

Matrix theory

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Question: Find the coordinates of a point A where AB is a diameter of the circle with center (3, -1) and the point B is (2, 6).

Point	Value	Description
C	(3, -1)	Centre of the circle
B	(2, 6)	Given point B
A	(x, y)	Coordinates of A

TABLE 0: Variables Used

Solution: Given,

Center of the circle **C** = (3, -1), and point **B** = (2, 6).

Let the coordinates of point **A** be (x, y). Since AB is the diameter of the circle, the center is the midpoint of **A** and **B**.

$$\mathbf{C} = \frac{\mathbf{A} + \mathbf{B}}{2} \quad (1)$$

$$= \frac{\begin{pmatrix} x \\ y \end{pmatrix} + \begin{pmatrix} 2 \\ 6 \end{pmatrix}}{2} \quad (2)$$

$$= \left(\frac{x+2}{2}, \frac{y+6}{2} \right) \quad (3)$$

Given the centre of the circle **C** is (3,-1), we can write

$$\left(\frac{x+2}{2}, \frac{y+6}{2} \right) = (3, -1) \quad (4)$$

By solving these two equations we get:

$$x = 4 \quad (5)$$

$$y = -8 \quad (6)$$

Therefore, the coordinates of point **A** are (4, -8).

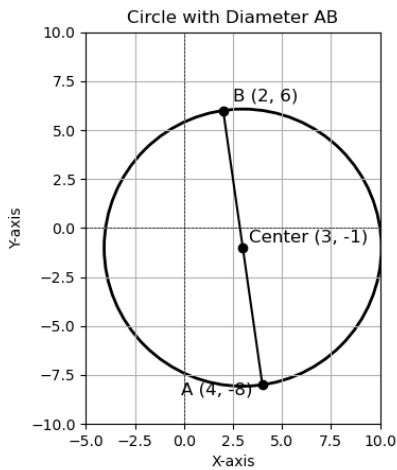


Fig. 0: Graph of the Circle with Diameter AB