

# Assignment 2

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Download all python codes from

<https://github.com/grajanarsavva/Matrix-theory/codes>

and latex-tikz codes from

<https://github.com/grajanarsavva/Matrix-theory>

therefore the vertices of rhombus :

$$\mathbf{O} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (2.0.3)$$

$$\mathbf{A} = \begin{pmatrix} 0 \\ -4.6 \end{pmatrix} \quad (2.0.4)$$

$$\mathbf{B} = \begin{pmatrix} 3.5 \\ 0 \end{pmatrix} \quad (2.0.5)$$

$$\mathbf{C} = \begin{pmatrix} 4.6 \\ 0 \end{pmatrix} \quad (2.0.6)$$

$$\mathbf{D} = \begin{pmatrix} 0 \\ -3.5 \end{pmatrix} \quad (2.0.7)$$

## 1 QUESTION No. 2.45

Can you construct a Rhombus ABCD with AC=6 and BD=7 ?

## 2 EXPLANATION

- 1) Assume vertices of given rhombus :-  
Let the vertices of rhombus ABCD be **A,B,C** and **D** .
- 2) List out give data in form vectors :-  
According to given data:

$$\|\mathbf{A} - \mathbf{C}\| = 6 \quad (2.0.1)$$

$$\|\mathbf{B} - \mathbf{D}\| = 7 \quad (2.0.2)$$

- 3) Find out two triangles of given rhombus having same base

Rhombus ABCD is made of two triangles  $\triangle ABC$  and  $\triangle ACD$  placed on base AC .

From  $\triangle ACD$  ,Consider another  $\triangle AOB$  and  $\triangle BOD$  ,both are right angled triangle.

By pythagorean theorem:

$$\|\mathbf{A} - \mathbf{B}\|^2 = \|\mathbf{A} - \mathbf{O}\|^2 + \|\mathbf{O} - \mathbf{B}\|^2$$

$$= (3)^2 + (3.5)^2$$

$$= 21.25$$

$$\|\mathbf{A} - \mathbf{B}\| = \pm 4.6$$

Similarly

$$\|\mathbf{B} - \mathbf{C}\| = 4.6$$

$$\|\mathbf{C} - \mathbf{D}\| = 4.6$$

$$\|\mathbf{D} - \mathbf{A}\| = 4.6$$

By the property of Rhombus, All sides of rhombus are equal. The opposite sides of rhombus are parallel.

Plot the Rhombus ABCD is as follows:

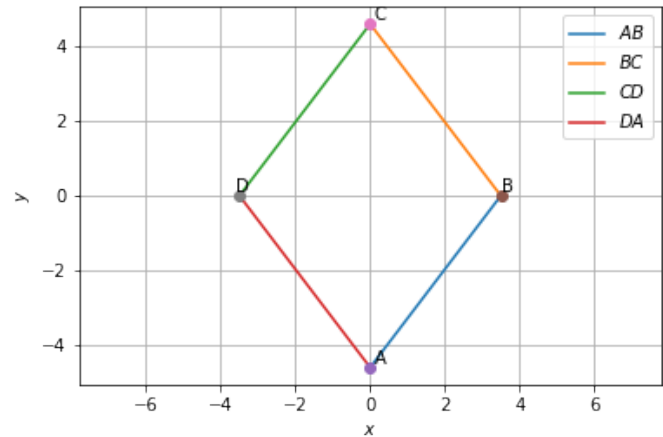


Fig. 2.1: Rhombus ABCD