



# Matematik Tambahan

## Modul berfokus

## Geometri Koordinat

**EVERY** successful person has a

**PAINFUL** story

Accept the pain and
get ready for success

**EVERY PAINFUL** story has a

**SUCCESSFUL** ending

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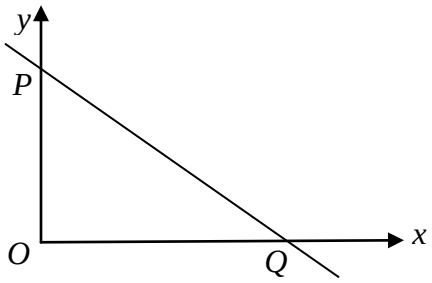
KERTAS 1

1. Titik $T$ membahagi dalam garis lurus yang menghubungkan titik $A(1, -2)$ dan titik $B(-5, 4)$ mengikut nisbah 2 : 1.
Cari koordinat titik $T$.
*Point T divides internally the straight line joining the points* $A(1, -2)$ *and the point* $B(-5, 4)$ *in the ratio* 2 : 1.
*Find the coordinates of point T.*

[2 m / Aras R]

2. Rajah 2 menunjukkan garis lurus $PQ$ dengan persamaan $\frac{x}{3} + \frac{y}{5} = 1$. Titik $Q$ terletak pada paksi-$x$ dan titik $P$ pada paksi-$y$
*Diagram* 2 *shows a straight line PQ with the equation* $\frac{x}{3} + \frac{y}{5} = 1$. *The point Q lies on the x-axis and the point P lies on the y-axis.*




Rajah 2 / *Diagram* 2

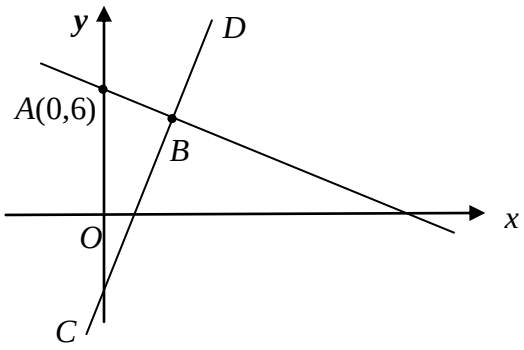
Cari persamaan garis lurus yang berserenjang dengan $PQ$ dan melalui titik $Q$.
*Find the equation of the straight line which is perpendicular to PQ and passes through the point Q.*

[3 m / Aras R ]

3. Garis lurus $8x + 4hy - 6 = 0$ adalah berserenjang dengan garis lurus $3x + y = 16$.
Cari nilai $h$.
*The straight line* $8x + 4hy - 6 = 0$ *is perpendicular to the straight line* $3x + y = 16$.
*Find the value of h.*

[3 m / Aras R]

4. Rajah 4 menunjukkan garis lurus *AB* yang berserenjang dengan garis lurus *CD* pada titik *B*.
*Diagram* 4 *shows the straight line AB which is perpendicular to the straight line CD at the point B.*




Rajah 4/*Diagram* 4

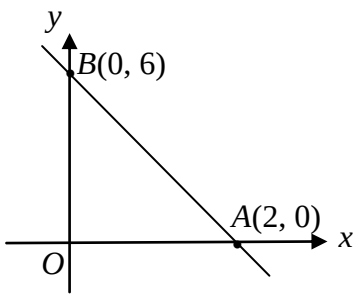
Persamaan garis lurus *CD* ialah $y = 3x - 4$.
Cari koordinat *B*.
*The equation of the straight line CD is* $y = 3x - 4$.
*Find the coordinates of B.*

[3 m / Aras R]

5. Garis lurus $\frac{x}{14} + \frac{y}{m} = 1$ mempunyai pintasan-*y* = 3 dan selari dengan garis lurus $y + nx = 0$.
Tentukan nilai *m* dan *n*.
*The straight line* $\frac{x}{14} + \frac{y}{m} = 1$ *has a y-intercept of* 3 *and is parallel to the straight line* $y + nx = 0$.
*Determine the value of m and of n.*

[3 m / Aras R]

6. Rajah 6 menunjukkan satu garis lurus yang melalui titik A(2, 0) dan B (0, 6).
*Diagram* 6 *shows a straight line which passes through the points A*(2, 0) *and B* (0, 6).




