ASSIGNMENT 1

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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:

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

Now, Lines od , ol and ld Can be plotted.

$$\mathbf{OD} = 2 * a * cos(35) \tag{2.0.2}$$

$$(here, a = ol) \tag{2.0.3}$$

$$\mathbf{OD} = 2 * 6.5 * cos(35) = 10.6 \tag{2.0.4}$$

$$Coordinates of O(p1, q1) \tag{2.0.5}$$

$$\mathbf{p1} = (ld^2 + ol^2 - od^2)/(2 * ld) \tag{2.0.6}$$

$$\mathbf{p1} = ((6.5)^2 + (6.5)^2 - (10.6)^2)/(2 * 6.5) \tag{2.0.7}$$

$$= (42.25 + 42.25 - 112.36)/13 = -2.14 \tag{2.0.8}$$

$$\mathbf{q1} = np.sqrtol^2 - p1^2 \tag{2.0.9}$$

$$\mathbf{q1} = np.sqrt(6.5)^2 - (-2.14)^2 \tag{2.0.10}$$

$$= 6.13 \tag{2.0.11}$$

$$\mathbf{L} = \begin{pmatrix}0\\0\end{pmatrix}, \mathbf{D} = \begin{pmatrix}6.5\\0\end{pmatrix}, \mathbf{O} = \begin{pmatrix}-2.14\\6.13\end{pmatrix} \tag{2.0.12}$$

Now, Isosceles $\triangle OLD$ can be plotted using vertices LD ,OL and DO.
Plot of the Isosceles $\triangle OLD$ is required.

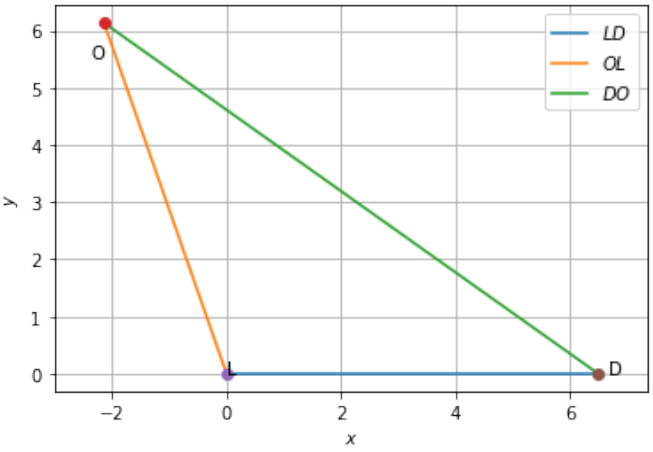

Fig. 2.1: Isosceles triangle $\triangle OLD$