

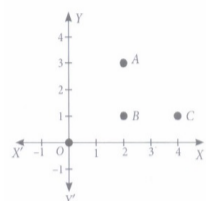
QB365 QUESTION BANK SOFTWARE

10th Maths Important Case Study Questions for Coordinate Geometry 2024

SECTION A

2 x 4 = 8

1) Alia and Shagun are friends living on the same street in Patel Nagar. Shagun's house is at the intersection of one street with another street on which there is a library. They both study in the same school and that is not far from Shagun's house. Suppose the school is situated at the point O, i.e., the origin, Alia's house is at A. Shagun's house is at B and library is at C. Based on the above information, answer the following questions.



(i) How far is Alia's house from Shagun's house?

- (a) 3 units (b) 4 units (c) 5 units (d) 2 units**

(ii) How far is the library from Shagun's house?

- (a) 3 units (b) 2 units (c) 5 units (d) 4 units**

(iii) How far is the library from Alia's house?

- (a) 2 units (b) 3 units (c) 4 units (d) None of these**

(iv) Which of the following is true?

- (a) ABC forms a scalene triangle (b) ABC forms an isosceles triangle**
(c) ABC forms an equilateral triangle (d) None of these

(v) How far is the school from Alia's house than Shagun's house?

- (a) $\sqrt{13}$ units (b) $\sqrt{5}$ units (c) $(\sqrt{13} + \sqrt{5})$ units (d) $(\sqrt{13} - \sqrt{5})$ units**

Answer : (i) (d): Since the coordinates of A and B are (2, 3) and (2, 1) respectively.

\therefore Required distance = AB

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

(ii) (b): Since, library is situated at C(4, 1)

\therefore Required distance = BC

$$= \sqrt{(4 - 2)^2 + (1 - 1)^2} = \sqrt{2^2 + 0^2} = 2 \text{ units}$$

(iii) (d): Required distance = AC

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

(iv) (b): Since $AB = BC \neq AC$, therefore $\triangle ABC$ is an isosceles triangle.

(v) (d): Distance between O and A

$$= \sqrt{2^2 + 3^2} = \sqrt{4 + 9} = \sqrt{13} \text{ units}$$

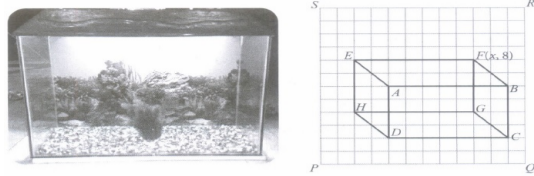
and distance between O and B =

$$\sqrt{2^2 + 1^2} = \sqrt{4 + 1} = \sqrt{5} \text{ units}$$

Thus, required distance = $(\sqrt{13} - \sqrt{5})$ units

2) According to medical science and research, keeping an aquarium in the house helps in treating stress, anxiety and health problems associated with blood pressure. It also provides visual stimulation that boost your focus and creativity. A sketch of an aquarium is drawn, which is

given in the following figure.



Considering P as origin, answer the following questions.

(i) The coordinates of H are

- (a) (4,2) (b) (4,3) (c) (2,4) (d) (4,8)

(ii) Distance of the point G from the y-axis is

- (a) 3 (b) 4 (c) 5 (d) 9
units units units units

(iii) Length of side HG =

- (a) 6 (b) 7 (c) 8 (d) 9
units units units units

(iv) The length of diagonal FD and the value of x, respectively are

- (a) 8 (b) $\sqrt{8}$ (c) $\sqrt{15}$ (d) $\sqrt{61}$
units,4 units,5 units,9 units,9

(v) If Q is considered as origin, then the coordinates of mid-point of BC are

- (a) (-1,4) (b) (1,6) (c) (6,1) (d) (6,-1)

Answer : (i) (c): We are given that P is origin.

\therefore Coordinates of H are (2,4).

(ii) (d): Coordinates of G are (9,4), therefore distance of G from y-axis = 9 units.

(iii) (b) : Coordinates of H are (2, 4) and coordinates of G are (9, 4).

Thus, $GH = \sqrt{(9 - 2)^2 + (4 - 4)^2} = \sqrt{7^2 + 0} = 7$ units

(iv) (d): Coordinates of D are (4,2) and coordinates of F are (9, 8).

$\Rightarrow x = 9$

Also, length of diagonal FD = $\sqrt{(4 - 9)^2 + (2 - 8)^2}$

= $\sqrt{25 + 36} = \sqrt{61}$ units

(v) (a): If Q is origin, then Coordinates of B are (-1,6) and of C are (-1,2).

Now, mid-point BC = $\left(\frac{(-1)+(-1)}{2}, \frac{6+2}{2} \right)$ i.e., (-1, 4)