RS Aggarwal Solutions for Class 10 Maths Chapter 16 Exercise 16.2: RS Aggarwal Solutions for Class 10 Maths Chapter 16, Exercise 16.2 provide detailed answers and explanations for problems related to Coordinate Geometry. This exercise focuses on applying concepts such as the distance formula, midpoint theorem, and section formula to solve a variety of coordinate geometry problems.

By working through this exercise, students can enhance their problem-solving skills, solidify their understanding of key concepts and prepare effectively for their exams.

RS Aggarwal Solutions for Class 10 Maths Chapter 16 Exercise 16.2 Overview

RS Aggarwal Solutions for Class 10 Maths Chapter 16 Exercise 16.2 are created by experts from Physics Wallah. This exercise helps students understand Coordinate Geometry by solving problems with clear, step-by-step solutions.

The experts explain how to use important formulas like the distance formula, midpoint theorem, and section formula. These solutions make it easier for students to learn and apply these concepts, which is very useful for preparing for exams.

RS Aggarwal Solutions for Class 10 Maths Chapter 16 Exercise 16.2 PDF

The PDF link for RS Aggarwal Solutions for Class 10 Maths Chapter 16 Exercise 16.2 is available below.

By downloading this PDF, students can access expert-prepared solutions and improve their problem-solving skills making it a valuable resource for their exam preparation.

RS Aggarwal Solutions for Class 10 Maths Chapter 16 Exercise 16.2 PDF

RS Aggarwal Solutions for Class 10 Maths Chapter 16 Exercise 16.2

Here we have provided the RS Aggarwal Solutions for Class 10 Maths Chapter 16 Coordinate Geometry Exercise 16.2 to help students prepare better for their exams. These solutions are designed to make it easier for students to understand and practice key concepts in Coordinate Geometry ensuring they are well-prepared and confident for their upcoming tests.

Q. If the coordinates of points A and B are (-2, -2) and (2, -4) respectively, find the coordinates of the point P such that AP = 37 AB, where P lies on the line segment AB.

Solution:

The coordinates of the points A and B are (-2,-2) and (2,-4) respectively where AP=37AB and P lies on the line segment AB. So

AP+BP=AB

⇒ AP+BP=7AP3AB (∵AP=37AB)

⇒ BP=7AP3−AP=4AP3

⇒ APBP=34

Let (x,y) be the coordinates of P which divides AB in the ratio 3:4 internally. Then

Therefore, (x1=−2,y1=−2) and (x2=2,y2=−4)

Also, m = 3 and n = 4

Let the required point be P(x,y)

By section formula, we get

x = (mx2+nx1m+n,y=my2+ny1m+n)

⇒x=(3×2)+(4×−2)3+4
⇒x=6−87
⇒x=−27
⇒y=(3×−4)+(4×−2)3+4
⇒y=−12−87
⇒y=−207

Hence, the coordinates of the point P are (−27,−207)

Q. Point A lies on the line segment PQ joining P(6, -6) and Q(-4, -1) in such a way that PAPQ=25. If the point A also lies on the line 3x+k(y+1) = 0, find the value of k.

Solution:

Point A divides PQ in the ratio of 2:3 internally . so coordinates of A are ;

A= (2(−4)+3(6)(2+3) ,2(−1)+3(−6)(2+3))

A=(2,-4)

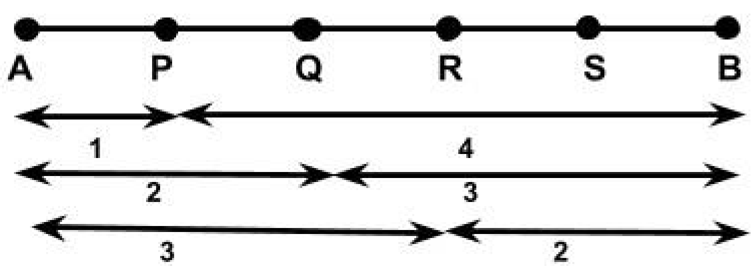
if A lies on 3x+k(y+1) = 0, Then 3(2)+k(-4+1)=0

6+k(-3)=0

k=2

Q. Points P, Q, R and S divide the line segment joining the points A (1, 2) and B(6, 7) into five equal parts. Find the coordinates of the points P, Q and R.

Solution:



P divides AB in the ratio is 1:4

Coordinates of P using section formula,

using Section Formula given by.