Rajah 6 / *Diagram* 6

(*a*) Tulis persamaan garis lurus *AB* dalam bentuk $\frac{x}{a}+\frac{y}{b}=1$.

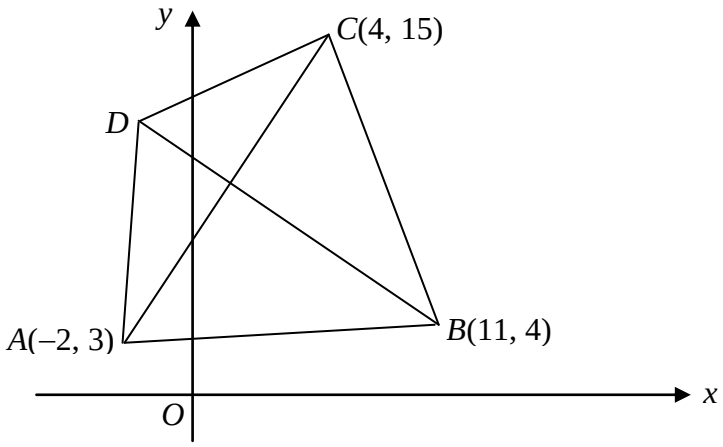
*Write down the equation of the straight line AB in the form* $\frac{x}{a}+\frac{y}{b}=1$.

[1 m / Aras R]

(*b*)` Titik *P*(*x*, *y*) bergerak dengan keadaan *PA* = *PB*.
Cari persamaan bagi lokus P.
*Point P*(*x*, *y*) *moves such that PA = PB.*
*Find the equation of the locus of P.*

[2 m / Aras R]

7. Rajah 7 menunjukkan satu lelayang *ABCD*.
*Diagram* 7 *shows a kite ABCD.*




Rajah 7 / *Diagram* 7

Cari
*Find*

(*a*) koordinat titik tengah pepenjuru *AC*.
*the coordinates of the midpoint of diagonal AC.*

(*b*) persamaan pepenjuru *BD* .
*the equation of diagonal BD.*

[4 m / Aras S]

8. Suatu garis lurus melalui titik $A(-2,-5)$ dan $B(6,7)$.
*A straight line passes through the points* $A(-2,-5)$ *and* $B(6,7)$.

(*a*) Titik $D$ membahagikan dalam tembereng garis $AB$ dalam nisbah $1:3$.
Cari koordinat $D$.
*Point* $D$ *divides the line segment* $AB$ *internally in the ratio* $1:3$.
*Find the coordinates of D.*

[2 m / Aras R]

(*b*) Diberi titik $C(h,10)$ terletak di atas garis lurus $AB$, cari nilai $h$.
*Given that the point* $C(h,10)$ *lies on the straight line AB, find the value of* $h$.

[2 m / Aras S]

9. Titik $P$ bergerak dengan keadaan jaraknya sentiasa $5$ unit dari titik $Q(-3, 4)$.
Cari persamaan bagi lokus $P$.
*Point* $P$ *moves such that its distance is always* $5$ *units from point* $Q(-3, 4)$.
*Find the equation of the locus of* $P$.

[3 m / Aras R]

10. $A(0, 3)$, $B(2, t)$ dan $C(-2, -1)$ ialah bucu-bucu segi tiga $ABC$.
Diberi luas segi tiga $ABC$ ialah $4$ unit$^2$, cari nilai $t$ yang mungkin.
$A(0, 3)$, $B(2, t)$ *and* $C(-2, -1)$ *are the vertices of triangle ABC.*
*Given that the area of triangle ABC is* $4$ *unit*$^2$, *find the possible values of* $t$.

