

Assignment 1

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Find Python Codes from below link

<https://raw.githubusercontent.com/Venkatasaidhilli/IITH/main/SU/Assignment1/code.py>

and Latex codes from below link

<https://raw.githubusercontent.com/Venkatasaidhilli/IITH/main/SU/Assignment1/main.tex>

1 EXAMPLES 1

1.1 Question 1

If the point A(4, 3) and B(x, 5) are on the circle with the centre O(2, 3), find the value of x.

$$\text{Let, } \mathbf{A} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} x \\ 5 \end{pmatrix} \text{ and } \mathbf{O} = \begin{pmatrix} 2 \\ 3 \end{pmatrix} \quad (1.1.1)$$

1.2 Solution

Given the points are on the circle with center O
So OA and OB becomes the radius of the circle
Therefore OA = OB

$$\|\mathbf{O} - \mathbf{A}\| = \|\mathbf{O} - \mathbf{B}\| \quad (1.2.1)$$

From (1.2.1)

$$\sqrt{(\mathbf{O} - \mathbf{A})^T (\mathbf{O} - \mathbf{A})} = \sqrt{(\mathbf{O} - \mathbf{B})^T (\mathbf{O} - \mathbf{B})} \quad (1.2.2)$$

$$\sqrt{\begin{pmatrix} -2 & 0 \end{pmatrix} \begin{pmatrix} -2 \\ 0 \end{pmatrix}} = \sqrt{\begin{pmatrix} (2-x) & -2 \end{pmatrix} \begin{pmatrix} 2-x \\ -2 \end{pmatrix}} \quad (1.2.3)$$

$$\sqrt{(-2)^2 + 0} = \sqrt{(2-x)^2 + (-2)^2} \quad (1.2.4)$$

$$4 = (2-x)^2 + 4 \quad (1.2.5)$$

$$(2-x)^2 = 0 \quad (1.2.6)$$

$$(2-x) = 0 \quad (1.2.7)$$

$$x = 2$$

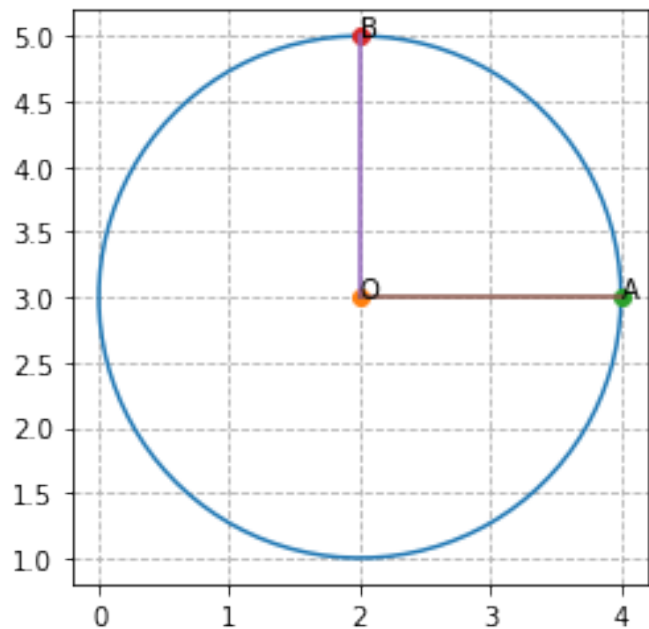


Fig. 0