

3 - Constructions

EE1030:Matrix Theory

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Question:3.2.29

Draw a triangle ABC in which $AB = 5$ cm, $BC = 6$ cm and $\angle ABC = 60^\circ$.

Solution:

Actual Name	Assigned Variable	Given values
AB	c	5 cm
BC	a	6 cm
$\angle ABC$	$\angle B$	60°

Table 3.2.29.1 0: Variables and its values

In $\triangle ABC$, if \mathbf{B} is considered as origin then the coordinates are represented by

$$\mathbf{A} = c \begin{pmatrix} \cos(\angle B) \\ \sin(\angle B) \end{pmatrix} \quad (0.1)$$

$$\mathbf{B} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (0.2)$$

$$\mathbf{C} = \begin{pmatrix} a \\ 0 \end{pmatrix} \quad (0.3)$$

Since $\angle B = 60^\circ$,

$$\cos(\angle B) = \frac{1}{2} \quad (0.4)$$

$$\sin(\angle B) = \frac{\sqrt{3}}{2} \quad (0.5)$$

Therefore using equations 0.1 and 0.3,

$$\mathbf{A} = 5 \begin{pmatrix} \frac{1}{2} \\ \frac{\sqrt{3}}{2} \end{pmatrix} \quad (0.6)$$

$$\mathbf{A} = \frac{5}{2} \begin{pmatrix} 1 \\ \sqrt{3} \end{pmatrix} \quad (0.7)$$

$$\mathbf{B} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (0.8)$$

$$\mathbf{C} = \begin{pmatrix} 6 \\ 0 \end{pmatrix} \quad (0.9)$$

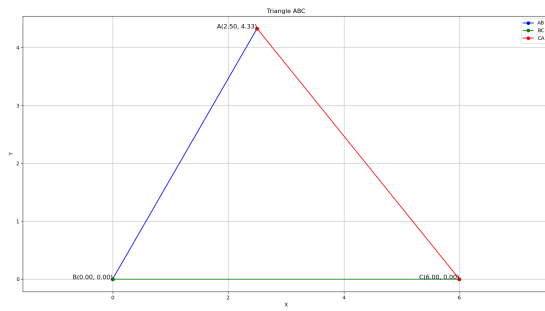


Fig. 0.1: Triangle ABC