[3 m / Aras S]

11. $A(2, 2)$, $B(5, 3)$, $C(4, -1)$ dan $D(p, q)$ ialah bucu-bucu sebuah segi empat selari.
$A(2, 2)$, $B(5, 3)$, $C(4, -1)$ *and* $D(p, q)$ *are the vertices of a parallelogram*.
Cari
*Find*

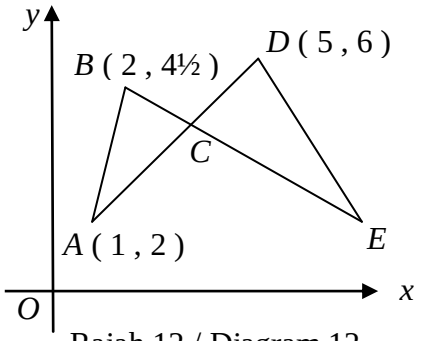
(*a*) nilai $p$ dan nilai $q$.
*the value of p and of q.*

[2 m / Aras S]

(*b*) luas $ABCD$.
*the area of ABCD.*

[2 m / Aras R]

12. Dalam Rajah 12, *ACD* dan *BCE* ialah garis lurus. *C* ialah titik tengah *AD* dan *BC* : *BE* = 1 : 5.
*In Diagram* 12, *ACD and BCE are straight lines. C is the midpoint of AD and BC : BE* = 1 : 5.




Rajah 12 / Diagram 12

Cari
*Find*

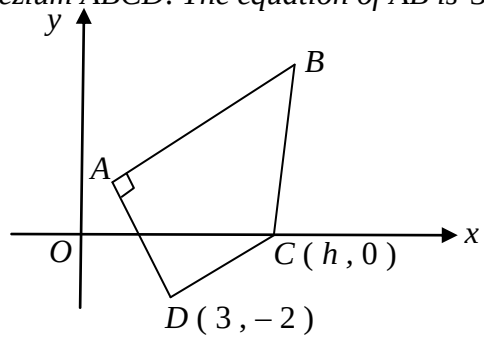
(*a*) koordinat titik *C*.
*the coordinates of point C.*

[2 m / Aras R]

(*b*) koordinat titik *E*.
*the coordinates of point E.*

[2 m / Aras S]

13. Rajah 13 menunjukkan sebuah trapezium *ABCD* . Persamaan *AB* ialah $3y - 2x - 1 = 0$.
*Diagram 13 shows a trapezium ABCD. The equation of AB is* $3y - 2x - 1 = 0$.




Rajah 13 / Diagram 13

Cari
*Find*

(*a*) nilai *h*.
*the value of h.*

[2 m / Aras S]

(*b*) persamaan *AD*.
*the equation of AD.*

[2 m / Aras S]

14. Garis lurus $y = 4x - 6$ memotong lengkung $y = x^2 - x - 2$ pada titik *P* dan titik *Q*. Hitung koordinat bagi titik tengah *PQ*.
*The straight line* $y = 4x - 6$ *intersects the curve* $y = x^2 - x - 2$ *at the points P and Q. Calculate the coordinates of the midpoint of PQ*.

[4 m / Aras T]

15. *E*(– 1 , 0 ) dan *F*( 2 , 6 ) adalah dua titik tetap dan titik *S* bergerak dengan keadaan 2*SE* = *SF*.
*E*(– 1 , 0 ) *and F*( 2 , 6 ) *are two fixed points and point S moves such that* 2*SE* = *SF*.
Cari
*Find*

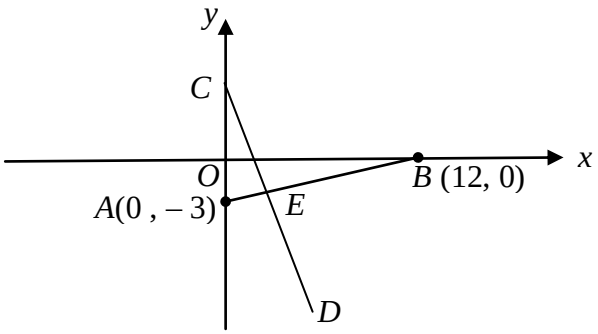
(*a*) persamaan bagi lokus *S*.
*the equation of the locus of S.*

(*b*) koordinat titik-titik di mana lokus *S* bertemu dengan paksi-*y*
*the coordinates of the points where the locus of S meets the y-axis.*

[ 4 m / Aras T]

