



NCERT Solutions For Class 10 Chapter 7 Coordinate Geometry
Exercise 7.1

1. Find the distance between the following pairs of points:

(i) (2, 3), (4,1)

(ii) (-5, 7), (-1, 3)

(iii) (a, b), (-a, -b)

Ans. (i) Applying Distance Formula to find distance between points (2, 3) and (4,1), we get

d =

$$\sqrt{(4-2)^2 + (1-3)^2} = \sqrt{(2)^2 + (-2)^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2} \text{ units}$$

(ii) Applying Distance Formula to find distance between points (-5, 7) and (-1, 3), we get

d =

$$\sqrt{[-1-(-5)]^2 + (3-7)^2} = \sqrt{(4)^2 + (-4)^2} = \sqrt{16+16} = \sqrt{32} = 4\sqrt{2} \text{ units}$$

(iii) Applying Distance Formula to find distance between points (a, b) and (-a, -b), we get

d =

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

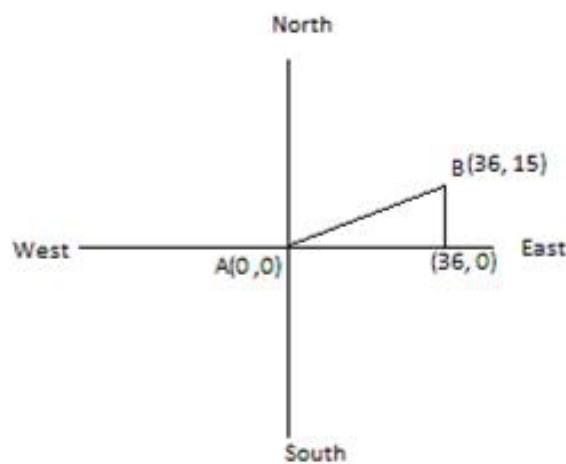
2. Find the distance between the points (0, 0) and (36, 15). Also, find the distance between towns A and B if town B is located at 36 km east and 15 km north of town A.

Ans. Applying Distance Formula to find distance between points (0, 0) and (36, 15), we get

d =

$$\sqrt{(36-0)^2 + (15-0)^2} = \sqrt{(36)^2 + (15)^2} = \sqrt{1296 + 225} = \sqrt{1521} = 39$$

Town B is located at 36 km east and 15 km north of town A. So, the location of town A and B can be shown as:



Clearly, the coordinates of point A are (0, 0) and coordinates of point B are (36, 15).

To find the distance between them, we use Distance formula:

$$d = \sqrt{[36-0]^2 + (15-0)^2} = \sqrt{(36)^2 + (15)^2} = \sqrt{1296 + 225} = \sqrt{1521} = 39 \text{ km}$$

3. Determine if the points (1, 5), (2, 3) and (-2, -11) are collinear.

Ans. Let A = (1, 5), B = (2, 3) and C = (-2, -11)

Using Distance Formula to find distance AB, BC and CA.

$$AB = \sqrt{[2-1]^2 + (3-5)^2} = \sqrt{(1)^2 + (-2)^2} = \sqrt{1+4} = \sqrt{5}$$

$$BC = \sqrt{[-2-2]^2 + (-11-3)^2} = \sqrt{(-4)^2 + (-14)^2} = \sqrt{16+196} = \sqrt{212} = 2\sqrt{53}$$

$$CA = \sqrt{[-2-1]^2 + (-11-5)^2} = \sqrt{(-3)^2 + (-16)^2} = \sqrt{9+256} = \sqrt{265}$$

Since $AB + AC \neq BC$, $BC + AC \neq AB$ and $AC \neq BC$.

Therefore, the points A, B and C are not collinear.

4. Check whether (5, -2), (6, 4) and (7, -2) are the vertices of an isosceles triangle.

Ans. Let $A = (5, -2)$, $B = (6, 4)$ and $C = (7, -2)$

Using Distance Formula to find distances AB, BC and CA.

