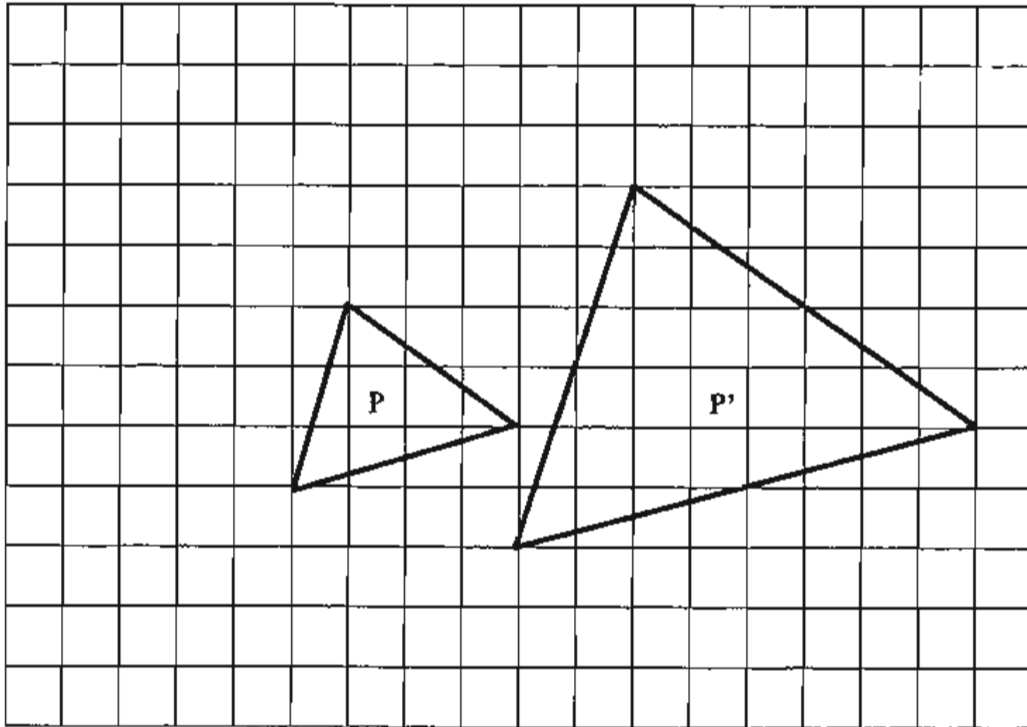
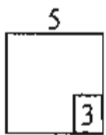


Diagram 1
Rajah 1

(ii)



- 6 Diagram 2 in the answer space shows two polygons, M and M', drawn on a grid of equal squares.

Diagram 2 di ruang jawapan menunjukkan dua poligon M dan M', yang dilukis pada grid segi empat sama yang sama besar.

M' is the image of M under a rotation 90° clockwise.

M' ialah image bagi M di bawah suatu putaran 90° ikut arah jam

- On Diagram 2, mark C as the centre of rotation.
Pada Rajah 2, tandakan C sebagai pusat putaran.
- State the coordinates of the centre of rotation.
Nyatakan titik koordinat bagi pusat putaran itu.

[2 marks]

Answer / Jawapan:

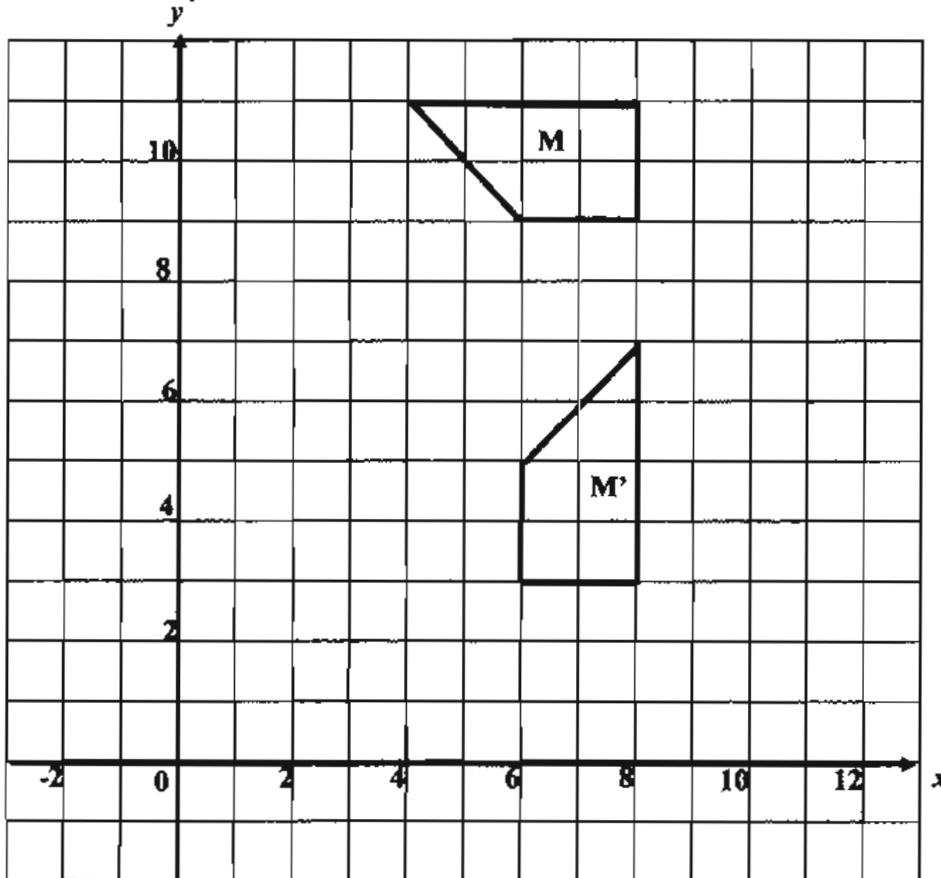
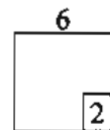


Diagram 2
Rajah 2

For
Examiner's
Use



For
Examiner's
Use

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

(a) $3x^2 + 27$

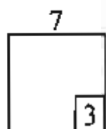
(b) $3p^2 + 24p + 48$

[3 marks]

Answer / Jawapan:

(a)

(b)



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

(a) $3(2x - 3y)$

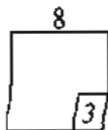
(b) $(m + 2)(m - 3)$

Answer / Jawapan:

[3 marks]

(a)

(b)



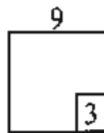
- 9 Express $\frac{1}{2n} - \frac{n+8}{6n^2}$ as a single fraction in its simplest form.

Ungkapkan $\frac{1}{2n} - \frac{n+8}{6n^2}$ sebagai pecahan tunggal dalam bentuk termudah.

Answer / Jawapan:

[3 marks]

For
Examiner's
Use



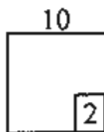
- 10 Solve the following inequalities:

Selesaikan ketaksamaan berikut:

$$8r + 3 \leq 9 + 5r$$

[2 marks]

Answer / Jawapan:



For
Examiner's
Use

11 Given $h^2 - 2m = p$, express h in terms of m and p .

Diberi $h^2 - 2m = p$, ungkapkan h dalam sebutan m dan p .

[2 marks]

Answer / Jawapan:

11

| |
|---|
| |
| 2 |

12 Given $4^{2x-1} = 64$, calculate the value of x .

Diberi $4^{2x-1} = 64$, hitung nilai bagi x .

[2 marks]

Answer / Jawapan:

12

| |
|---|
| |
| 2 |

- 13 (a) Find the value of:

Cari nilai bagi :

$$3^{\frac{5}{2}} \times 3^{\frac{1}{2}}$$

- (b) Simplify :

Permudahkan :

$$(5xy^3)^2 \div xy^4$$


[3 marks]

Answer / Jawapan:

(a)

(b)

*For
Examiner's
Use*

13


For
Examiner's
Use

- 14 Diagram 3 is a pie chart shows the number of 300 students on how they go to school.