Here m = 1 and n = 4, = 6, = 1, = 7, = 2

Coordinates of P (2,3).

Q divides AB in the ratio is 2:3

Coordinates of Q

Coordinates of Q are (3,4)

R divides AB in the ratio is 3:2

Coordinates of R are

Coordinates of R are (4,5)

Q. The line segment joining the points A (3, -4) and B (1, 2) is trisected at the points P(p, -2) and Q (53, q). Find the values of p and q.

Solution:

We know that a ratio m:n divides with coordinates ∴P(x,y)=(mx2+nx1m+n,my2+ny1m+n)

Here trisection points are P(p, -2) and Q (53,q) and points are A (3, -4) and B (1, 2). Trisection can occur in either 1:2 or 2:1 ratio. But we don't know which point (P or Q) trisects in which ratio.

lets think P divides in m:n ratio and so

y=my2+ny1m+n−2=2m+(−4)nm+n)−2(m+n)=2m−4n−2m−2n=2m−4n−4m=−2nmn=24=12

So P divides in the ratio 1:2

now p=mx2+nx1m+n=1×1+2×33=1+63=73

now for Q,

53=mx2+nx1m+n53=m+3nm+n5m+5n=3m+9n2m=4nfracmn=42=21

So Q divides in the ratio 2:1

So,

q=my2+ny1m+n=2×2+1×−43=4−43=0

value of p=73 and q = 0

Q. Find the coordinates of the midpoint of the line segment joining

(i) A(3, 0) and B(-5, 4) (ii) P(-11, -8) and Q(8, -2).

Solution:

(i) A(3,0) and B(-5, 4)

$x=3-52=-22=-1$

$y=0+42=2$
point (-1,2)

(ii) P(-11, -8) and Q(8, -2)

$x=-11+82=-32$

$y=-8-22=-102=-5$

Q. If (2, p) is the midpoint of the line segment joining the points A(6, -5) and B(-2, 11), find the value of p.

Solution:

A(6, -5) and B(-2, 11)

here mid point
$x=6-22=2$
$y=-5+112=3$

so(2,p)=2,3
so p=3

Q. In what ratio does the point P(2, 5) divide the join of A(8, 2) and B (-6, 9) ?

Solution:

Q. In what ratio does the line x-y-2 = 0 divide the line segment joining the points A(3, -1) and B(8, 9) ?

Solution:

Let the line x−y–2=0 divide the line segment joining the points A(3,-1) and B(8,9) in the ratio k:1 at P

Then, by section formula the coordinates of P are

x=(mx2+nx1m+n,y=my2+ny1m+n)

P = x=8k+3k+1,y=9k−1k+1

Since, P lies on the line x−y−2=0, we have.

(8k+3k+1)−(9k−1k+1)−2=0

⇒ 8k+3–9k+1–2k−2=0

⇒8k–9k−2k+3+1–2=0

$\Rightarrow -3k+2=0$

$\Rightarrow -3k=-2$

$\Rightarrow k=23$

So, the required ratio is 23:1, which is equal to 2 : 3

Q. Find the lengths of the medians of a △ABC whose vertices are A(0, -1), B(2, 1) and C(0, 3)?

Solution:

Let D be the midpoint of BC. So, the coordinates of D are

$D=(2+0)2,(1+3)2.$

$\Rightarrow D=22,42$

$D=(1,2)$

Let E be the midpoint of AC. So, the coordinates of E are

$E=(0+0)2,(-1+3)2$

$E=(02,22$

$= E(0,1)$

Let F be the midpoint of AB. So, the coordinates of F are

$F=(0+2)2,(-1+1)2$

$F=22,02$

$= F(1,0)$

$AD=\surd(1-0)2+(2-(-1))2$

$AD=(1)2+(3)2$

$AD=\surd 1+9$

$AD=\surd 10$ units

$BE=\surd(0-2)2+(1-1)2$

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

$BE=\sqrt{4+0}$

BE= 2 units

$CF=\sqrt{(1-0)^2+(0-3)^2}$

$CF=\sqrt{(1)^2+(-3)^2}$

$CF=\sqrt{1+9}$

$CF=\sqrt{10}$ units

Therefore, the lengths of the medians: $AD=\sqrt{10}$ units, $BE=2$ units, $CF=\sqrt{10}$ units

Q. Find the third vertex of a △ABC if two of its vertices are B(-3, 1) and C(0, -2), and its centroid is at the origin.

Solution:

