

JAWAPAN

BAB
7

Koordinat Coordinates

1. Jarak PQ = Jarak mencancang
Distance of PQ Vertical distance

$$= 5 - 2$$

$$= 3 \text{ unit/ units}$$

- Jarak QR = Jarak mengufuk
Distance of QR Horizontal distance

$$= 5 - 1$$

$$= 4 \text{ unit/ units}$$

Menggunakan teorem Pythagoras,
Using Pythagoras theorem,

$$PR = \sqrt{PQ^2 + QR^2}$$

$$\text{Jarak PR} = \sqrt{3^2 + 4^2}$$

$$\text{Distance}$$

$$= \sqrt{25}$$

$$= 5 \text{ unit/ units}$$

- Jarak PR melalui Q
Distance of PR passing through Q

$$= 3 + 4$$

$$= 7 \text{ unit/ units}$$

Maka, jarak P ke R adalah jarak terpendek tanpa melalui Q.

Thus, the distance of P to R is the shortest distance without passes through Q.

2. (a) Jarak PQ/ Distance of PQ
= 12 - (-3)
= 15 unit/ units

- (b) Jarak PQ/ Distance of PQ
= 10 - (-15)
= 25 unit/ units

- (c) Jarak RS/ Distance of RS
= 4 - (-8)
= 12 unit/ units

- (d) Jarak RS/ Distance of RS
= 20 - (-10)
= 30 unit/ units

3. Jarak AB / Distance of AB = $x_2 - x_1$

$$\text{Jarak BC / Distance of BC} = y_2 - y_1$$

Menggunakan teorem Pythagoras

Using the Pythagoras theorem,

$$AC^2 = AB^2 + BC^2$$

$$= (x_2 - x_1)^2 + (y_2 - y_1)^2$$

$$AC = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

4. (a) Jarak PQ/ Distance of PQ

$$= \sqrt{(2 - 14)^2 + (5 - 0)^2}$$

$$= \sqrt{144 + 25}$$

$$= \sqrt{169}$$

$$= 13 \text{ unit / units}$$

- (b) Jarak PQ/ Distance of PQ

$$= \sqrt{[6 - (-2)]^2 + [4 - (-2)]^2}$$

$$= \sqrt{64 + 36}$$

$$= \sqrt{100}$$

$$= 10 \text{ unit / units}$$

- (c) Jarak PQ/ Distance of PQ

$$= \sqrt{(6 - 2)^2 + (5 - 2)^2}$$

$$= \sqrt{16 + 9}$$

$$= \sqrt{25}$$

$$= 5 \text{ unit / units}$$

- (d) Jarak PQ/ Distance of PQ

$$= \sqrt{(5 - 1)^2 + (1 - 4)^2}$$

$$= \sqrt{16 + 9}$$

$$= \sqrt{25}$$

$$= 5 \text{ unit / units}$$

- (e) Jarak PQ/ Distance of PQ

$$= \sqrt{[5 - (-1)]^2 + [4 - (-3)]^2}$$

$$= \sqrt{36 + 49}$$

$$= \sqrt{85}$$

$$= 9.22 \text{ unit / units}$$

- (f) Jarak PQ/ Distance of PQ

$$= \sqrt{(-2 - 6)^2 + [-12 - (-2)]^2}$$

$$= \sqrt{64 + 100}$$

$$= \sqrt{164}$$

$$= 12.81 \text{ unit / units}$$

5. (a) Dengan menggunakan teorem Pythagoras,

By using Pythagoras theorem,

$$QR^2 = PQ^2 - PR^2$$

$$= 17^2 - 15^2$$

$$= 289 - 225$$

$$= 64$$

$$QR = \sqrt{64}$$

$$= 8 \text{ unit / units}$$

Maka/ Thus, $x = 2 + 8$

$$= 10$$

Titik Q dan R adalah selari,

maka $y = 3$.

Point Q and point R are parallel,
then $y = 3$.