KERTAS 2

1. Rajah 1 menunjukkan garis lurus *CD* bertemu garis lurus *AB* di titik *E*. Titik *C* terletak pada paksi-*y*.
*Diagram* 1 *shows straight line CD which meets straight line AB at the point E. Point C lies on the y-axis.*




Rajah 1 / *Diagram* 1

(*a*) Tulis persamaan *AB* dalam bentuk pintasan.
*Write down the equation of AB in the form of intercepts.*

[1 m / Aras R]

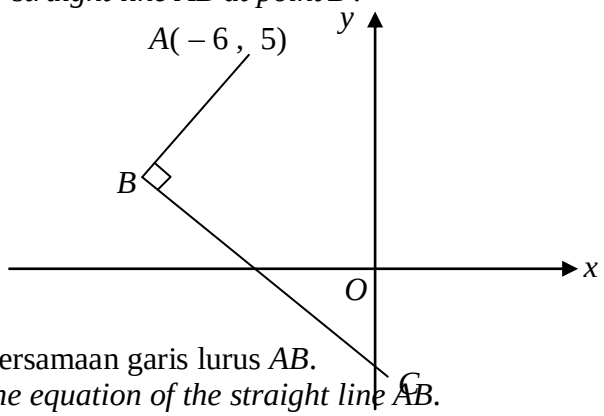
(*b*) Diberi 2*AE* = *EB* , cari koordinat *E*.
*Given that* 2*AE* = *EB, find the coordinates of E.*

[2 m / Aras R]

(*c*) Diberi *CD* adalah berserenjang dengan *AB*, cari pintasan-*y* bagi *CD* .
*Given that CD is perpendicular to AB, find the y-intercept of CD.*

[3 m / Aras R]

2. Dalam Rajah 2, garis lurus *BC* mempunyai persamaan $3y + x + 6 = 0$ dan berserenjang dengan garis lurus *AB* pada titik *B* .
*In Diagram* 2, *the straight line BC has an equation of* $3y + x + 6 = 0$ *and is perpendicular to straight line AB at point B* .




Rajah 2 / *Diagram* 2

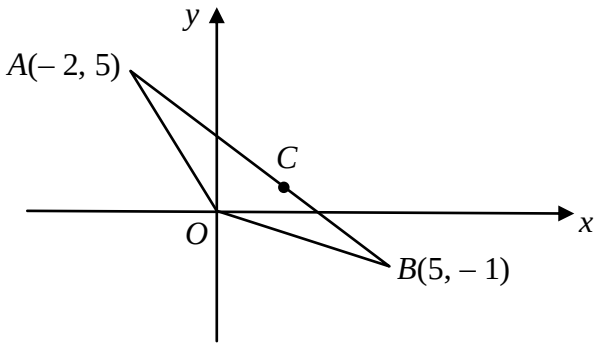
(*a*) Cari
*Find*
(i) persamaan garis lurus *AB*.
*the equation of the straight line AB.*
[3 m / Aras R]

(ii) koordinat *B.*
*the coordinates of B.*
[3 m / Aras R]

(*b*) Garis lurus *AB* dipanjangkan ke titik *D* dengan keadaan *AB* : *BD* = 2 : 3.
Cari koordinat *D.*
*The straight line AB is extended to point D such that AB* : *BD* = 2 : 3.
*Find the coordinates of D.*
[2 m / Aras R]

(*c*) Titik *P* bergerak dengan keadaan jaraknya dari titik *A* sentiasa 5 unit.
Cari persamaan bagi lokus *P*.
*Point P moves such that its distance from point A is always* 5 *units.*
*Find the equation of the locus of P.*
[3 m / Aras R]

3. Rajah 3 menunjukkan segitiga *AOB* di mana *O* adalah asalan . Titik *C* terletak pada garis lurus *AB.*
*Diagram* 3 *shows a triangle AOB where O is the origin. Point C lies on the straight line AB.*




Rajah 3 / *Diagram* 3

(*a*) Hitung luas, dalam unit$^2$, bagi segitiga *AOB.*
*Calculate the area, in unit* $^2$*, of triangle AOB.*

[2 m / Aras R]

(*b*) Diberi *AC* : *CB* = 3 : 2, cari koordinat *C.*
*Given that AC : CB* = 3 : 2, *find the coordinates of C.*

