

# 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>

So, the vertices of  $\triangle OLD$  are

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

Now, Isosceles  $\triangle OLD$  can be plotted using vertices  $LD$ ,  $OL$  and  $DO$ .

Plot of the Isosceles  $\triangle OLD$  is required.

## 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  $110^\circ$ .

## 2 SOLUTION

The vertices are:

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

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

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

$$(here, a = ol = 6.5) \quad (2.0.3)$$

$$\mathbf{OD} = (13) \cos(35) = 10.6 \quad (2.0.4)$$

Coordinates of  $O(p1, q1)$

$$\mathbf{p1} = \frac{ld^2 + ol^2 - od^2}{2(ld)} \quad (2.0.5)$$

$$\mathbf{p1} = \frac{(6.5)^2 + (6.5)^2 - (10.6)^2}{2(6.5)} \quad (2.0.6)$$

$$\mathbf{p1} = \frac{42.25 + 42.25 - 112.36}{13} \quad (2.0.7)$$

$$\Rightarrow p1 = -2.14 \quad (2.0.8)$$

$$\mathbf{q1} = \sqrt{(ol)^2 - (p1)^2} \quad (2.0.9)$$

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

$$\Rightarrow q1 = 6.13 \quad (2.0.11)$$

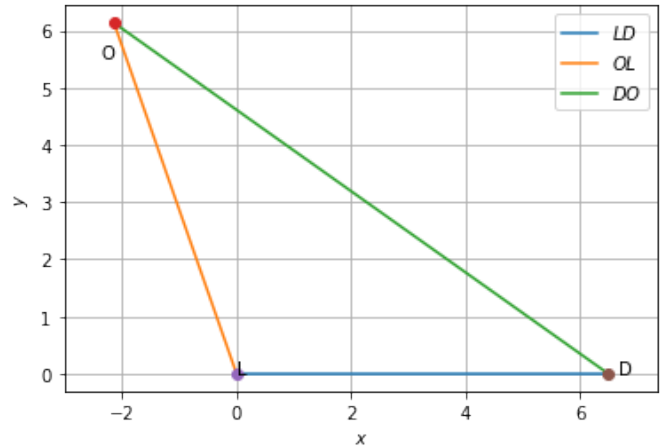


Fig. 2.1: Isosceles triangle  $\triangle OLD$