Koordinat P

Coordinates of P

$$= (10, 3 + 15)$$

$$= (10, 18)$$

- (b) (i) $QR = 5 - (-3)$

$$= 8 \text{ unit / units}$$

$$\frac{1}{2} \times PQ \times QR = 16$$

$$\frac{1}{2} \times PQ \times 8 = 16$$

$$PQ = 4$$

$$1 - m = 4$$

$$m = -3$$

- (ii) $PR^2 = 8^2 + 4^2$

$$= 80$$

$$PR = \sqrt{80}$$

$$= 8.94 \text{ unit / units}$$

- (c) $\sqrt{(4 - 10)^2 + (1 - q)^2} = 10$

$$6^2 + (1 - q)^2 = 10^2$$

$$(1 - q)^2 = 64$$

$$1 - q = \pm\sqrt{64}$$

$$= \pm 8$$

$$1 - q = 8 \quad 1 - q = -8$$

$$q = -7 \quad q = 9$$



>> Kaedah Alternatif ...

$$1 - 2q + q^2 = 64$$

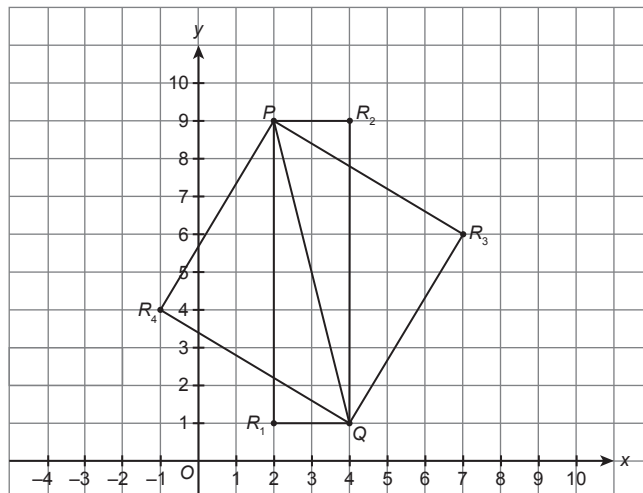
$$q^2 - 2q - 63 = 0$$

$$(q - 9)(q + 7) = 0$$

$$q = 9, q = -7$$

- (d) Koordinat yang mungkin bagi R ialah (2, 1), (4, 9), (7, 6) dan (-1, 4).

The coordinates of R could be (2, 1), (4, 9), (7, 6) and (-1, 4).



$$\begin{aligned} \text{(e) (i)} \quad &= \sqrt{(-2-3)^2 + (3-2)^2} \\ &= \sqrt{26} \\ &= 5.1 \text{ unit/ units} \end{aligned}$$

(ii) Katakan koordinat M ialah (x, y) / Let coordinates of M be (x, y)

Jarak mengufuk garis KL = Jarak mengufuk garis NM

Horizontal distance of line KL = Horizontal distance of line NM

$$\begin{aligned} \sqrt{(-2-3)^2} &= \sqrt{(-1-x)^2} \\ 25 &= (-1-x)^2 \\ 25 &= 1 + 2x + x^2 \end{aligned}$$

$$x^2 + 2x - 24 = 0$$

$$x = 4, x = -6$$

Jarak menegak garis KL = Jarak menegak garis NM

Vertical distance of line KL = Vertical distance of line NM

$$\begin{aligned} \sqrt{(3-2)^2} &= \sqrt{(-2-y)^2} \\ 1 &= (-2-y)^2 \\ 1 &= 4 + 4y + y^2 \end{aligned}$$

$$y^2 + 4y + 3 = 0$$

$$y = -1, y = -3$$

Oleh kerana garis KL adalah selari dengan garis NM dan M terletak pada sukuan IV, maka koordinat titik N ialah $(4, -3)$.

Since line KL is parallel to the line NM and M lies in the quadrant IV, thus the coordinates of point N are $(4, -3)$.