[2 m / Aras R]

(*c*) Titik *P* bergerak dengan keadaan jaraknya dari titik *A* sentiasa dua kali jaraknya dari titik *B.*
*A point P moves such that its distance from point A is always twice its distance from point B.*

(i) Cari persamaan bagi lokus *P.*
*Find the equation of the locus of P.*

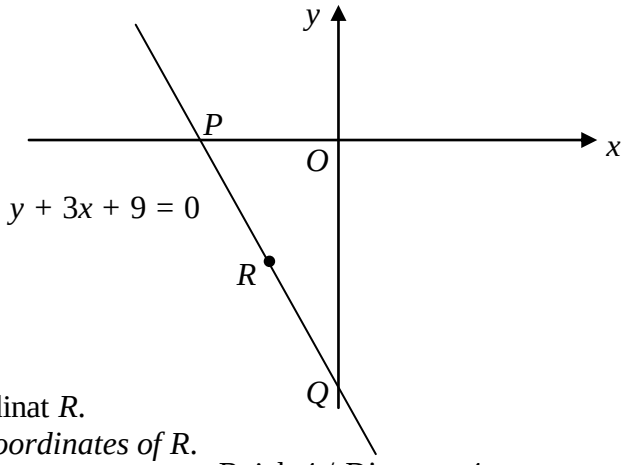
[3 m / Aras S]

(ii) Seterusnya , tentukan sama ada lokus *P* memintas paksi–*y.*
*Hence, determine whether the locus of P intersects the y*-axis.

[3 m / Aras T]

4. Rajah 4 menunjukkan garis lurus $PQ$ dengan persamaan $y+3x+9=0$. $PQ$ bersilang dengan paksi $-x$ pada titik $P$ dan paksi $-y$ pada titik $Q$. Titik $R$ terletak pada $PQ$ dengan keadaan $PR : RQ = 1 : 2$.

*Diagram* 4 shows a *straight line PQ with an equation of* $y+3x+9=0$. *PQ intersects the x-axis at point P and the y-axis at point Q. Point R lies on PQ such that PR : RQ* = 1 : 2.




Rajah 4 / *Diagram* 4

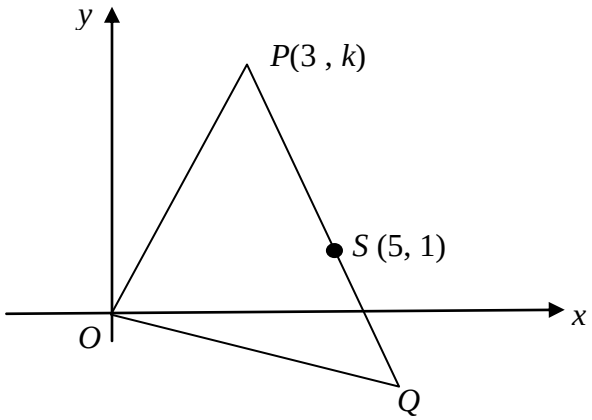
Cari
*Find*

(*a*) koordinat *R*.
*the coordinates of R.* [ 3 m / Aras R]

(*b*) persamaan garis lurus yang melalui titik *R* dan berserejang dengan *PQ*.
*the equation of the straight line that passes through point R and perpendicular to PQ.*

[ 3 m / Aras R]

5. Rajah 5 menunjukkan segitiga *OPQ* dilukis pada satah Cartesan. Titik *S* terletak pada garis *PQ*.
*Diagram* 5 *shows a triangle OPQ drawn on the Cartesian plane. Point S lies on the line PQ.*




Rajah 5 / *Diagram* 5

(*a*) Titik *W* bergerak dengan keadaan jaraknya dari titik *S* sentiasa $2\frac{1}{2}$ unit.
Cari persamaan bagi lokus *W*.
*A point W moves such that its distance from point S is always* $2\frac{1}{2}$ *units.*
*Find the equation of the locus of W.*

[3 m / Aras R]

(*b*) Diberi bahawa titik *P* dan titik *Q* terletak pada lokus *W*.
*It is given that point P and point Q lie on the locus of W.*
Hitung
*Calculate*
(i) nilai *k*.
*the value of k.*

[3 m / Aras S]