Rajah 3 ialah carta pai yang menunjukkan bagaimana 300 orang pelajar pergi ke sekolah.

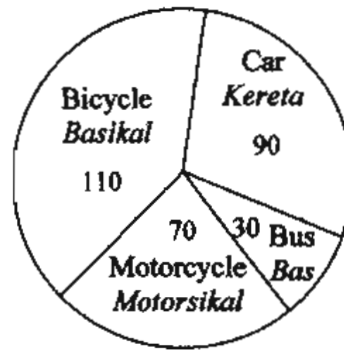


Diagram 3
Rajah 3

- (a) State the mode.
Nyatakan mod.
- (b) Calculate the percentages of students go to school by Car.
Hitung peratus pelajar yang pergi ke sekolah dengan Kereta.

[3 marks]

Answer / Jawapan:

(a)

(b)

14
3

- 15 Table 1 shows the number of handsets sold over four months.
Jadual 1 menunjukkan bilangan telefon bimbit yang dijual dalam tempoh empat bulan.

*For
Examiner's
Use*

| Month <i>Bulan</i> | January <i>Januari</i> | February <i>Febuari</i> | March <i>Mac</i> | April <i>April</i> |
|---|---------------------------|----------------------------|---------------------|-----------------------|
| Number of handset <i>Bilangan telefon bimbit</i> | 21 | 12 | 27 | 15 |

Table 1

Jadual 1

On Diagram 4 in the answer space, draw a line graph to represent all the information in Table 1.

Pada Rajah 4 di ruang jawapan, lukiskan satu graf garis untuk mewakili semua maklumat dalam Jadual 1.

[4 marks]