Centroid $(X,Y)=\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}$

$\Rightarrow (0,0)=\frac{-3+0+x_3}{3},\frac{1-2+y_3}{3}$

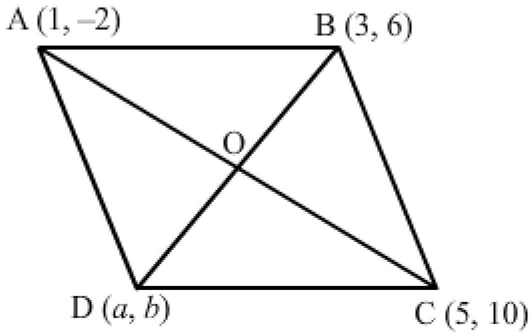
Solving, we get $x_3=3$ and $y_3=1$

Q. If three consecutive vertices of a parallelogram ABCD areA(1, -2), B(3, 6) and C(5, 10), find its fourth vertex D.

Solution:

Let A (1, -2), B (3, 6), C (5, 10) be the three vertices of a parallelogram ABCD and the fourth vertex be D (a, b)

Join AC and BD, intersecting at O



We know that the diagonals of a parallelogram bisect each other

Therefore, O is the midpoint of AC as well as BD

Midpoint of AC = (1+52,−2+102)

= (62,82)

= (3, 4)

Midpoint of BD = (3+a2,6+b2)

Therefore, 3+a2=3,6+b2=4

⇒ 3 + a = 6 , 6 + b = 8

⇒ a = 6 - 3, b = 8 - 6

⇒ a = 3 and b = 2

Therefore, the fourth vertex is D (3,2)

Q. In what ratio does y-axis divide the line segment joining the points (-4, 7) and (3, -7)?

Solution:

Q. ABCD is a rectangle formed by the points A(-1, -1), B(-1, 4), C(5, 4) and D(5, -1). If P, Q, R and S be the midpoints of AB, BC, CD and DA respectively, show that PQRS is a rhombus.

Solution:

Here, the points P, Q, R and S are the mid-points of AB, BC, CD and DA respectively. Then

The points are A(-1, -1), B(-1, 4), C(5, 4) and D(5, -1)

Co-ordinates of P $=(-1-12,-1+42)=(-1,32)$

Co-ordinates of Q $=(-1+52,4+42)=(2,4)$

Co-ordinates of R =(5+52,4−12)=(5,32)

Co-ordinates of S =(−1+52,−1−12)=(2,−1)

Now,

PQ=√(2+1)2+(4−32)2=√9+254=√612

QR=√(5−2)2+(32−4)2=√9+254=√612

RS=√(5−2)2+(32+1)2=√9+254=√612

SP=√(2+1)2+(−1−32)2=√9+254=√612

PR=√(5+1)2+(32−32)2=√36=6

QS=√(2−2)2+(−1−4)2=√25=5

Thus PQ=QR=RS=SP and PR≠QS.

Therefore PQRS is a rhombus

Q. Find all possible values of x for which the distance between the points

A (x, -1) and B (5, 3) is 5 units.

Solution:

We know that the distance between two points (x1,y1) and (x2,y2) ,

d=√(x2−x1)2+(y2−y1)2

Given d = 5 units and points are A (x, -1) and B (5, 3)

∴√(5−x)2+(3−−1)2=5

(5−x)2+(3+1)2=25

(5−x)2+16=25

(5−x)2=25−16

(5−x)2=9

(5−x)=√9

(5−x)=±3

$x=5\pm3$

$x=5+3$ or $5-3$

$x=8$ or 2

Q. If the point A (x, 2) is equidistant from the points B(8, -2) and C(2, -2) find the value of x. Also, find the length of AB.

Solution:

As per the question, we have
AB=AC
$\sqrt{x-8)2+(2+2)2}=\sqrt{(x-2)2+(2+2)2}$

$\sqrt{x2+64-16\times x+16}=\sqrt{x2+4-4\times x+16}$

$\sqrt{x2-16\times x+80}=\sqrt{x2-4\times x+20}$

squaring both sides we get

$x2-16x+80=x2-4x+20$

$80-20=-4x+16x$
$80-20=-4x+16x$
$x=5$

$AB=\sqrt{(x-8)2+(2+2)2}$
$\sqrt{(5-8)2+(4)2}$
$=\sqrt{9+16}=\sqrt{25}$ = \pm5 \)

hence AB=5

Q. Show that the following points are the vertices of a square:

(i) A(3, 2), B (0, 5), C(-3, 2) and D(0, -1)
(ii) A(6, 2), B(2, 1), C(1, 5) and D(5, 6)
(iii) A(0, -2), B(3, 1), C(0, 4) and D(-3, 1)

