Assignment 1

Kavya Kamal

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1 QUESTION No. 2.14

Construct $\triangle PQR$ given that $PQ = 3$, $QR = 5.5$ and $\angle PQR = 60°$

2 SOLUTION

$$Given, PQ = 3, QR = 5.5, \angle PQR = 60° \quad (2.0.1)$$

$$Let, PQ = r, QR = p \quad (2.0.2)$$

The vertex P can be expressed in polar coordinate form as:

$$\mathbf{P} = r\begin{pmatrix} \cos\theta \\ \sin\theta \end{pmatrix}, \mathbf{Q} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{R} = \begin{pmatrix} p \\ 0 \end{pmatrix} \quad (2.0.3)$$

This can be written as,

$$\mathbf{P} = 3\begin{pmatrix} \cos 60 \\ \sin 60 \end{pmatrix} = \begin{pmatrix} 1.5 \\ (3\sqrt{3})/2 \end{pmatrix}, \mathbf{Q} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{R} = \begin{pmatrix} 5.5 \\ 0 \end{pmatrix} \quad (2.0.4)$$
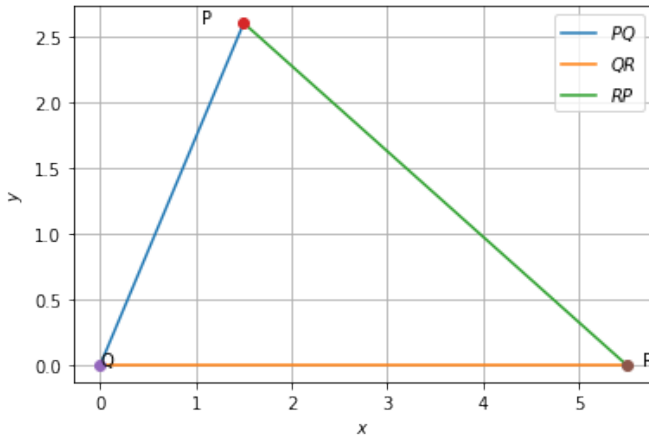
The values of P, Q and R are substituted and the triangle is plotted as given above.

Fig. 0: The Constructed triangle