Answer / *Jawapan:*

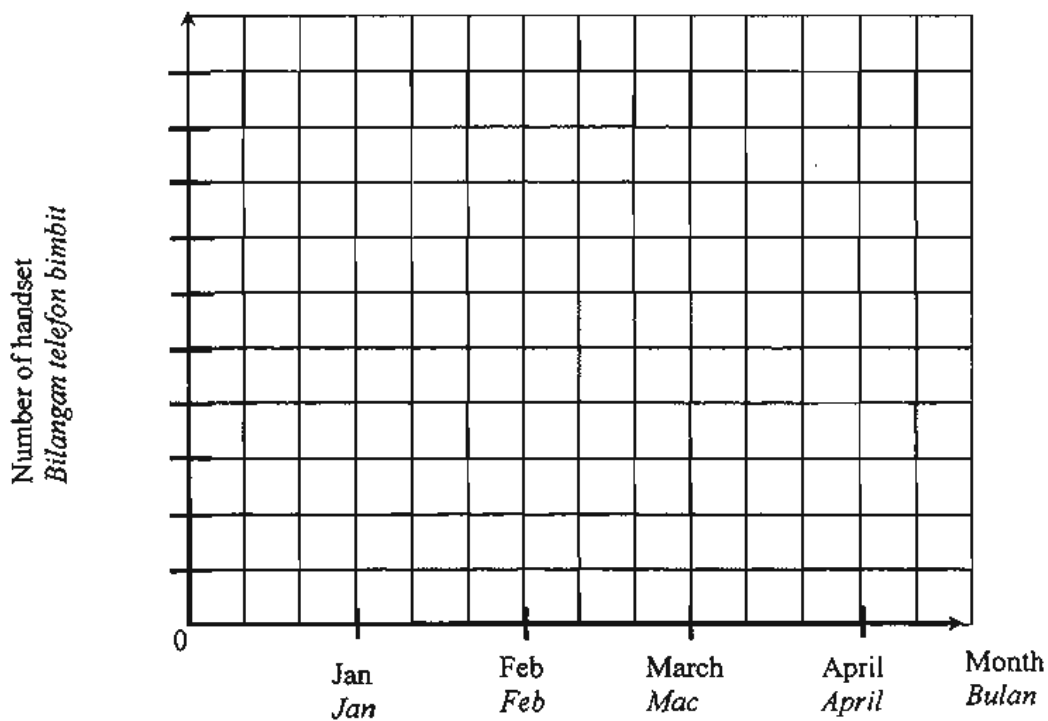


Diagram 4
Rajah 4

15

4

For
Examiner's
Use

- 16 Diagram 5 in the answer space shows a square PQRS with sides of 8 units drawn on a grid of equal squares with sides of 1 unit. X , Y and Z are three moving points inside the square.
- Rajah 5 di ruang jawapan menunjukkan sebuah segi empat sama PQRS dengan sisi 8 unit yang dilukis pada grid segi empat sama bersisi 1 unit. X , Y dan Z adalah tiga titik yang bergerak di dalam segi empat sama itu.*
- (a) X is the point which moves such that it is constantly 4 unit from the point K.
Describe fully the locus of X .
- X ialah titik yang bergerak dengan keadaan titik itu sentiasa berjarak 4 unit dari titik K.
Huraikan selengkapnya lokus bagi X .*
- (b) On diagram 5, draw
Pada rajah 5, lukis
- (i) the locus of the point Y which moves such that its distance is constantly 2 unit from line KM
lokus bagi titik Y yang bergerak dengan keadaan titik itu sentiasa berjarak 2 unit dari garis lurus KM.
- (ii) the locus of the point Z which moves such that it is always equidistant from the point P and the point R.
lokus bagi titik Z yang bergerak dengan keadaan jaraknya adalah sentiasa sama dari titik P dan titik R.
- (c) Hence, mark with the symbol \otimes the intersection of the locus of Y and the locus of Z .
Seterusnya, tandakan dengan simbol \otimes kedudukan bagi semua persilangan lokus Y dan lokus Z itu.

[5 marks]

Answer / Jawapan:

(a)

(b) (i), (ii)

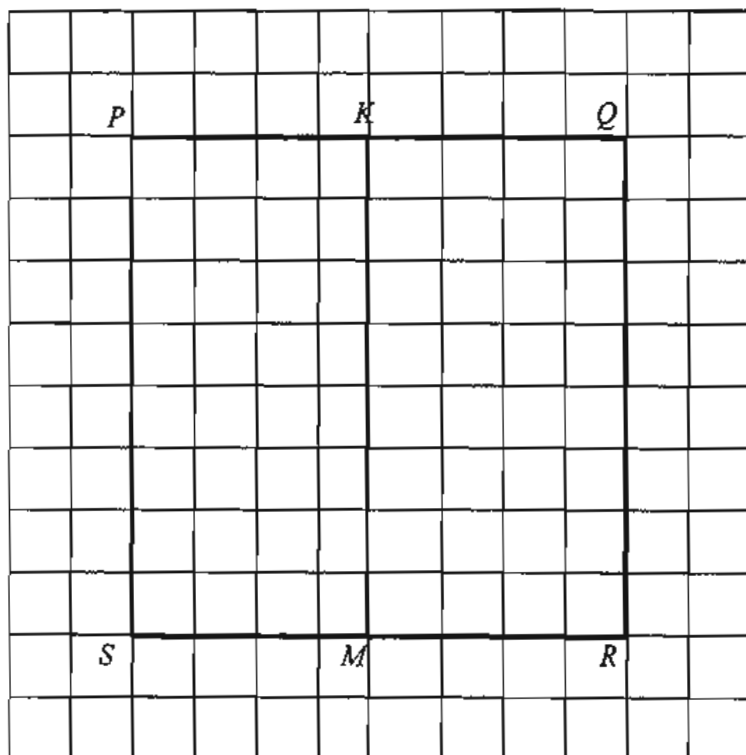
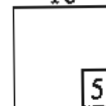


Diagram 5
Rajah 5

For
Examiner's
Use

16



For
Examiner's
Use

- 17 Diagram 6 shows polygon L drawn on a grid of equal squares with sides of 1 unit.

Rajah 6 menunjukkan poligon L yang dilukis pada grid segi empat sama bersisi 1 unit.

