

# 3-3.2-6

EE24BTECH11010 - Balaji

## Question :

Draw a right triangle  $ABC$  in which  $BC = 12\text{cm}$ ,  $AB = 5\text{cm}$  and  $\angle B = 90^\circ$ .

## Solution:

Variable	Description	Value
$a$	Length of $BC$	$12\text{cm}$
$b$	Length of $AC$	$?$
$c$	Length of $AB$	$5\text{cm}$
$\angle ABC$	Angle $B$	$90^\circ$

TABLE 0

Using cosine rule, we can find the length of  $AC$ , i.e.,  $b$ :

$$b^2 = a^2 + c^2 - 2ac \cos B \quad (1)$$

$$b^2 = 12^2 + 5^2 - 120 \cos 90^\circ \quad (2)$$

On solving, we get  $b$  as:

$$b = 13\text{cm} \quad (3)$$

The coordinates of  $\triangle ABC$  can then be expressed as

$$\mathbf{A} = c \begin{pmatrix} \cos B \\ \sin B \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} a \\ 0 \end{pmatrix} \quad (4)$$

From above substituting the values of  $a, b, c$ , we get

$$\mathbf{A} = 5 \begin{pmatrix} \cos 90^\circ \\ \sin 90^\circ \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 12 \\ 0 \end{pmatrix} \quad (5)$$

$$\therefore \mathbf{A} = \begin{pmatrix} 0 \\ 5 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 12 \\ 0 \end{pmatrix} \quad (6)$$

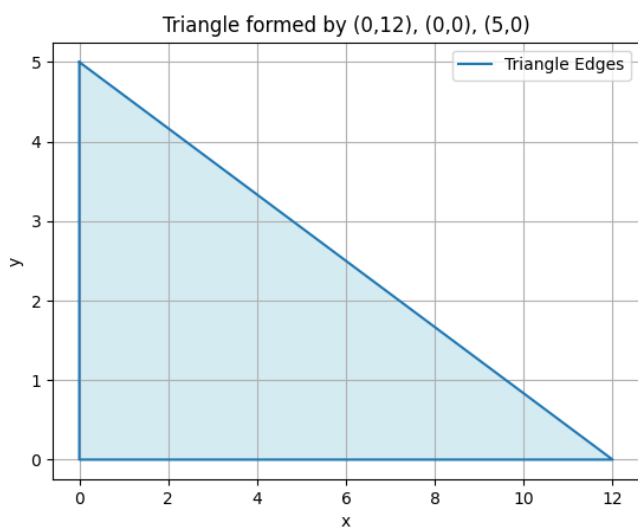


Fig. 0.1