6. (a) (i) Titik tengah bagi garis PU =
Midpoint of line PU
- (ii) Titik tengah bagi garis QS =
Midpoint of line QS
- (iii) Q ialah titik tengah bagi garis =
 Q is the midpoint of line

- (b) (i) EH =
- (ii) BF =
- (iii) CG =
- (iv) AG =

7. (a) Titik tengah = $\left(3, \frac{5}{2}\right)$
Midpoint
- (b) Titik tengah = $(-1, 1)$
Midpoint

8. $PS = MT$
 $x - x_1 = x_2 - x$
 $2x = \frac{x_1 + x_2}{2}$
 $x = \frac{x_1 + x_2}{2}$

$MS = QT$
 $y - y_1 = y_2 - y$
 $2y = \frac{y_1 + y_2}{2}$
 $y = \frac{y_1 + y_2}{2}$

Maka, koordinat titik tengah, M
Thus, the coordinates of the midpoint, M

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

9. (a) Titik tengah RS / Midpoint of RS
 $= \left(\frac{-2+6}{2}, \frac{-2+4}{2} \right)$
 $= (2, 1)$

(b) Titik tengah AB / *Midpoint of AB*

$$= \left(\frac{1+7}{2}, \frac{3+(-5)}{2} \right)$$

$$= (4, -1)$$

(c) Titik tengah KL / *Midpoint of KL*

$$= \left(\frac{-20+5}{2}, \frac{12+(-6)}{2} \right)$$

$$= \left(-\frac{15}{2}, 3 \right)$$

(d) Titik tengah EF / *Midpoint of EF*

$$= \left(\frac{-4+0}{2}, \frac{9+7}{2} \right)$$

$$= (-2, 8)$$

(e) Titik tengah MN / *Midpoint of MN*

$$= \left(\frac{2+8}{2}, \frac{-1+1}{2} \right)$$

$$= (5, 0)$$

(f) Titik tengah / *Midpoint*

$$= \left(\frac{-5+7}{2}, \frac{4+(-12)}{2} \right)$$

$$= (1, -4)$$

(g) Titik tengah / *Midpoint*

$$= \left(\frac{-2+(-8)}{2}, \frac{3+(-5)}{2} \right)$$

$$= (-5, -1)$$

10. (a) Katakan / *Let $Q(x, y)$*

$$\left(\frac{-2+x}{2}, \frac{-8+y}{2} \right) = (1, -8)$$

$$\frac{-2+x}{2} = 1$$

$$-2+x = 2$$

$$x = 2+2$$

$$= 4$$

$$\frac{-8+y}{2} = -8$$

$$-8+y = -16$$

$$y = -16+8$$

$$= -8$$

$\therefore$ Koordinat Q / *Coordinates of $Q = (4, -8)$*

(b) $\frac{-1+h}{2} = 2$

$$-1+h = 4$$

$$h = 4+1$$

$$= 5$$

$$\frac{k+2}{2} = 3$$

$$k+2 = 6$$

$$k = 6-2$$

$$= 4$$

(c) Katakan / *Let $P = (x, y)$* ,

$$\left(\frac{x+3}{2}, \frac{y+5}{2} \right) = (-1, 3)$$

$$\frac{x+3}{2} = -1$$

$$x+3 = -2$$

$$x = -5$$

$$\frac{y+5}{2} = 3$$

$$y+5 = 6$$

$$y = 1$$

$$\therefore P = (-5, 1)$$

Titik Q ialah titik tengah PR .

Point Q is the midpoint of PR .

$$Q = \left(\frac{-5+(-1)}{2}, \frac{1+3}{2} \right)$$

$$= (-3, 2)$$

(d) Katakan koordinat- y yang telah dipadam ialah y . / *Let the y -coordinate that has been deleted be y .*

$$\frac{-2+y}{2} = -4$$

$$-2+y = -8$$

$$y = -6$$

Daripada pengiraan diketahui

From the calculation, it is known that

$$x_1 = 4, x_2 = 8$$

Dua kemungkinan pasangan titik bagi garis lurus / *Two possibilities for the pairs of points of the straight line*

$(4, -2)$ dan / *and* $(8, -6)$;

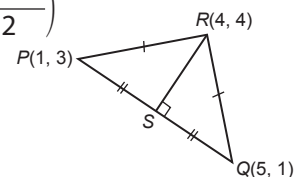
$(4, -6)$ dan / *and* $(8, -2)$.

