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

$$d = \sqrt{(-6+1)^2 + (7+5)^2}$$
$$= \sqrt{(-5)^2 + (12)^2}$$
$$= \sqrt{25+144}$$
$$= \sqrt{169}$$
$$d = 13$$

Hence the distance is $\boxed{13 \text{ units}}$.

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

The distance between these two points is

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

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

(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

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

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

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

The distance between these two points is

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

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

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 $\boxed{4 \text{ or } -2}$.

********** END **********