

FlexiPrep

CBSE Class 10-Mathematics: Chapter – 7 Coordinate Geometry Part 23 (For CBSE, ICSE, IAS, NET, NRA 2022)

Get top class preparation for CBSE/Class-10 right from your home: [get questions, notes, tests, video lectures and more](#)- for all subjects of CBSE/Class-10.

Question 17:

Find the coordinates of the points which divides the line segment joining $A(-2,2)$ and $B(2,8)$ into four equal parts.

Answer:

$$A = (-2,2) \text{ and } B = (2,8)$$

Let P, Q and R are the points which divide line segment AB into 4 equal parts.

Let coordinates of point $P = (x_1, y_1)$, $Q = (x_2, y_2)$ and $R = (x_3, y_3)$

We know $AP = PQ = QR = \vec{r}$.

It means, point P divides line segment AB in $1 : 3$.

Using Section formula to find coordinates of point P , we get

$$x_1 = \frac{(-2) \times 3 + 2 \times 1}{1 + 3} = \frac{-6 + 2}{4} = \frac{-4}{4} = -1$$

$$y_1 = \frac{2 \times 3 + 8 \times 1}{1 + 3} = \frac{6 + 8}{4} = \frac{14}{4} = \frac{7}{2}$$

Since $AP = PQ = QR = \vec{r}$.

It means, point Q is the mid-point of AB .

Using Section formula to find coordinates of point Q , we get

$$x_2 = \frac{(-2) \times 1 + 2 \times 1}{1 + 1} = \frac{-2 + 2}{2} = \frac{0}{2} = 0$$

$$y_2 = \frac{2 \times 1 + 8 \times 1}{1 + 3} = \frac{2 + 8}{2} = \frac{10}{2} = 5$$

Because $AP = PQ = QR = \vec{r}$.

It means, point R divides line segment AB in $3 : 1$

Using Section formula to find coordinates of point P , we get

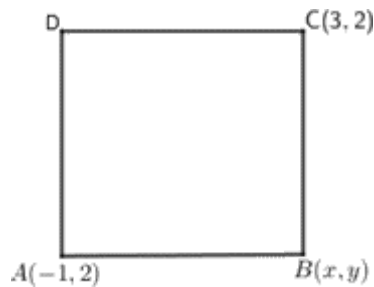
$$x_3 = \frac{(-2) \times 1 + 2 \times 3}{1 + 1} = \frac{-2 + 6}{4} = \frac{4}{4} = 1$$

$$y_3 = \frac{2 \times 1 + 8 \times 1}{1 + 3} = \frac{2 + 24}{4} = \frac{26}{4} = \frac{13}{2}$$

Therefore, $P = \left(-1, \frac{7}{2}\right)$, $Q = (0,5)$ and $R = \left(1, \frac{13}{2}\right)$

Question 18:

The two opposite vertices of a square are $(-1,2)$ and $(3,2)$ Find the coordinates of the other two vertices.



©FlexiPrep. Report @violations @<https://tips.fbi.gov/>

Answer:

Let ABCD be a square and $B(x, y)$ be the unknown vertex.

$$AB = BC$$

$$\Rightarrow AB^2 = BC^2$$

$$\Rightarrow (x + 1)^2 + (y - 2)^2 = (x - 3)^2 + (y - 2)^2$$

$$\Rightarrow 2x + 1 = -6x + 9$$

$$\Rightarrow 8x = 8$$

$$\Rightarrow x = 1 \dots (i)$$

$$\text{In } \triangle ABC, AB^2 + BC^2 = AC^2$$

$$\Rightarrow (x + 1)^2 + (y - 2)^2 + (x - 3)^2 + (y - 2)^2 = (3 + 1)^2 + (2 - 2)^2$$

$$\Rightarrow 2x^2 + 2y^2 + 2x - 4y - 6x - 4y + 1 + 4 + 9 + 4 = 16$$

$$\Rightarrow 2x^2 + 2y^2 - 4x - 8y + 2 = 0$$

$$\Rightarrow x^2 + y^2 - 2x - 4y + 1 = 0 \dots (\text{ii})$$

Putting the value of x in eq. (ii) ,

$$1 + y^2 - 2 - 4y + 1 = 0$$

$$\Rightarrow y^2 - 4y = 0$$

$$\Rightarrow y(y - 4) = 0$$

$$\Rightarrow y = 0 \text{ or } 4$$

Developed by: [Mindsprite Solutions](#)