(e) (i) S = Titik tengah garis PQ

Midpoint of line PQ

$$= \left(\frac{1+5}{2}, \frac{3+1}{2} \right)$$

$$= (3, 2)$$



(ii) S ialah titik tengah pepenjuru RT .

S is the midpoint of diagonal RT .

Katakan / *Let $T(x, y)$.*

$$\frac{x+4}{2} = 3$$

$$x+4 = 6$$

$$x = 6-4$$

$$= 2$$

$$\frac{y+4}{2} = 2$$

$$y+4 = 4$$

$$y = 4-4$$

$$= 0$$

$\therefore$ Koordinat T / *Coordinates of $T = (2, 0)$*



11. (a) (i) Panjang pagar dawai

The length of the wire fence

$$= \sqrt{[-23 - (-17)]^2 + (32 - 20)^2}$$

$$= \sqrt{180}$$

$$= 13.42 \text{ units/ units}$$

$$= (13.42 \times 1.2) \text{ km}$$

$$= 16.10 \text{ km}$$

Koordinat tiang/ *Coordinates of the pillar*

= Titik tengah bagi ST/ *Midpoint of ST*

$$= \left(\frac{-23 + (-17)}{2}, \frac{32 + 20}{2} \right)$$

$$= (-20, 26)$$

- (b) M = Titik tengah AC

Midpoint of AC

$$= \left(\frac{-2 + 6}{2}, \frac{4 + 0}{2} \right)$$

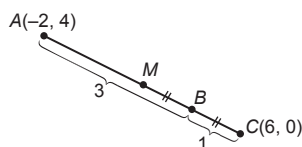
$$= (2, 2)$$

- B = Titik tengah MC

Midpoint of MC

$$= \left(\frac{2 + 6}{2}, \frac{2 + 0}{2} \right)$$

$$= (4, 1)$$



- (c) (i) $x - (-4) = 6$

$$x + 4 = 6$$

$$x = 2$$

$\therefore$ Koordinat R / *Coordinates of R* = (2, 6)

Koordinat Q ialah (2, -2).

The coordinates of Q are (2, -2).

Oleh itu, / *Therefore,*

$$QR = 6 - (-2)$$

$$= 8 \text{ km}$$

$$PQ = 2 - (-10)$$

$$= 2 + 10$$

$$= 12 \text{ km}$$

$$PS = \sqrt{[-4 - (-10)]^2 + [6 - (-2)]^2}$$

$$= \sqrt{6^2 + 8^2}$$

$$= \sqrt{100}$$

$$= 10 \text{ km}$$

- (ii) Jarak laluan peserta lelaki

Distance of route of male participants

$$= PQ + QR$$

$$= 12 + 8$$

$$= 20 \text{ km}$$

Jarak laluan peserta perempuan

Distance of route of female participants

$$= PS + SR$$

$$= 10 + 6$$

$$= 16 \text{ km}$$

Beza jarak / *Difference of distance*

$$= 20 - 16$$

$$= 4 \text{ km}$$

- (d) (i) Titik M ialah titik tengah bagi garis AC.

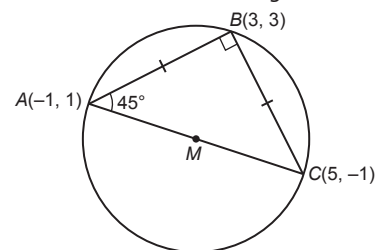
Point M is the midpoint of line AC.

$$M = \left(\frac{-1 + 5}{2}, \frac{1 + (-1)}{2} \right)$$

$$= (2, 0)$$

- (ii) Jejari bulatan ialah panjang bagi BM, AM dan CM.

Radius of the circle is the length of BM, AM and CM.



$$BM = \sqrt{(3 - 2)^2 + (3 - 0)^2}$$

$$= \sqrt{1^2 + 3^2}$$

$$= \sqrt{1 + 9}$$

$$= \sqrt{10}$$

$$= 3.16 \text{ unit / units}$$

- (iii) M ialah titik tengah antara titik B dengan titik D.

