ASSIGNMENT-1

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and latex-tikz codes from

1 QUESTION NO-2.27

2 CONSTRUCT $\triangle ABC$ SUCH THAT $AC =$ 3, $\angle A = 70°$ and $\angle B = 50°$.

3 SOLUTION

To find angle C:

$$\angle A + \angle B + \angle C = 180° \tag{3.0.1}$$
$$\angle C = 180° - 120° \tag{3.0.2}$$
$$= 60° \tag{3.0.3}$$

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

$$a = b \; \frac{\sin A}{\sin B} \tag{3.0.4}$$
$$= 3 \; \frac{\sin 70°}{\sin 50°} \tag{3.0.5}$$
$$= 3.68 \tag{3.0.6}$$

To find side c

$$c = b \; \frac{\sin C}{\sin B} \tag{3.0.7}$$
$$= 3 \; \frac{\sin 60°}{\sin 50°} \tag{3.0.8}$$
$$= 3.3915 \tag{3.0.9}$$

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

$$p = c \; \cos 70° \tag{3.0.10}$$
$$= 3.3915 \; \cos 70° \tag{3.0.11}$$
$$= 1.159 \tag{3.0.12}$$

To find q

$$q = c \; \sin 70° \tag{3.0.13}$$
$$= 3.3915 \; \sin 70° \tag{3.0.14}$$
$$= 3.187 \tag{3.0.15}$$

The vertices of $\triangle ABC$ are

$$\mathbf{A} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 1.159 \\ 3.187 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 3 \\ 0 \end{pmatrix} \tag{3.0.16}$$

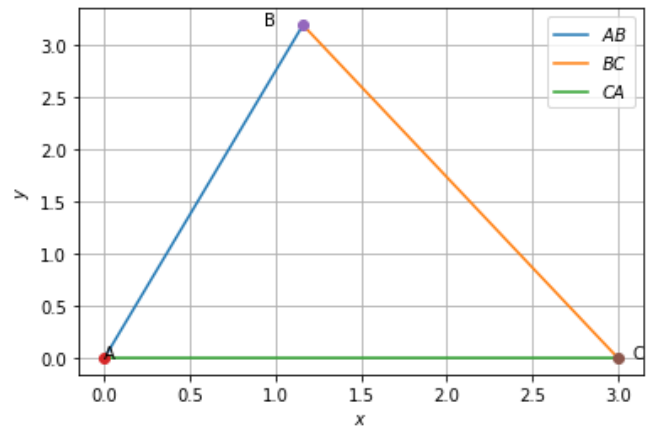Lines AB,BC,CA are then generated and plotted using these coordinates to construct $\triangle ABC$
Plot of the $\triangle ABC$

Fig. 3.1: Plot of $\triangle ABC$