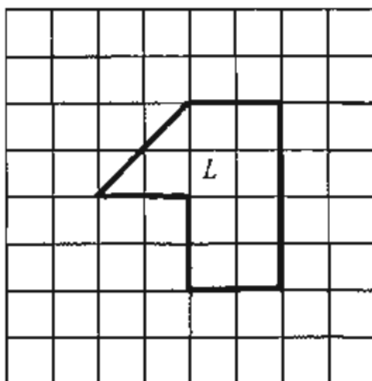


Diagram 6

Rajah 6

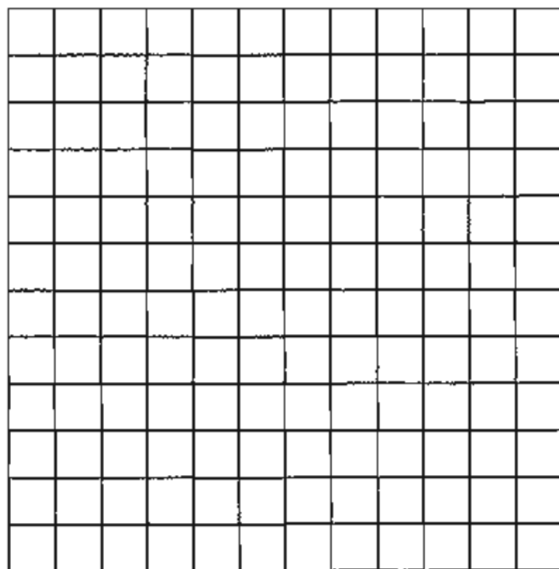
On the grid in the answer space, redraw the polygon L using the scale $1 : \frac{1}{2}$.

Pada grid di ruang jawapan, lukis semula poligon L menggunakan skala

$$1 : \frac{1}{2}.$$

[2 marks]

Answer / Jawapan



17



- 18 In Diagram 7, PQR and SPT are right angled triangles. PTR is a straight line.

Dalam Rajah 7, PQR dan SPT ialah segi tiga bersudut tegak. PTR ialah garis lurus.

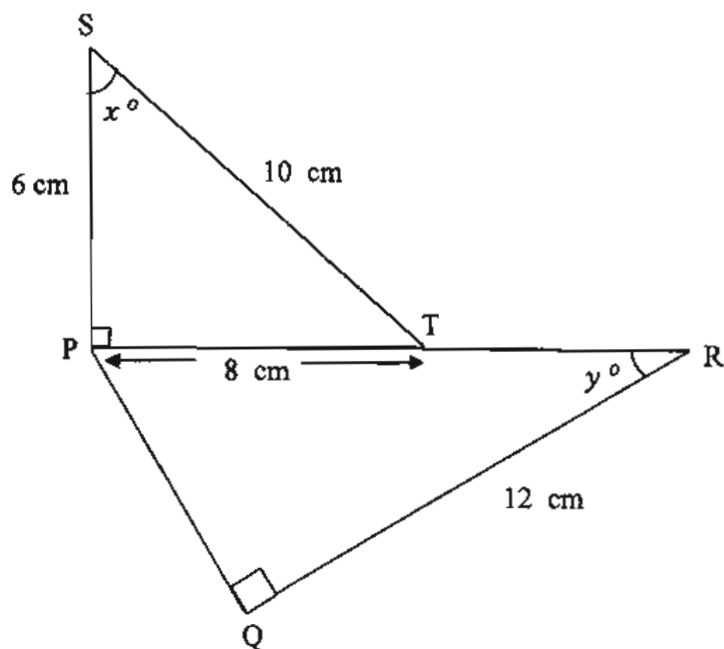


Diagram 7
Rajah 7

It is given that $\cos y^\circ = \frac{4}{5}$.

Diberi bahawa $\cos y^\circ = \frac{4}{5}$.

- (a) Find the value of $\tan x^\circ$.
Cari nilai bagi $\tan x^\circ$.
- (b) Calculate the length, in cm, of TR.
Hitung panjang, dalam cm, bagi TR.

[3 marks]

Answer / Jawapan :

(a)

(b)

For
Examiner's
Use

18
3

For
Examiner's
Use

19

Diagram 8.1 shows a triangle PQR drawn not to scale.

