

Co-Ordinate Geometry Ex 14.2 Q28

Answer:

The distance d between two points (x_1, y_1) and (x_2, y_2) is given by the formula

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

Here we are to find out a point on the x-axis which is equidistant from both the points A(7,6) and B(-3,4).

Let this point be denoted as C(x, y).

Since the point lies on the x-axis the value of its ordinate will be 0. Or in other words we have y = 0.

Now let us find out the distances from 'A' and 'B' to 'C'

$$AC = \sqrt{(7-x)^2 + (6-y)^2}$$

$$= \sqrt{(7-x)^2 + (6-0)^2}$$

$$AC = \sqrt{(7-x)^2 + (6)^2}$$

$$BC = \sqrt{(-3-x)^2 + (4-y)^2}$$

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

$$BC = \sqrt{(-3-x)^2 + (4)^2}$$

We know that both these distances are the same. So equating both these we get,

$$AC = BC$$

$$\sqrt{(7-x)^2 + (6)^2} = \sqrt{(-3-x)^2 + (4)^2}$$

Squaring on both sides we have,

$$(7-x)^2 + (6)^2 = (-3-x)^2 + (4)^2$$
$$49 + x^2 - 14x + 36 = 9 + x^2 + 6x + 16$$

$$20x = 60$$
$$x = 3$$

Hence the point on the x-axis which lies at equal distances from the mentioned points is (3,0)

Co-Ordinate Geometry Ex 14.2 Q29

Answer

The distance d between two points (x_1,y_1) and (x_2,y_2) is given by the formula

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

In a square all the sides are equal to each other. And also the diagonals are also equal to each other. Here the four points are A(5,6), B(1,5), C(2,1) and D(6,2).

First let us check if all the four sides are equal.

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

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

$$= \sqrt{16+1}$$

$$AB = \sqrt{17}$$

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

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

$$= \sqrt{1+16}$$

$$BC = \sqrt{17}$$

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

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

$$= \sqrt{16+1}$$

$$CD = \sqrt{17}$$

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

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

$$= \sqrt{1+16}$$

$$AD = \sqrt{17}$$

Here, we see that all the sides are equal, so it has to be a rhombus.

Now let us find out the lengths of the diagonals of this rhombus.

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

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

$$= \sqrt{9+25}$$

$$AC = \sqrt{34}$$

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

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

$$= \sqrt{25+9}$$

$$BD = \sqrt{34}$$

Now since the diagonals of the rhombus are also equal to each other this rhombus has to be a

Hence we have proved that the quadrilateral formed by the given four points is a square

Co-Ordinate Geometry Ex 14.2 Q30

Answer:

The distance d between two points (x_1, y_1) and (x_2, y_2) is given by the formula

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

Here we are to find out a point on the x-axis which is equidistant from both the points A(-2,5) and B(2, -3)

Let this point be denoted as C(x, y).

Since the point lies on the x-axis the value of its ordinate will be 0. Or in other words we have y = 0.

Now let us find out the distances from 'A' and 'B' to 'C'

$$AC = \sqrt{(-2-x)^2 + (5-y)^2}$$

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

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

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

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

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

We know that both these distances are the same. So equating both these we get,

AC = BC

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

Squaring on both sides we have,

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

$$4+x^{2}+4x+25=4+x^{2}-4x+9$$

$$8x = -16$$

$$x = -2$$

Hence the point on the x-axis which lies at equal distances from the mentioned points is (-2,0)