3-3-9

AI24BTECH11008- Sarvajith

Question:
Draw an isosceles triangle ABC in which BC = 5.5cm and altitude AL = 5.3cm.
Solution:
The vertices of the above triangle are given by:

lengths	values
BC	5.5cm
AL	5.3cm

TABLE 1 0: values of lengths of triangle

$$\mathbf{A} = c\begin{pmatrix}\cos B\\ \sin B\end{pmatrix} \tag{0.1}$$

$$\mathbf{B} = \begin{pmatrix}0\\0\end{pmatrix} \tag{0.2}$$

$$\mathbf{C} = \begin{pmatrix}a\\0\end{pmatrix} \tag{0.3}$$

Where a,b,c are BC,AB,AC respectively and B is the angle formed by the side AB and BC.
AL bisects BC, then 2 right angled triangle ALB and ALC are formed.
from the pythogoras theorem

$$\begin{aligned} AB^2 &= AL^2 + BL^2 \\ c^2 &= 5.3^2 + 2.75^2 \\ c &= \sqrt{35.65} \\ c &= 5.97 \\ \cos B = \frac{BL}{c} &= 0.46 \\ \sin B = \frac{AL}{c} &= 0.88 \end{aligned}$$

substituting the above values 0.1,0.3

$$\mathbf{A} = \begin{pmatrix} 2.75 \\ 5.3 \end{pmatrix}$$

$$\mathbf{B} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$\mathbf{C} = \begin{pmatrix} 5.5 \\ 0 \end{pmatrix}$$

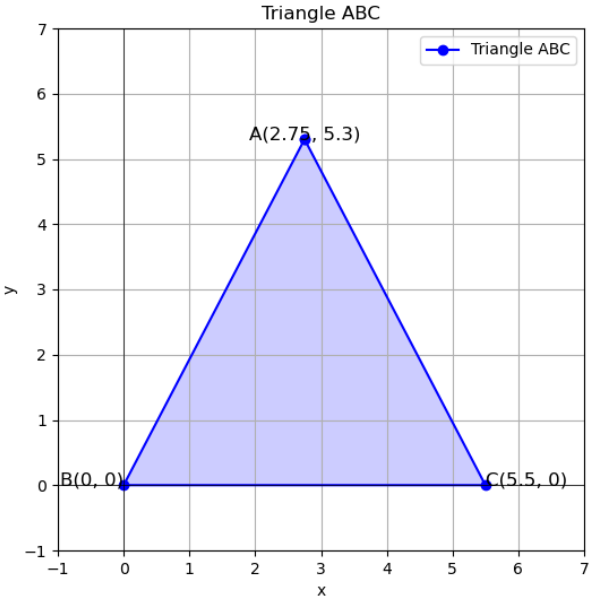

Fig. 0.1: plot for isosceles triangle