

Assignment 1

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Download all python codes from

<https://github.com/Ravalika1630/Assignment1/blob/main/assignment1.py>

and latex-tikz codes from

<https://github.com/Ravalika1630/Assignment1/blob/main/main.text>

Lines PQ , QR and RP are then generated and plotted using these coordinates to form $\triangle PQR$. Here In $\triangle PQR$ Two sides are equal. So $\triangle PQR$ is a isosceles triangle. Plot of the isosceles $\triangle PQR$:

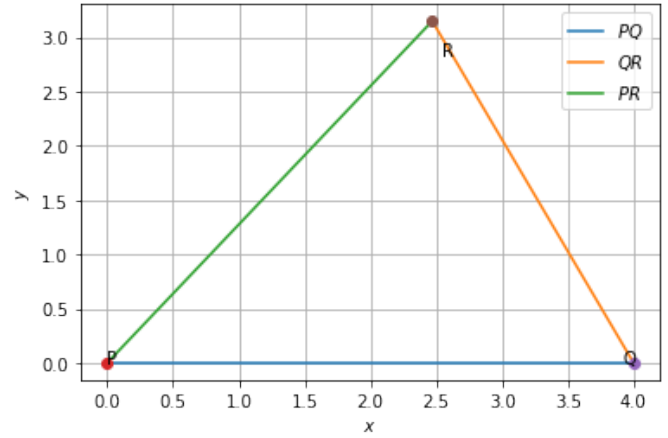


Fig. 2.1: isosceles $\triangle PQR$

1 QUESTION No. 2.12

Draw $\triangle PQR$ with $PQ=4$, $QR=3.5$ and $PR=4$. what type of triangle is this?

2 SOLUTION

Let

$$\mathbf{P} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{Q} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}, \mathbf{R} = \begin{pmatrix} a \\ b \end{pmatrix} \quad (2.0.1)$$

The vertex \mathbf{R} can be expressed in *polar coordinate form* as

$$\mathbf{R} = PR \begin{pmatrix} \cos \theta \\ \sin \theta \end{pmatrix} \quad (2.0.2)$$

where,

$$PQ \frac{\sin \theta}{2} = \frac{QR}{2} \quad (2.0.3)$$

$$\theta = 2 \sin^{-1} \left(\frac{QR}{2PQ} \right) \quad (2.0.4)$$

$$\theta = 2 \sin^{-1} \left(\frac{3.5}{8} \right) \quad (2.0.5)$$

$$\theta = 51.88 \quad (2.0.6)$$

$$\mathbf{R} = 4 \begin{pmatrix} 0.6173 \\ 0.786 \end{pmatrix} \quad (2.0.7)$$

$$\mathbf{R} = \begin{pmatrix} 2.47 \\ 3.15 \end{pmatrix} \quad (2.0.8)$$

so, the vertices of $\triangle PQR$ are

$$\mathbf{P} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{Q} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}, \mathbf{R} = \begin{pmatrix} 2.47 \\ 3.15 \end{pmatrix} \quad (2.0.9)$$