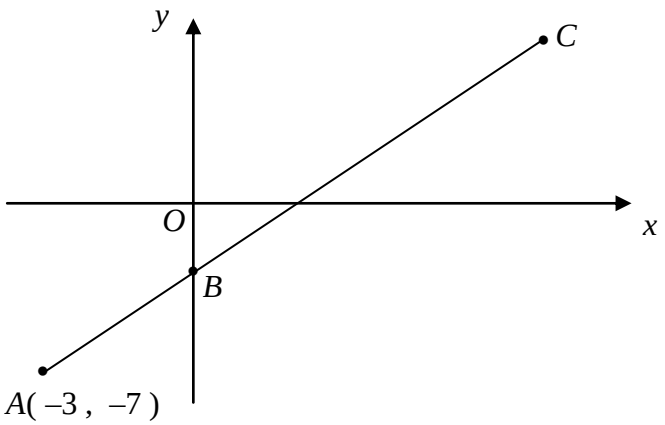
(ii) koordinat *Q*.
*the coordinates of Q.*

[2 m / Aras S]

(*c*) Seterusnya, cari luas, dalam unit$^2$, bagi segitiga *OPQ*.
*Hence, find the area, in unit* $^2$*, of triangle OPQ.*

[2 m / Aras R]

6. Rajah 6 menunjukkan garis lurus *AC* yang menyilang paksi-*y* pada titik *B*. Persamaan *AC* ialah $3y = 2x - 15$.
*Diagram* 6 *shows straight line AC which intersects the y-axis at point B. The equation of AC is* $3y = 2x - 15$.




Rajah 6 / *Diagram* 6

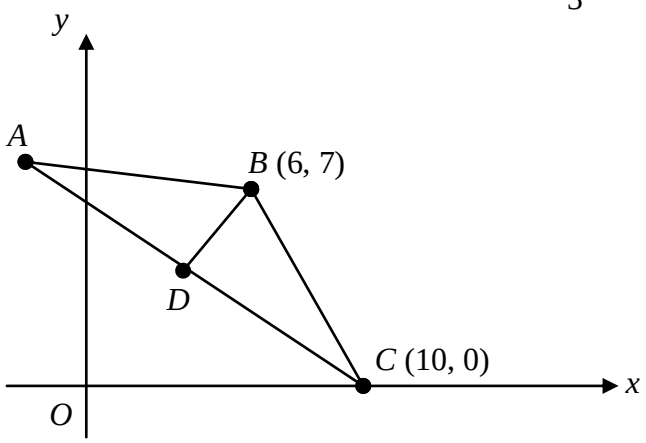
Cari
*Find*

(*a*) persamaan garis lurus yang melalui titik *A* dan berserenjang dengan *AC*.
*equation of the line which passes through point A and perpendicular to AC.*
[4 m / Aras S]

(*b*) koordinat *B*.
*coordinates of B.*
[1 m / Aras R]

(*c*) koordinat *C* diberi *AB* : *AC* = 2 : 9.
*coordinates of C given that AB* : *AC* = 2 : 9.
[3 *m* / Aras *S*]

7. Rajah 7 menunjukkan satu segi tiga sama kaki *ABC* dengan keadaan *AB = BC.* Garis lurus *BD* berserenjang dengan garis lurus *AC* dan kecerunan garis lurus *AC* = $-\frac{2}{3}$.
*Diagram* 7 *shows an isosceles triangle ABC such that AB = BC. Straight line BD is perpendicular to straight line AC and the gradient of AC* = $-\frac{2}{3}$.




Rajah 7 / *Diagram* 7

Cari
*Find*

(*a*) pintasan-*y* garis lurus *AC*.
*y-intercept of straight line AC.*

[1 m / Aras R]

(*b*) persamaan garis lurus *BD*.
*equation of straight line BD.*

[3 m / Aras R]

