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In each of the following Exercise 1 to 5, find the equation of the circle with

1. Centre (0, 2) and radius 2

Solution:

Given:

Centre (0, 2) and radius 2

Let us consider the equation of a circle with centre (h, k) and

Radius r is given as $(x - h)^2 + (y - k)^2 = r^2$

So, centre (h, k) = (0, 2) and radius (r) = 2

The equation of the circle is

$(x - 0)^2 + (y - 2)^2 = 2^2$

$x^2 + y^2 + 4 - 4y = 4$

$x^2 + y^2 - 4y = 0$

∴ The equation of the circle is $x^2 + y^2 - 4y = 0$

2. Centre (–2, 3) and radius 4

Solution:

Given:

Centre (-2, 3) and radius 4

Let us consider the equation of a circle with centre (h, k) and

Radius r is given as $(x - h)^2 + (y - k)^2 = r^2$

So, centre (h, k) = (-2, 3) and radius (r) = 4

The equation of the circle is

$(x + 2)^2 + (y - 3)^2 = (4)^2$

$x^2 + 4x + 4 + y^2 - 6y + 9 = 16$

$x^2 + y^2 + 4x - 6y - 3 = 0$

∴ The equation of the circle is $x^2 + y^2 + 4x - 6y - 3 = 0$

3. Centre (1/2, 1/4) and radius (1/12)

Solution:

Given:

Centre (1/2, 1/4) and radius 1/12

Let us consider the equation of a circle with centre (h, k) and

Radius r is given as $(x - h)^2 + (y - k)^2 = r^2$

So, centre (h, k) = (1/2, 1/4) and radius (r) = 1/12

The equation of the circle is

$(x - 1/2)^2 + (y - 1/4)^2 = (1/12)^2$

$x^2 - x + ¼ + y^2 - y/2 + 1/16 = 1/144$

$x^2 - x + ¼ + y^2 - y/2 + 1/16 = 1/144$

$144x^2 - 144x + 36 + 144y^2 - 72y + 9 - 1 = 0$

$144x^2 - 144x + 144y^2 - 72y + 44 = 0$

$36x^2 + 36x + 36y^2 - 18y + 11 = 0$

$36x^2 + 36y^2 - 36x - 18y + 11 = 0$

∴ The equation of the circle is $36x^2 + 36y^2 - 36x - 18y + 11 = 0$