# Assignment 1

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Download all python codes from

https://github.com/teja3657/Assignment1/tree/master/CODES

and latex-tikz codes from

https://github.com/teja3657/Assignment1/blob/master/Assignment1.tex

## 1 Question No.2.16

Construct an isosceles triangle in which the lengths of the equal sides is 6.5 and the angle between them is 110°.

## 2 SOLUTION

Let the vertices are:

$$\mathbf{A} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} b \\ 0 \end{pmatrix}, \mathbf{B} = c \begin{pmatrix} \cos A \\ \sin A \end{pmatrix} \tag{2.0.1}$$

The vertex B can be expressed in polar coordinate form as

$$\mathbf{B} = c \begin{pmatrix} \cos A \\ \sin A \end{pmatrix} \tag{2.0.2}$$

$$\mathbf{B} = 6.5 \begin{pmatrix} \cos 110 \\ \sin 110 \end{pmatrix} \tag{2.0.3}$$

$$B = 6.5 \begin{pmatrix} -0.34202 \\ 0.93969 \end{pmatrix} \tag{2.0.4}$$

$$B = \begin{pmatrix} -2.22313 \\ 6.10798 \end{pmatrix} \tag{2.0.5}$$

So, the vertices of isosceles $\triangle ABC$ are

$$\mathbf{A} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 6.5 \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} -2.22313 \\ 6.10798 \end{pmatrix} \tag{2.0.6}$$

Now, Lines $AB$ , $BC$ and $CA$ Can be plotted using these coordinates to form an isosceles $\triangle ABC$.

Plot of the Isosceles $\triangle ABC$:

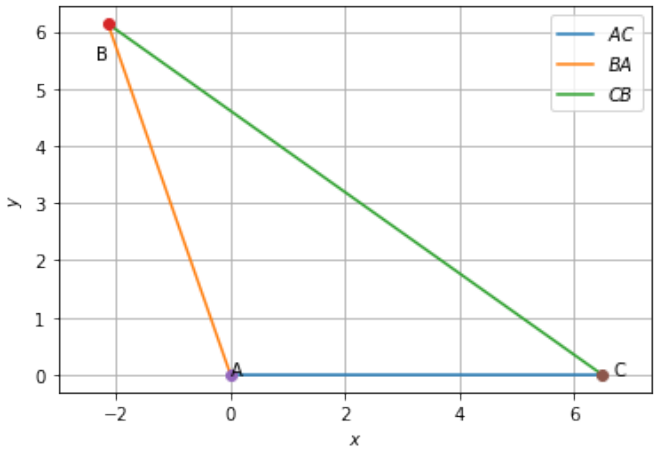


Fig. 2.1: Isosceles $\triangle ABC$