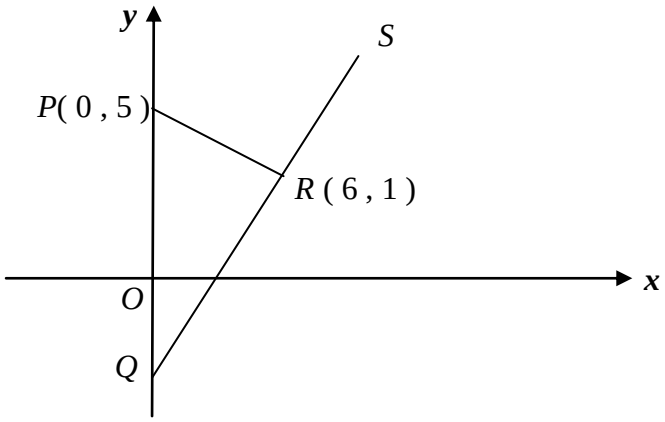
(*c*) koordinat titik *A*.
*coordinates of point A.*

[4 m / Aras T]

(*d*) luas segi tiga *ABC*.
*area of triangle ABC.*

[2 m / Aras R]

8. Rajah 8 menunjukkan garis lurus *PR* bersilang dengan garis lurus *QS* pada titik *R*(6,1). Garis lurus *PR* adalah berserenjang dengan garis lurus *QS*.
*Diagram* 8 *shows straight line PR intersecting straight line QS at the point R*(6,1). *Straight line PR is perpendicular to straight line QS.*




Rajah 8/ *Diagram* 8

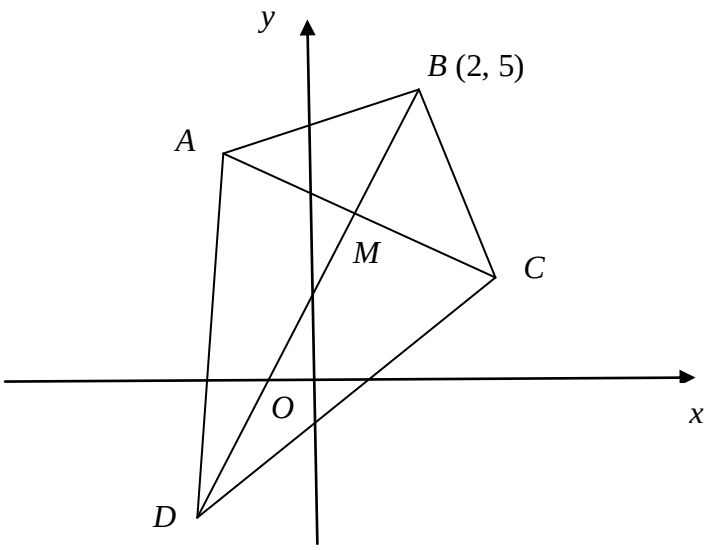
(*a*) Cari persamaan garis lurus *QS*.
*Find the equation of straight line QS.*

[3 m / Aras S]

(*b*) Titik *R* membahagi dalam garis lurus *QS* mengikut nisbah *QR* : *RS* = 2: 1.
Cari koordinat *S*.
*Point R divides internally straight line QS in the ratio QR* : *RS* = 2: 1.
*Find the coordinates of S.*

[2 m / Aras R]

9. Rajah 9 menunjukkan sebuah lelayang *ABCD*. Pepenjuru-pepenjuru *AC* dan *BD* bersilang pada titik *M*. Persamaan *AC* ialah $x + 2y = 7$ dan $BM : MD = 1 : 2$.
*Diagram* 9 *shows a kite ABCD. The diagonals AC and BD intersect at point M. The equation of AC is* $x + 2y = 7$ *and* $BM : MD = 1 : 2$.




Rajah 9 / *Diagram* 9

(*a*) Cari
*Find*

(i) persamaan pepenjuru *BD*.
*the equation of diagonal BD.*

[3 m / Aras S]

