

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>

B can be expressed as

$$B = 10.6 \begin{pmatrix} -0.34202 \\ 0.93969 \end{pmatrix} \quad (2.0.12)$$

$$= \begin{pmatrix} -2.22313 \\ 6.10798 \end{pmatrix} \quad (2.0.13)$$

So, the vertices of $\triangle ABC$ are

$$A = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, C = \begin{pmatrix} 6.5 \\ 0 \end{pmatrix}, B = \begin{pmatrix} -2.22313 \\ 6.10798 \end{pmatrix} \quad (2.0.14)$$

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

The vertices are:

$$A = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, C = \begin{pmatrix} a \\ 0 \end{pmatrix}, B = \begin{pmatrix} p \\ q \end{pmatrix} \quad (2.0.1)$$

In $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ \quad (\because \angle B = \angle C) \quad (2.0.2)$$

$$\angle B = \angle C = 35^\circ \quad (2.0.3)$$

$$BC = 2(6.5) \cos(35) \quad (2.0.4)$$

$$c = 10.64 \quad (2.0.5)$$

The vertex B can be expressed in polar coordinate form as

$$B = c \begin{pmatrix} \cos A \\ \sin A \end{pmatrix} \quad (2.0.6)$$

From $\triangle ABC$, we use the law of cosines:

$$b^2 = c^2 + a^2 - 2ca \cos B \quad (2.0.7)$$

$$\cos B = \frac{c^2 + a^2 - b^2}{2ca} \quad (2.0.8)$$

$$\cos B = \frac{112.36}{137.8} \quad (2.0.9)$$

$$\cos B = 0.815 \quad (2.0.10)$$

$$B = 35.412 \quad (2.0.11)$$

Plot of the Isosceles $\triangle ABC$:

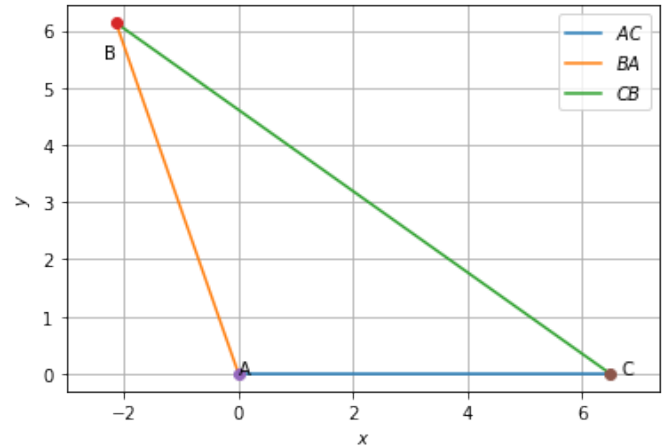


Fig. 2.1: Isosceles triangle $\triangle ABC$