11.11.1.13

Question : Find the equation of the circle with radius 5 whose centre lies on x-axis and passes through the point $(2, 3)$.

Solution :

Input parameters	Description	Value
O	Center	$\begin{pmatrix} 6 \\ 0 \end{pmatrix}$
A	Point	$\begin{pmatrix} 2 \\ 3 \end{pmatrix}$

Table 1: Table of input parameters

The general formula of the circle is

$$||\mathbf{x}||^2 + 2\mathbf{u}^\top \mathbf{x} + f = 0 \tag{1}$$

$$where, \mathbf{u} = -\begin{pmatrix} 6 \\ 0 \end{pmatrix} \tag{2}$$

$$||\mathbf{A}||^2 + 2\mathbf{u}^\top \mathbf{A} + f = 0 \tag{3}$$

$$or, f = 11 \tag{4}$$

Therefore the equation of the circle is

$$||\mathbf{x}||^2 - 2\begin{pmatrix} 6 & 0 \end{pmatrix}\mathbf{x} + 11 = 0 \tag{5}$$

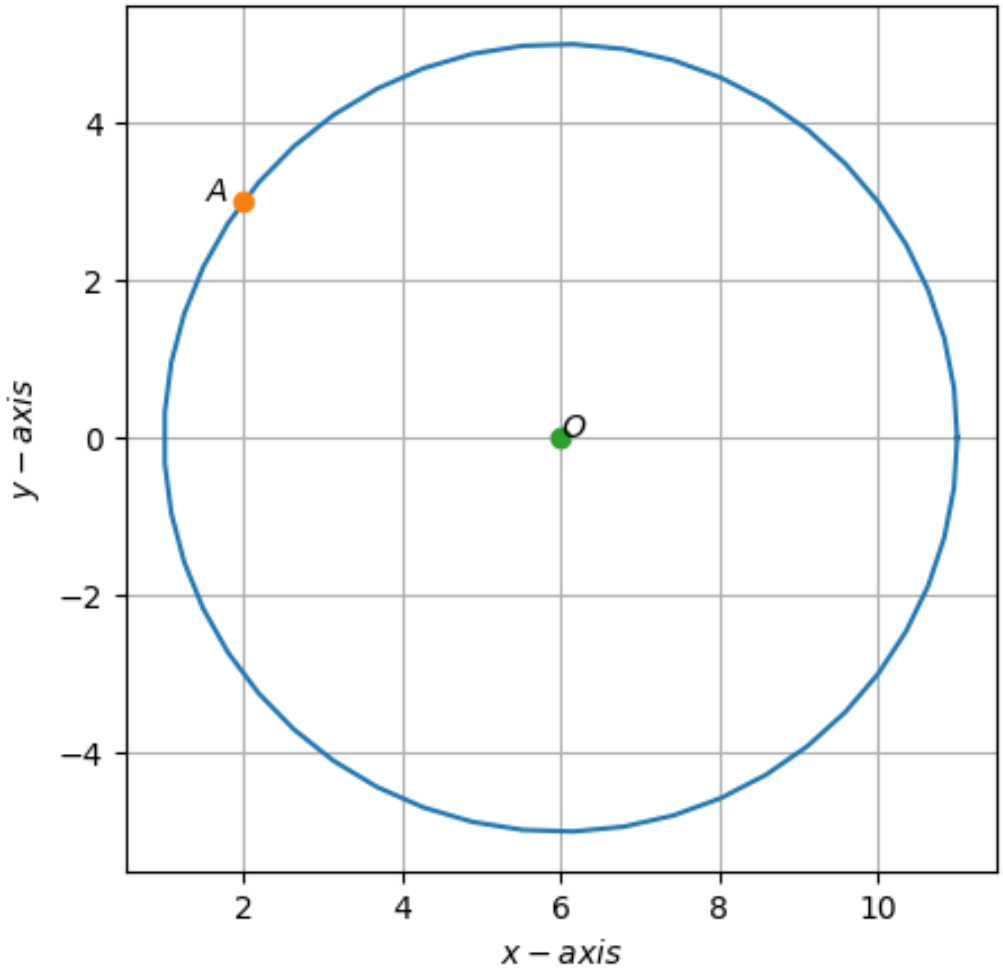

Figure 1: