ASSIGNMENT-1

R.YAMINI

1 QUESTION NO-2.27

Construct $\triangle ABC$ such that $AC = 3, \angle A = 70°$ and $\angle B = 50°$.

2 SOLUTION

To find angle C:

$$\angle A + \angle B + \angle C = 180° \qquad (2.0.1)$$
$$\angle C = 180° - 120° \qquad (2.0.2)$$
$$= 60° \qquad (2.0.3)$$

Now we shall find the sides by using the formula

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \qquad (2.0.4)$$

To find side a

$$a = b \; \frac{\sin A}{\sin B} \qquad (2.0.5)$$
$$= 3 \; \frac{\sin 70°}{\sin 50°} \qquad (2.0.6)$$
$$= 3.68 \qquad (2.0.7)$$

To find side c

$$c = b \; \frac{\sin C}{\sin B} \qquad (2.0.8)$$
$$= 3 \; \frac{\sin 60°}{\sin 50°} \qquad (2.0.9)$$
$$= 3.3915 \qquad (2.0.10)$$

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

$$p = c \; \cos 70° \qquad (2.0.11)$$
$$= 3.3915 \; \cos 70° \qquad (2.0.12)$$
$$= 1.159 \qquad (2.0.13)$$

To find q

$$q = c \; \sin 70° \qquad (2.0.14)$$
$$= 3.3915 \; \sin 70° \qquad (2.0.15)$$
$$= 3.187 \qquad (2.0.16)$$

The vertices of $\triangle ABC$ are

$$\mathbf{A} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 1.159 \\ 3.187 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 3 \\ 0 \end{pmatrix} \qquad (2.0.17)$$

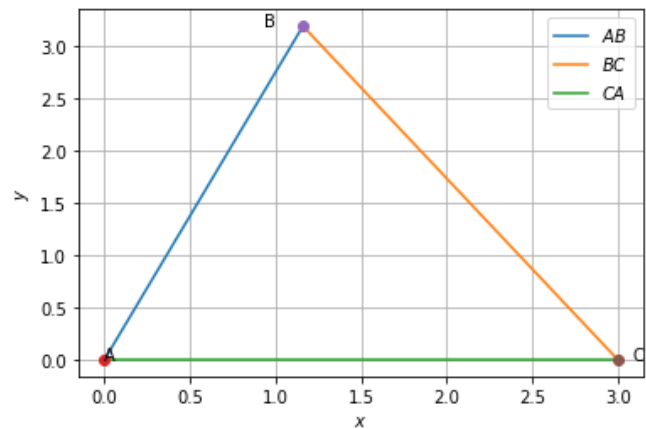Lines AB,BC,CA are then generated and plotted using these coordinates to construct $\triangle ABC$
Plot of the $\triangle ABC$

Fig. 2.1: Plot of $\triangle ABC$