Rajah 8.1 menunjukkan sebuah segi tiga PQR yang dilukis tidak mengikut skala.

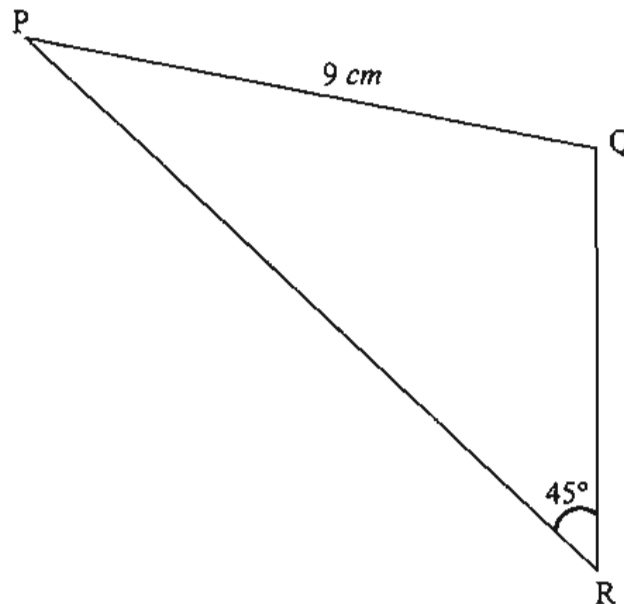


Diagram 8.1
Rajah 8.1

Diagram 8.2 in the answer space shows a straight line QR .

Rajah 8.2 dalam ruang jawapan menunjukkan garis lurus QR .

- (a) Using only a ruler and a pair of compasses, construct
Menggunakan pembaris dan jangka lukis sahaja, bina
- (i) triangle PQR to the measurements shown in Diagram,
segi tiga PQR menggunakan ukuran seperti yang ditunjukkan dalam Rajah,
 - (ii) the perpendicular line that passes through Q and intersect PR at S.
garis serenjang yang melalui Q dan bersilang dengan PR pada S.
- (b) Measure the perpendicular distance QS .
Ukur jarak tegak QS.

{6 marks}

Answer / Jawapan

(a)(i), (ii)

For
Examiner's
Use

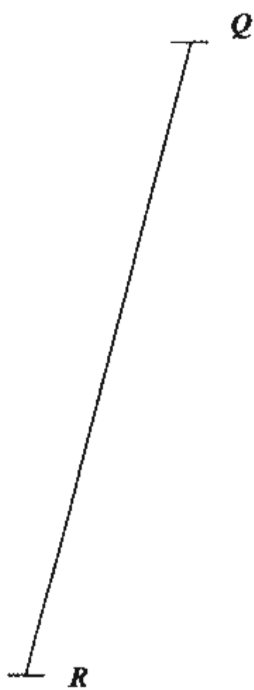
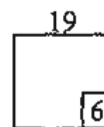


Diagram 8.2
Rajah 8.2

(b)



For
Examiner's
Use

- 20 Use the graph paper on page 21 to answer this question.
Guna kertas graf di halaman 21 untuk menjawab soalan ini.

Table 2 shows the values of two variables, x and y , of a function.
Jadual 2 menunjukkan nilai-nilai dua pembolehubah, x dan y , bagi suatu fungsi.

| | | | | | | | |
|-----|----|----|----|----|----|---|----|
| x | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| y | 22 | 7 | -2 | -5 | -2 | 7 | 22 |

