

# ASSIGNMENT-1

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## 1 QUESTION NO-2.27

Construct  $\triangle ABC$  such that  $AC = 3, \angle A = 70^\circ$  and  $\angle B = 50^\circ$ .

The vertices of  $\triangle ABC$  are

$$\mathbf{A} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 1.159 \\ 3.187 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 3 \\ 0 \end{pmatrix} \quad (2.0.16)$$

## 2 SOLUTION

To find angle C:

$$\angle A + \angle B + \angle C = 180^\circ \quad (2.0.1)$$

$$\angle C = 180^\circ - 120^\circ \quad (2.0.2)$$

$$= 60^\circ \quad (2.0.3)$$

Now we shall find the sides by using the formula

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

To find side  $a$

$$a = b \frac{\sin A}{\sin B} \quad (2.0.4)$$

$$= 3 \frac{\sin 70^\circ}{\sin 50^\circ} \quad (2.0.5)$$

$$= 3.68 \quad (2.0.6)$$

To find side  $c$

$$c = b \frac{\sin C}{\sin B} \quad (2.0.7)$$

$$= 3 \frac{\sin 60^\circ}{\sin 50^\circ} \quad (2.0.8)$$

$$= 3.3915 \quad (2.0.9)$$

Now to find the coordinates of B(p,q)

To find  $p$

$$p = c \cos 70^\circ \quad (2.0.10)$$

$$= 3.3915 \cos 70^\circ \quad (2.0.11)$$

$$= 1.159 \quad (2.0.12)$$

To find  $q$

$$q = c \sin 70^\circ \quad (2.0.13)$$

$$= 3.3915 \sin 70^\circ \quad (2.0.14)$$

$$= 3.187 \quad (2.0.15)$$

Lines AB, BC, CA are then generated and plotted using these coordinates to construct  $\triangle ABC$

Plot of the  $\triangle ABC$

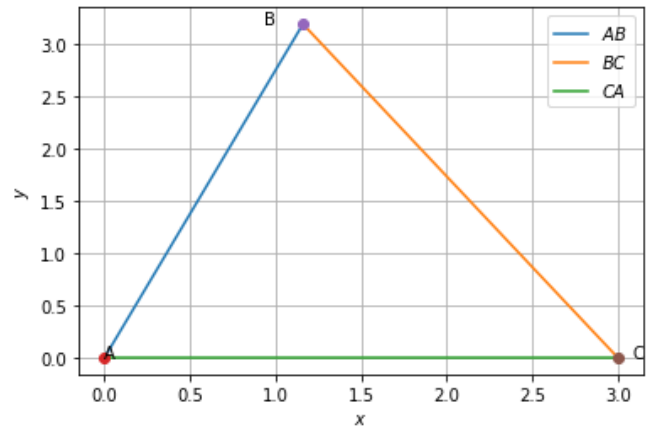


Fig. 2.1: Plot of  $\triangle ABC$