

# Co-Ordinate Geometry Ex 14.4 Q8

### Answer:

We have a right angled triangle  $\Delta BOA$ , right angled at O. Co-ordinates are B (0,2b); A (2a, 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 =  $\sqrt{(a-0)^2 + (b-2b)^2}$ 

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

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 (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-

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

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

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 (4,-4)

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