Circles

1 11^{th} Maths - Exercise 11.1.9

1. Find the centre and radius of the given circle $2x^2 + 2y^2 - x = 0$

2 Solution

The given equation can be arranged as

$$x^2 + y^2 - \frac{x}{2} = 0 \tag{1}$$

The general equation of the circle is

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

by using above equation

$$\|\mathbf{x}\|^2 + 2\begin{pmatrix} \frac{-1}{4} & 0 \end{pmatrix}\mathbf{x} = 0 \tag{3}$$

The centre of circle is given as

$$\mathbf{u} = -\mathbf{c} \tag{4}$$

$$\mathbf{c} = \begin{pmatrix} \frac{1}{4} \\ 0 \end{pmatrix} \tag{5}$$

The radius of circle is given as

$$f = \|\mathbf{u}\|^2 - r^2 \tag{6}$$

$$r = \frac{1}{4} \tag{7}$$

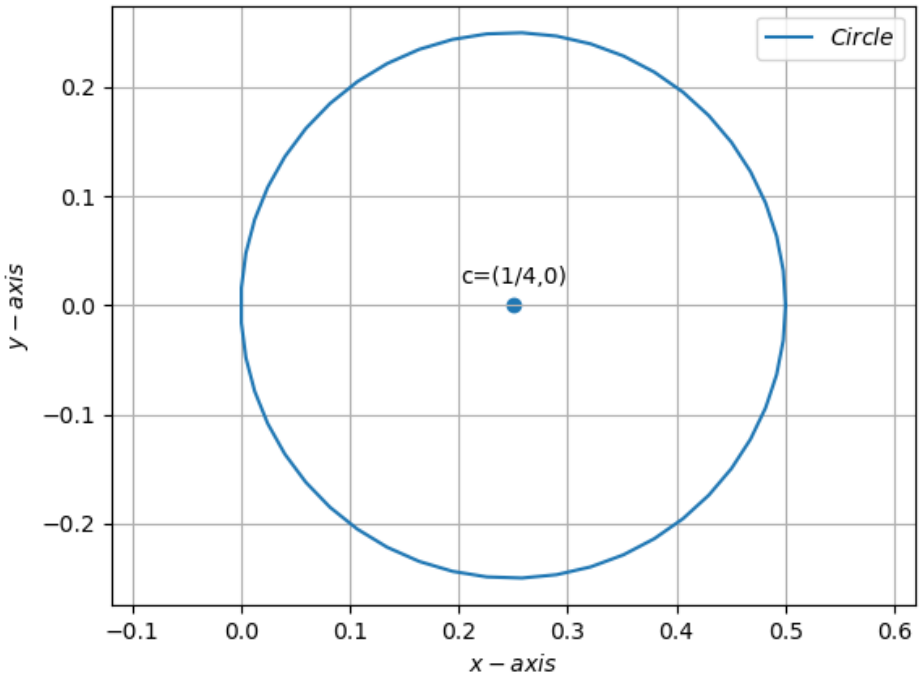

Figure 1