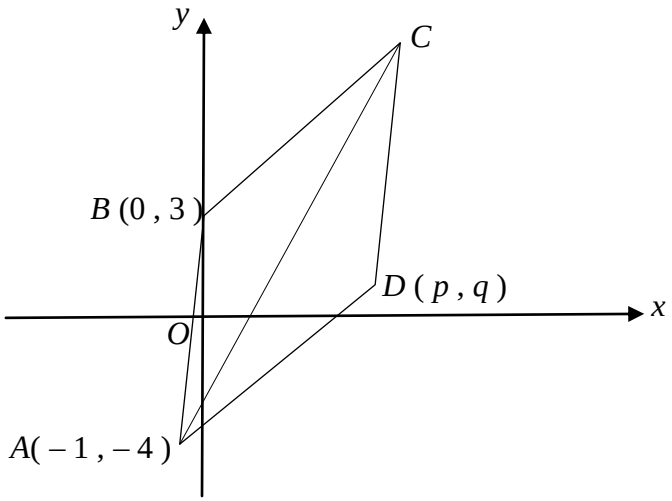
(ii) koordinat titik *M* dan titik *D*.
*coordinates of point M and point D.*

[4 m / Aras T]

(*b*) Titik *P* (*x*, *y*) bergerak pada satah Cartesan dengan keadaan *PM = MD*.
Cari persamaan bagi lokus *P*.
*Point P* (*x*, *y*) *moves in the Cartesian plane such that PM = MD.*
*Find the equation of the locus of P.*

[3 m / Aras R]

10. Rajah 10 menunjukkan sebuah rombus *ABCD* dilukis pada satah Cartesan. Persamaan pepenjuru *AC* ialah $y - 2x + 2 = 0$.
*Diagram* 10 *shows a rhombus ABCD drawn on the Cartesian plane. The equation of diagonal AC is* $y - 2x + 2 = 0$.




Rajah 10 /*Diagram* 10

(*a*) Cari persamaan yang menghubungkan *p* dan *q* dengan menggunakan kecerunan.
*Find the equation relating p and q by using gradient*.

[3 m /Aras S]

(*b*) Diberi bahawa luas rombus *ABCD* ialah 30 unit$^2$, cari koordinat bucu *D*.
*Given that the area of rhombus ABCD is* 30 unit$^2$, *find the coordinates of vertex D.*

[5 m /Aras T]

(*c*) Seterusnya, cari koordinat bucu *C*.
*Hence, find the coordinates of vertex C.*

[2 m /Aras T]

**JAWAPAN : MODUL 6 : BAB : GEOMETRI KOORDINAT**

**KERTAS 1**

1. $T(-3, 2)$

2. $5y = 3x - 9$

3. $h = -6$

4. $B(3, 5)$

5. $m = 3,\ n = \frac{3}{14}$

6. (a) $\frac{x}{2} + \frac{y}{6} = 1$
   (b) $3y - x - 8 = 0$

7. (a) $(1, 9)$
   (b) $2y = -x + 19$

8. (a) $D(0, -2)$
   (b) $h = 8$

9. $x^2 + y^2 + 6x - 8y = 0$

10. $t = 3, 11$

11. (a) $p = 1,\ q = -2$
    (b) $11 \text{ unit}^2$

12. (a) $C(3, 4)$
    (b) $E(7, 2)$

13. (a) $h = 6$
    (b) $3x + 2y = 5$

14. $(2\frac{1}{2}, 4)$

15. (a) $x^2 + y^2 + 4x + 4y - 12 = 0$
    (b) $(0, -6), (0, 2)$

**KERTAS 2**

1. (a) $\frac{x}{12} - \frac{y}{3} = 1$
   (b) $(4, -2)$
   (c) $14$

2. (a)(i) $y = 3x + 23$
   (ii) $B(-\frac{15}{2}, \frac{1}{2})$
   (b) $D(-\frac{39}{4}, -\frac{25}{4})$
   (c) $x^2 + y^2 + 12x - 10y + 36 = 0$

3. (a) $\frac{23}{2} \text{ unit}^2$
   (b) $C(\frac{11}{5}, \frac{7}{5})$
   (c)(i) $3x^2 + 3y^2 - 44x + 18y + 75 = 0$
   (c)(ii) Tidak

4. (a) $R(-2, -3)$
   (b) $3y = x - 7$

5. (a) $4x^2 + 4y^2 - 40x - 8y + 79 = 0$
   (b)(i) $k = \frac{5}{2}$
   (ii) $Q(7, -\frac{1}{2})$
   (c) $\frac{19}{2} \text{unit}^2$

6. (a) $3x + 2y + 23 = 0$
   (b) $B(0, -5)$
   (c) $C(\frac{21}{2}, 2)$