Assignment 1

A.Tejasri

Download all python codes from

https://github.com/teja3657/Assignment1/tree/master/CODES

and latex-tikz codes from

https://github.com/teja3657/Assignment1/blob/master/Assignment1.tex

1 Question No.2.16

Construct an isosceles triangle in which the lengths of the equal sides is 6.5 and the angle between them is 110°.

2 SOLUTION

The vertices are:

$$\mathbf{L} = \begin{pmatrix}0\\0\end{pmatrix}, \mathbf{D} = \begin{pmatrix}ld\\0\end{pmatrix}, \mathbf{O} = \begin{pmatrix}p1\\q1\end{pmatrix} \tag{2.0.1}$$

In $\triangle OLD$,

$$\angle O + \angle L + \angle D = 180^{\circ} \quad (\because \angle O = \angle D) \tag{2.0.2}$$

$$\angle O = \angle D = 35^{\circ} \tag{2.0.3}$$

$$\mathbf{OD} = 2a\cos(35) \quad (\because a = ol = 6.5) \tag{2.0.4}$$

$$= 10.6 \tag{2.0.5}$$

The vertex O can be expressed in polar coordinate form as

$$\mathbf{O} = ol\begin{pmatrix}\cos\theta\\\sin\theta\end{pmatrix} \tag{2.0.6}$$

O can be expressed as

$$= 6.5\begin{pmatrix}cos35\\sin35\end{pmatrix} \quad (\because ol = 6.5) \tag{2.0.7}$$

$$= 6.5\begin{pmatrix}0.819\\0.573\end{pmatrix} \tag{2.0.8}$$

$$= \begin{pmatrix}5.324\\3.728\end{pmatrix} \tag{2.0.9}$$

So, the vertices of $\triangle OLD$ are

$$\mathbf{L} = \begin{pmatrix}0\\0\end{pmatrix}, \mathbf{D} = \begin{pmatrix}6.5\\0\end{pmatrix}, \mathbf{O} = \begin{pmatrix}5.324\\3.728\end{pmatrix} \tag{2.0.10}$$

Plot of the Isosceles $\triangle OLD$:

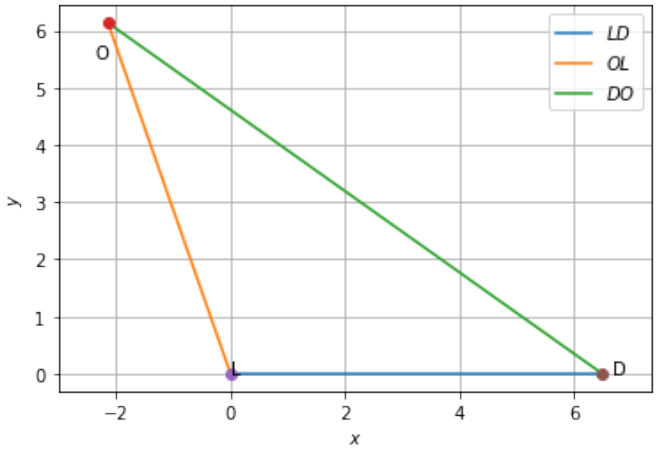

Fig. 2.1: Isosceles triangle $\triangle OLD$