M is the midpoint between point B and point D.

Katakan / *Let D(x, y)*

$$\frac{x + 3}{2} = 2$$

$$\frac{y + 3}{2} = 0$$

$$x + 3 = 4$$

$$y + 3 = 0$$

$$x = 4 - 3$$

$$y = -3$$

$$= 1$$

Maka, koordinat lampu isyarat D ialah (1, -3).

Thus, the coordinates of traffic light D is (1, -3).

- (iv) Lilitan bulatan

Circumference of the roundabout

$$= 2\pi r \times 2.5$$

$$= 2 \times \frac{22}{7} \times 3.16 \times 2.5$$

$$= 19.86 \times 2.5$$

$$= 49.65 \text{ m}$$

Power PT3

Bahagian A

1. Hospital = (4, 3)

Balai polis = (-8, -7)

Police station

Kedudukan balai bomba

The position of the fire station

$$= \left(\frac{4 + (-8)}{2}, \frac{3 + (-7)}{2} \right)$$

$$= (-2, -2)$$

Jawapan / *Answer* : C

2. Titik tengah

Midpoint

$$= \left(\frac{-5 + (-5)}{2}, \frac{-3 + 11}{2} \right)$$

$$= (-5, 4)$$

Jawapan / Answer: **B**

3. Jarak

Distance

$$\sqrt{(7-3)^2 + (2p-0)^2} = \sqrt{80}$$

$$\sqrt{4^2 + (2p)^2} = \sqrt{80}$$

$$4^2 + (2p)^2 = 80$$

$$4p^2 = 80 - 16$$

$$p^2 = \frac{64}{4}$$

$$p = \sqrt{16}$$

$$= 4$$

Jawapan / Answer: **B**

4. Jarak di antara R dengan S

The distance between R and S

$$= \sqrt{[3 - (-2)]^2 + (7 - 4)^2}$$

$$= \sqrt{5^2 + 3^2}$$

$$= \sqrt{34}$$

$$= 5.83 \text{ unit / units}$$

Jawapan / Answer: **D**

5. Luas trapezium

Area of trapezium

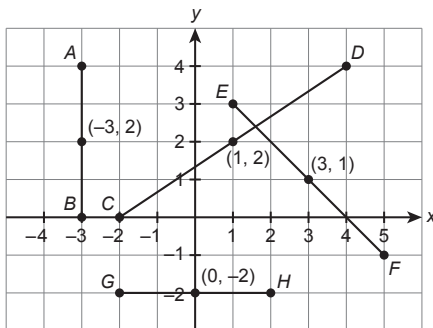
$$= \frac{1}{2} \times (10 + 2) \times 5$$

$$= 30$$

Jawapan / Answer: **B**

Bahagian B

6.



Titik tengah AB

Midpoint of AB

$$= \left(\frac{-3 + (-3)}{2}, \frac{4 + 0}{2} \right)$$

$$= (-3, 2)$$

Titik tengah CD

Midpoint of CD

$$= \left(\frac{-2 + 4}{2}, \frac{0 + 4}{2} \right)$$

$$= (1, 2)$$

Titik tengah EF

Midpoint of EF

$$= \left(\frac{1 + 5}{2}, \frac{3 + (-1)}{2} \right)$$

$$= (3, 1)$$

Titik tengah GH

Midpoint of GH

$$= \left(\frac{-2 + 2}{2}, \frac{-2 + (-2)}{2} \right)$$

$$= (0, -2)$$

7.

