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

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

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

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

$$\mathbf{R} = PR \begin{pmatrix} \cos\theta \\ \sin\theta \end{pmatrix} \tag{2.0.2}$$

where,

$$PQ \frac{\sin\theta}{2} = \frac{QR}{2} \tag{2.0.3}$$

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

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

$$\theta = 51.88 \tag{2.0.6}$$

$$\mathbf{R} = 4\begin{pmatrix} 0.6173 \\ 0.786 \end{pmatrix} \tag{2.0.7}$$

$$\mathbf{R} = \begin{pmatrix} 2.47 \\ 3.15 \end{pmatrix} \tag{2.0.8}$$

so,the vertices of $\triangle PQR$ are

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

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 $\triangle PQR$:

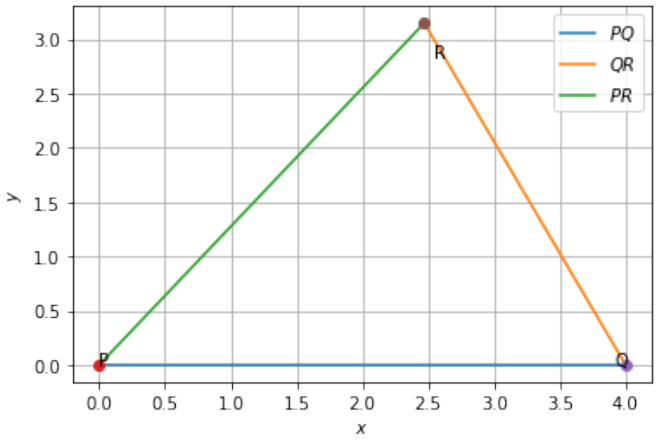

Fig. 2.1: isosceles $\triangle PQR$