Table 2
Rajah 2

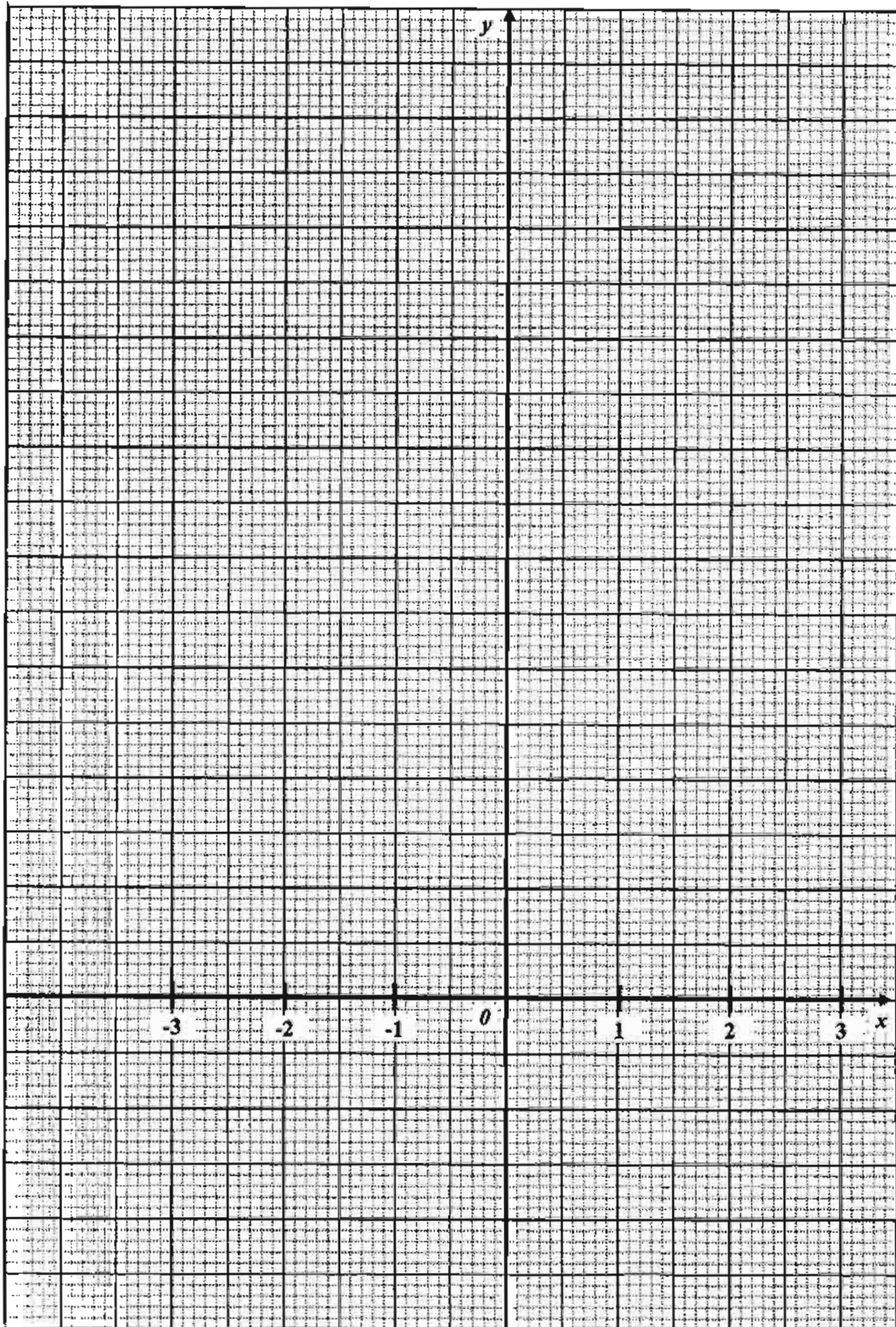
The x -axis and the y -axis are provided on the graph paper on page 21.
Paksi- x dan paksi- y telah disediakan pada kertas graf di halaman 21.

- (a) By using the scale of 2 cm to 5 units, complete and label the y -axis.
Dengan menggunakan skala 2 cm kepada 5 unit, lengkap dan labelkan paksi- y .
- (b) Based on Table 2, plot all the points on the graph paper.
Berdasarkan Jadual 2, plot semua titik pada kertas graf itu.
- (c) Hence, draw the graph of the function.
Seterusnya, lukis graf fungsi itu.

[4 marks]

Graph for Question 20
Graf untuk Soalan 20

For
Examiner's
Use



20

4

END OF QUESTION PAPER
KERTAS SOALAN TAMAT