AB =

$$\sqrt{[6-5]^2 + [4-(-2)]^2} = \sqrt{(1)^2 + (6)^2} = \sqrt{1+36} = \sqrt{37}$$

BC =

$$\sqrt{[7-6]^2 + (-2-4)^2} = \sqrt{(1)^2 + (-6)^2} = \sqrt{1+36} = \sqrt{37}$$

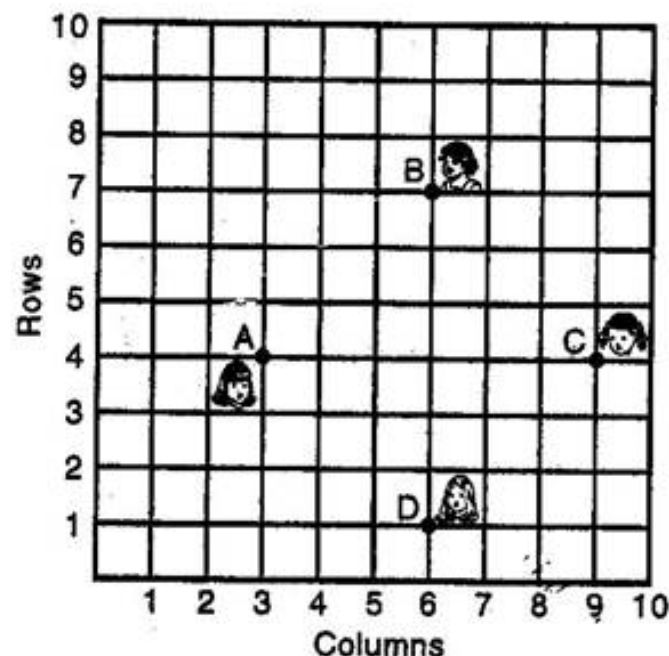
CA =

$$\sqrt{[7-5]^2 + [-2-(-2)]^2} = \sqrt{(2)^2 + (0)^2} = \sqrt{4+0} = \sqrt{4} = 2$$

Since $AB = BC$.

Therefore, A, B and C are vertices of an isosceles triangle.

5. In a classroom, 4 friends are seated at the points A (3, 4), B (6, 7), C (9, 4) and D (6, 1). Champa and Chameli walk into the class and after observing for a few minutes Champa asks Chameli, "Don't you think ABCD is a square?" Chameli disagrees. Using distance formula, find which of them is correct.



Ans. We have $A = (3, 4)$, $B = (6, 7)$, $C = (9, 4)$ and $D = (6, 1)$

Using Distance Formula to find distances AB, BC, CD and DA, we get

AB =

$$\sqrt{[6-3]^2 + [7-4]^2} = \sqrt{(3)^2 + (3)^2} = \sqrt{9+9} = \sqrt{18} = 3\sqrt{2}$$

$$BC =$$

$$\sqrt{[9-6]^2 + [4-7]^2} = \sqrt{(3)^2 + (-3)^2} = \sqrt{9+9} = \sqrt{18} = 3\sqrt{2}$$

$$CD =$$

$$\sqrt{[6-9]^2 + [1-4]^2} = \sqrt{(-3)^2 + (-3)^2} = \sqrt{9+9} = \sqrt{18} = 3\sqrt{2}$$

$$DA =$$

$$\sqrt{[6-3]^2 + [1-4]^2} = \sqrt{(3)^2 + (-3)^2} = \sqrt{9+9} = \sqrt{18} = 3\sqrt{2}$$

Therefore, All the sides of ABCD are equal here.
... (1)

Now, we will check the length of its diagonals.

$$AC = \sqrt{[9-3]^2 + [4-4]^2} = \sqrt{(6)^2 + (0)^2} = \sqrt{36+0} = 6$$

$$BD =$$

$$\sqrt{[6-6]^2 + [1-7]^2} = \sqrt{(0)^2 + (-6)^2} = \sqrt{0+36} = \sqrt{36} = 6$$

So, Diagonals of ABCD are also equal. ... (2)

From (1) and (2), we can definitely say that ABCD is a square.

Therefore, Champa is correct.

6. Name the type of quadrilateral formed, if any, by the following points, and give reasons for your answer.

(i) $(-1, -2), (1, 0), (-1, 2), (-3, 0)$

(ii) $(-3, 5), (3, 1), (0, 3), (-1, -4)$

(iii) $(4, 5), (7, 6), (4, 3), (1, 2)$

Ans. (i) Let $A = (-1, -2), B = (1, 0), C = (-1, 2)$ and $D = (-3, 0)$

Using Distance Formula to find distances AB, BC, CD and DA, we get

$$AB =$$

$$\sqrt{[1-(-1)]^2 + [0-(-2)]^2} = \sqrt{(2)^2 + (2)^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$$

$$BC =$$

$$\sqrt{[-1-1]^2 + [2-0]^2} = \sqrt{(-2)^2 + (2)^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$$

$$CD =$$

$$\sqrt{[-3-(-1)]^2 + [0-2]^2} = \sqrt{(-2)^2 + (-2)^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$$

$$DA =$$

$$\sqrt{[1-2]^2 + [0-5]^2} = \sqrt{(-1)^2 + (-5)^2} = \sqrt{1+25} = \sqrt{26} = \sqrt{26}$$

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

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