Co-Ordinate Geometry Ex 14.4 Q8

Answer :

We have a right angled triangle ΔBOA , right angled at O. Co-ordinates are B (0,2*b*); A (2*a*, 0) and C (0, 0).

We have to prove that mid-point C of hypotenuse AB is equidistant from the vertices.

In general to find the mid-point $P(x,y)$ of two points $A(x_1,y_1)$ and $B(x_2,y_2)$ we use section formula as,

$$P(x,y)=\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$$

So co-ordinates of C is,

$$C(a,b)$$

In general, the distance between $A(x_1,y_1)$ and $B(x_2,y_2)$ is given by,

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

So,

$$CO=\sqrt{(a-0)^2+(b-0)^2}$$
$$=\sqrt{a^2+b^2}$$
$$CB=\sqrt{(a-0)^2+(b-2b)^2}$$
$$=\sqrt{a^2+b^2}$$
$$CA=\sqrt{(a-2a)^2+(b-0)^2}$$
$$=\sqrt{a^2+b^2}$$

Hence, mid–point C of hypotenuse AB is equidistant from the vertices.

Co-Ordinate Geometry Ex 14.4 Q9

Answer :

We have to find the co-ordinates of the third vertex of the given triangle. Let the co-ordinates of the third vertex be (x,y).

The co-ordinates of other two vertices are (−3, 1) and (0, −2)

The co-ordinate of the centroid is (0, 0)

We know that the co-ordinates of the centroid of a triangle whose vertices are $(x_1,y_1),(x_2,y_2),(x_3,y_3)$ is-

$$\left(\frac{x_1+x_2+x_3}{3},\frac{y_1+y_2+y_3}{3}\right)$$

So,

$$(0,0)=\left(\frac{x+0-3}{3},\frac{y+1-2}{3}\right)$$

Compare individual terms on both the sides-

$$\frac{x-3}{3}=0$$

So,

$$x=3$$

Similarly,

$$\frac{y-1}{3}=0$$

So,

$$y=1$$

So the co-ordinate of third vertex $\boxed{(3,1)}$

Co-Ordinate Geometry Ex 14.4 Q10

Answer :

We have to find the co-ordinates of the third vertex of the given triangle. Let the co-ordinates of the third vertex be (x, y).

The co-ordinates of other two vertices are A (3, 2) and C (−2, 1)

The co-ordinate of the centroid is $\left(\frac{5}{3}, -\frac{1}{3}\right)$

We know that the co-ordinates of the centroid of a triangle whose vertices are $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ is-

$$\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$$

So,

$$\left(\frac{5}{3}, -\frac{1}{3}\right) = \left(\frac{x+3-2}{3}, \frac{y+2+1}{3}\right)$$

Compare individual terms on both the sides-

$$\frac{x+1}{3} = \frac{5}{3}$$

So,

$$x = 4$$

Similarly,

$$\frac{y+3}{3} = -\frac{1}{3}$$

So,

$$y = -4$$

So the co-ordinate of third vertex $\boxed{(4, -4)}$

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