



Co-Ordinate Geometry Ex 14.2 Q1

Answer :

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

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

(i) The two given points are $(-6, 7)$ and $(-1, -5)$

The distance between these two points is

$$\begin{aligned} d &= \sqrt{(-6+1)^2 + (7+5)^2} \\ &= \sqrt{(-5)^2 + (12)^2} \\ &= \sqrt{25+144} \\ &= \sqrt{169} \end{aligned}$$

$$d = 13$$

Hence the distance is **13 units**.

(ii) The two given points are $(a+b, b+c)$ and $(a-b, c-b)$

The distance between these two points is

$$\begin{aligned} d &= \sqrt{(a+b-a+b)^2 + (b+c-c+b)^2} \\ &= \sqrt{(2b)^2 + (2b)^2} \\ &= \sqrt{4b^2 + 4b^2} \\ &= \sqrt{8b^2} \end{aligned}$$

$$d = 2b\sqrt{2}$$

Hence the distance is **$2b\sqrt{2}$ units**.

(iii) The two given points are $(a \sin \alpha, -b \cos \alpha)$ and $(-a \cos \alpha, b \sin \alpha)$

The distance between these two points is

$$\begin{aligned} d &= \sqrt{(a \sin \alpha + a \cos \alpha)^2 + (-b \cos \alpha - b \sin \alpha)^2} \\ &= \sqrt{a^2 (\sin \alpha + \cos \alpha)^2 + b^2 (-1)^2 (\cos \alpha + \sin \alpha)^2} \\ &= \sqrt{a^2 (\sin \alpha + \cos \alpha)^2 + b^2 (\sin \alpha + \cos \alpha)^2} \\ &= \sqrt{(a^2 + b^2)(\sin \alpha + \cos \alpha)^2} \\ d &= (\sin \alpha + \cos \alpha) \sqrt{a^2 + b^2} \end{aligned}$$

Hence the distance is **$(\sin \alpha + \cos \alpha) \sqrt{a^2 + b^2}$** .

The two given points are $(a, 0)$ and $(0, b)$

The distance between these two points is

$$\begin{aligned} d &= \sqrt{(a-0)^2 + (0-b)^2} \\ &= \sqrt{a^2 + (-b)^2} \\ d &= \sqrt{a^2 + b^2} \end{aligned}$$

Hence the distance is **$\sqrt{a^2 + b^2}$** .

Co-Ordinate Geometry Ex 14.2 Q2

Answer :

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

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

The distance between two points $(3, a)$ and $(4, 1)$ is given as $\sqrt{10}$. Substituting these values in the formula for distance between two points we have,

$$\sqrt{10} = \sqrt{(3-4)^2 + (a-1)^2}$$

$$\sqrt{10} = \sqrt{(-1)^2 + (a-1)^2}$$

Now, squaring the above equation on both sides of the equals sign

$$10 = (-1)^2 + (a-1)^2$$

$$10 = 1 + (a^2 + 1 - 2a)$$

$$8 = a^2 - 2a$$

Thus we arrive at a quadratic equation. Let us solve this now,

$$a^2 - 2a - 8 = 0$$

$$a^2 - 4a + 2a - 8 = 0$$

$$a(a-4) + 2(a-4) = 0$$

$$(a-4)(a+2) = 0$$

The roots of the above quadratic equation are thus 4 and -2.

Thus the value of 'a' could either be 4 or -2.

***** END *****