Solution:

(i)The given points are A (3,2), B(0,5) and C(-3,2), D(0,-1). Then

AB =√(0−3)2+(5−2)2

= √(−3)2+(3)2

=√9+9

= √18

=3√2 units

BC =√(−3−0)2+(2−5)2

= √(−3)2+(−3)2

= √9+9

= √18

=3√2 units

CD = √(0+3)2+(−1−2)2

= √(3)2+(−3)2

= √9+9

=√18

=3√2 units

DA = √(0−3)2+(−1−2)2

=√(−3)2+(−3)2

= √9+9

=√18

=3√2 units

Therefore AB = BC = CD = DA =3√2 units

Also,

AC =√(−3−3)2+(2−2)2

=√(−6)2+(0)2

=√36

= 6 units

BD =√(0−0)2+(−1−5)2

=√(0)2+(−6)2

=√36

= 6 units

Thus, diagonal AC = diagonal BD

Therefore, the given points form a square.

(ii) A(6, 2), B(2, 1), C(1, 5) and D(5, 6)

Solution

The given points are A (6,2), B(2,1) and C(1,5), D(5,6). Then

AB=√(2−6)2+(1−2)2

=√(−4)2+(−1)2

=√16+1

=√17 units

BC=√(1−2)2+(5−1)2

=√(−1)2+(−4)2

=√1+16

=√17 units

CD=√(5−1)2+(6−5)2

=√(4)2+(1)2

=√16+1

=√17units

DA=√(5−6)2+(6−2)2

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

$=\sqrt{1+16}$

$=\sqrt{17}$ units

Therefore $AB=BC=CD=DA=\sqrt{17}$ units

Also,
$AC=\sqrt{(1-6)^2+(5-2)^2}$

$=\sqrt{(-5)^2+(3)^2}$

$=\sqrt{25+9}$

$=\sqrt{34}$units

$BD=\sqrt{(5-2)^2+(6-1)^2}$

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

$=\sqrt{9+25}$

$=\sqrt{34}$ units

Thus, diagonal AC = diagonal BD

Therefore, the given points form a square.

(iii)A(0, -2), B (3, 1), C (0, 4) and D (-3, 1)

Solution

The given points are P (0,-2), Q(3,1) and R(0,4), S(-3,1). Then

$PQ=\sqrt{(3-0)^2+(1+2)^2}$

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

$=\sqrt{9+9}$

$=\sqrt{18}$

$=3\sqrt{2}$units

$QR=\sqrt{(0-3)^2+(4-1)^2}$

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

$=\sqrt{9+9}$

$=\sqrt{18}$

$=3\sqrt{2}$units

$RS=\sqrt{(-3-0)2+(1-4)2}$

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

$=\sqrt{9+9}$

$=\sqrt{18}$

$=3\sqrt{2}$units

$SP=\sqrt{(-3-0)2+(1+2)2}$

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

$==\sqrt{9+9}$

$=\sqrt{18}$

$=3\sqrt{2}$units

Therefore PQ = QR = RS = SP $=3\sqrt{2}$units

Also,
$PR=\sqrt{(0-0)2+(4+2)2}$

$=\sqrt{(0)2+(6)2}$

$=\sqrt{36}$

= 6 units

$QS=\sqrt{(-3-3)2+(1-1)2}$

$=\sqrt{(-6)2+(0)2}$

$=\sqrt{36}$

= 6 units

Thus, diagonal PR = diagonal QS

Therefore, the given points form a square.

Benefits of RS Aggarwal Solutions for Class 10 Maths Chapter 16 Exercise 16.2

- **Detailed Explanations:** Each solution is explained step-by-step making it easier for students to understand the process of solving Coordinate Geometry problems.
- **Concept Reinforcement:** The exercise focuses on applying important concepts such as the distance formula, midpoint theorem, and section formula, helping to reinforce these key ideas.
- **Error Correction:** By following the detailed solutions students can learn from their mistakes and understand where they went wrong leading to better accuracy in their work.
- **Improved Accuracy:** With clear explanations and methods, students can improve their accuracy in solving Coordinate Geometry problems and avoid common mistakes.