

CHAPTER 7 - COORDINATE GEOMETRY

Exercise 7.2

Q7. Find the coordinates of point A, where AB is the diameter of a circle where the center is (2,-3) and B is the point (1,4):

Solution:

1. The coordinates B and center C are given, where:

$$\mathbf{B} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}, \quad (1)$$

Let us assume the coordinates of A. Now, C is the center which is midpoint of line AB and B is one of the coordinate of diameter AB of a circle.

Hence,

$$\mathbf{C} = \frac{\mathbf{A} + \mathbf{B}}{2} \quad (2)$$

$$2\mathbf{C} = \mathbf{A} + \mathbf{B} \quad (3)$$

$$\mathbf{A} = 2\mathbf{C} - \mathbf{B} \quad (4)$$

$$\mathbf{A} = 2 \begin{pmatrix} 2 \\ -3 \end{pmatrix} - \begin{pmatrix} 1 \\ 4 \end{pmatrix} \quad (5)$$

$$\mathbf{A} = \begin{pmatrix} 4 \\ -6 \end{pmatrix} - \begin{pmatrix} 1 \\ 4 \end{pmatrix} \quad (6)$$

$$\mathbf{A} = \begin{pmatrix} 4 - 1 \\ -6 - 4 \end{pmatrix} \quad (7)$$

$$\mathbf{A} = \begin{pmatrix} 3 \\ -10 \end{pmatrix} \quad (8)$$

Therefore, the coordinates of A for value for given point $\mathbf{B}(1, 4)$ and center $\mathbf{C}(2, -3)$ given by $\mathbf{A}(3, -10)$.

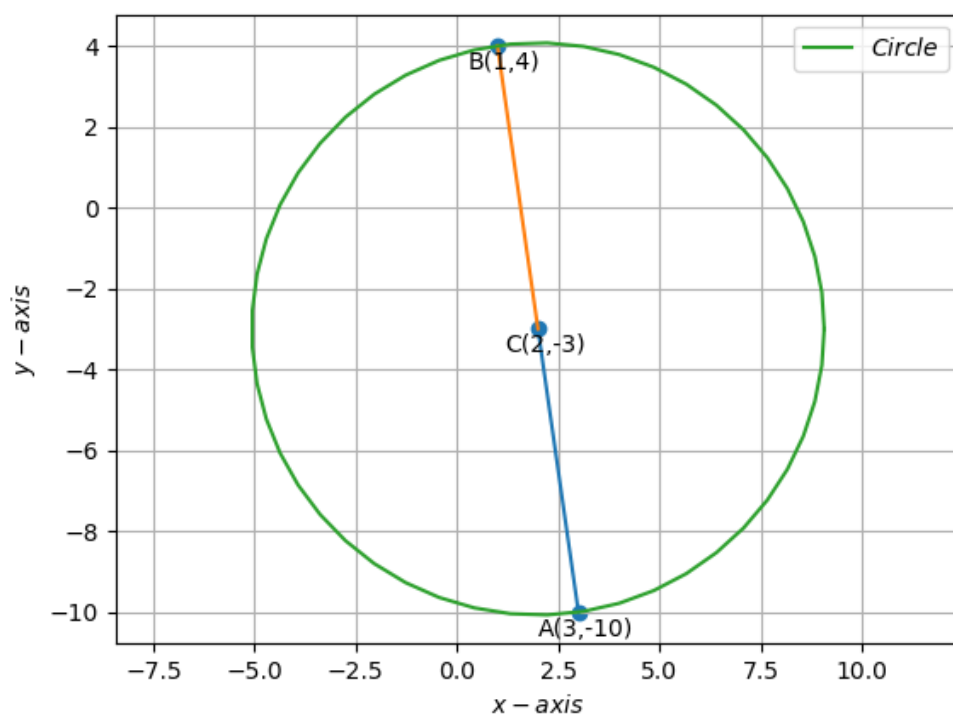


Figure 1: Circle for the given coordinates