Titik P Point P	Titik Q Point Q	Jarak (unit) Distance (units)
(3, 2)	(8, 2)	5
(-4, -6)	(4, -6)	8
(-2, -6)	(-2, 4)	10
(9, 7)	(-3, 12)	13

Jarak antara (3, 2) dengan (8, 2)

Distance between (3, 2) and (8, 2)

$$= \sqrt{(8 - 3)^2 + (2 - 2)^2}$$

$$= \sqrt{5^2}$$

$$= 5$$

Jarak antara (-4, -6) dengan (4, -6)

Distance between (-4, -6) and (4, -6)

$$= \sqrt{[4 - (-4)]^2 + [-6 - (-6)]^2}$$

$$= \sqrt{8^2}$$

$$= 8$$

Jarak antara (-2, -6) dengan (-2, 4)

Distance between (-2, -6) and (-2, 4)

$$= \sqrt{[-2 - (-2)]^2 + [4 - (-6)]^2}$$

$$= \sqrt{10^2}$$

$$= 10$$

Jarak antara (9, 7) dengan (-3, 12)

Distance between (9, 7) and (-3, 12)

$$= \sqrt{(-3 - 9)^2 + (12 - 7)^2}$$

$$= \sqrt{(-12)^2 + (5)^2}$$

$$= \sqrt{144 + 25}$$

$$= \sqrt{169}$$

$$= 13$$



Bahagian C

8. (a) (i) Jarak PQ / Distance of PQ

$$\begin{aligned} &= \sqrt{[3 - (-1)]^2 + [-4 - (-7)]^2} \\ &= \sqrt{16 + 9} \\ &= \sqrt{25} \\ &= 5 \text{ unit / units} \end{aligned}$$

- (ii) $\left(\frac{3+b}{2}, \frac{-6+(-2)}{2}\right) = (-4, a)$

$$\begin{aligned} \frac{-6+(-2)}{2} &= a \\ a &= -4 \end{aligned}$$

$$\begin{aligned} \frac{3+b}{2} &= -4 \\ b &= -11 \end{aligned}$$

$$\begin{aligned} b - \frac{1}{a} &= -11 - \frac{1}{-4} \\ &= -11 + \frac{1}{4} \\ &= -10\frac{3}{4} \end{aligned}$$

- (b) (i) $2 - (-8) = 10 \text{ unit / units}$

- (ii) Jarak antara dewan dengan kantin
The distance between the hall and the canteen

$$\begin{aligned} &= 8 - (-4) \\ &= 12 \text{ unit / units} \\ 1 \text{ unit} &= 50 \text{ m} \\ 12 \text{ unit / units} &= 12 \times 50 \\ &= 600 \text{ m} \\ &= 0.6 \text{ km} \end{aligned}$$

- (iii) Perpustakaan / Library: $(-8, 8)$

Makmal komputer / Computer laboratory:
 $(2, 16)$

$$\begin{aligned} \text{Jarak / Distance} &= \sqrt{(-8 - 2)^2 + (8 - 16)^2} \\ &= \sqrt{(-10)^2 + (-8)^2} \\ &= \sqrt{100 + 64} \\ &= 12.8 \text{ unit / units} \end{aligned}$$

Dewan / Hall: $(2, -4)$

Makmal komputer / Computer laboratory:
 $(2, 16)$

$$\begin{aligned} \text{Jarak / Distance} &= 16 - (-4) \\ &= 20 \text{ unit / units} \end{aligned}$$

Perpustakaan lebih dekat dengan makmal komputer.
The library is nearer to the computer laboratory.

Power KBAT

- (a) $20 \text{ km} = 10 \text{ unit}$

Katakan koordinat balai polis = $(x, 0)$

Let the coordinates of the police station

$$\begin{aligned} (x - 0)^2 + (0 - 6)^2 &= 10^2 \\ x^2 + 36 &= 100 \\ x^2 &= 64 \\ x &= \sqrt{64} \\ &= 8 \end{aligned}$$

Maka, koordinat balai polis ialah $(8, 0)$.

Thus, the coordinates of the police station is $(8, 0)$.

- (b) Jarak di antara pasar raya dengan balai polis

Distance between the supermarket and the police station

$$\begin{aligned} &= \sqrt{(8 - 5)^2 + (0 - 4)^2} \\ &= \sqrt{9 + 16} \\ &= \sqrt{25} \\ &= 5 \text{ unit} \\ &= 5 \times 2 \text{ km} \\ &= 10 \text{ km} \end{aligned}$$