



### Co-Ordinate Geometry Ex 14.2 Q3

**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 it is said that the points  $(2, 1)$  and  $(1, -2)$  are equidistant from  $(x, y)$ .

Let  $d_1$  be the distance between  $(2, 1)$  and  $(x, y)$ .

Let  $d_2$  be the distance between  $(1, -2)$  and  $(x, y)$ .

So, using the distance formula for both these pairs of points we have

$$d_1 = \sqrt{(2-x)^2 + (1-y)^2}$$

$$d_2 = \sqrt{(1-x)^2 + (-2-y)^2}$$

Now since both these distances are given to be the same, let us equate both  $d_1$  and  $d_2$

$$d_1 = d_2$$

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

Squaring on both sides we have,

$$(2-x)^2 + (1-y)^2 = (1-x)^2 + (-2-y)^2$$

$$4 + x^2 - 4x + 1 + y^2 - 2y = 1 + x^2 - 2x + 4 + y^2 + 4y$$

$$-4x - 2y = -2x + 4y$$

$$-2x - 6y = 0$$

$$x + 3y = 0$$

Hence we have proved that when the points  $(2, 1)$  and  $(1, -2)$  are equidistant from  $(x, y)$  we have

$$\boxed{x + 3y = 0}$$

### Co-Ordinate Geometry Ex 14.2 Q4

**Answer :**

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

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

It is said that  $(x, y)$  is equidistant from both  $(-3, 0)$  and  $(3, 0)$ .

Let  $d_1$  be the distance between  $(x, y)$  and  $(-3, 0)$ .

Let  $d_2$  be the distance between  $(x, y)$  and  $(3, 0)$ .

So, using the distance formula for both these pairs of points we have

$$d_1 = \sqrt{(x+3)^2 + (y-0)^2}$$

$$d_2 = \sqrt{(x-3)^2 + (y-0)^2}$$

Now since both these distances are given to be the same, let us equate both  $d_1$  and  $d_2$ .

$$d_1 = d_2$$

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

Squaring on both sides we have,

$$(x+3)^2 + (y-0)^2 = (x-3)^2 + (y-0)^2$$

$$x^2 + 9 + 6x + y^2 = x^2 + 9 - 6x + y^2$$

$$12x = 0$$

$$x = 0$$

It is also said that the value of both  $d_1$  and  $d_2$  is 4 units.

Substituting the value of 'x' in the equation for either  $d_1$  or  $d_2$  we can get the value of 'y'.

$$d_1 = \sqrt{(x+3)^2 + (y-0)^2}$$

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

$$4 = \sqrt{9 + y^2}$$

Squaring on both sides of the equation we have,

$$16 = 9 + y^2$$

$$y^2 = 7$$

$$y = \pm\sqrt{7}$$

Hence the values of 'x' and 'y' are

$$\begin{array}{l} x = 0 \\ y = \pm\sqrt{7} \end{array}$$

\*\*\*\*\* END \*\*\*\*\*