

Equations of Circles

The general form of an equation of a circle is:

$$(x - a)^2 + (y - b)^2 = r^2$$

r is the radius and the circle is centered at (a, b)

In some cases, the equation may need to be factored before it will look like something in the above form:

$$x^2 + 2x + 1 + y^2 + 4y + 3 = 0$$

$$(x + 1)^2 + y^2 + 4y + 4 - 1 = 0$$

$$(x + 1)^2 + (y + 2)^2 = 1$$

Now, we can tell that the equation is for a circle centered at $(-1, -2)$ with a radius of 1 . It would be hard to tell this just by looking at the original equation!

Try going through these problems, identifying the radius and center of each circle, or finding an equation with the properties specified.

1. $(x - 2)^2 + (y - 10)^2 = 4$

2. Write an equation of a circle centered at $(5, 4)$, with radius $\sqrt{5}$

3. $(x - 5)^2 + (y - 1)^2 = 22$

4. $x^2 - 6x + 9 + y^2 - 2y + 1 = 9$

5. $y^2 + 18y + 81 + x^2 + 20x + 100 = 25$

6. Write an equation of a circle centered at $(-\sqrt{5}, \sqrt{5})$, with a radius of 3 .

7. $x^2 + 10x + y^2 + 8y = 23$

8. Write an equation of a circle centered at $(10, 1)$, with radius 11

9. $x^2 - 2\sqrt{3}x + 3 + y^2 + 2\sqrt{5}y + 5 = 25$

10. $x^2 + y^2 - 2x + 6y = -7$