

# Assignment 1

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Download all python codes from

[https://github.com/Ravalika1630/Assignment1/blob/main/assignment1%20\(1\).py](https://github.com/Ravalika1630/Assignment1/blob/main/assignment1%20(1).py)

and latex-tikz codes from

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

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  $\triangle PQR$  :

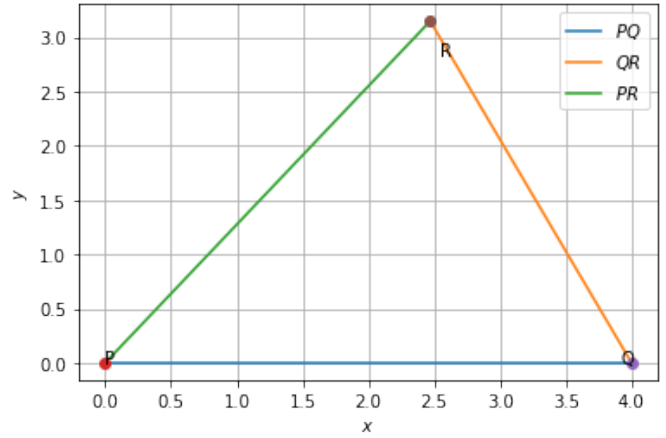


Fig. 2.1: isosceles  $\triangle PQR$

## 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,

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

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

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

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

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

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

so, the vertices of  $\triangle PQR$  are

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