

Circles

Equation of a Circle

An equation of the circle with center (h, k) and radius r is

$$(x - h)^2 + (y - k)^2 = r^2 \text{ (the standard form)}$$

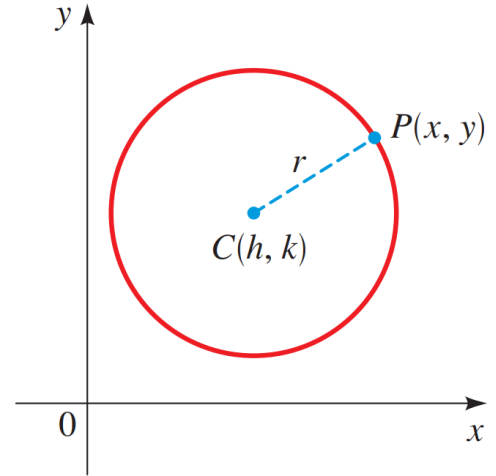
- If the center of the circle is the origin $(0, 0)$ then the equation is

$$x^2 + y^2 = r^2$$

- If the equation of a circle is in **General Form**

$$x^2 + y^2 + ax + by + c = 0$$

⇒ Complete the Squares in x and y to get the standard form



Example 1: Find an equation of the circle that satisfies the given conditions.

(a) Center $(2, -1)$; radius 3

(b) Endpoints of a diameter are $P(-1, 1)$ and $Q(5, 9)$



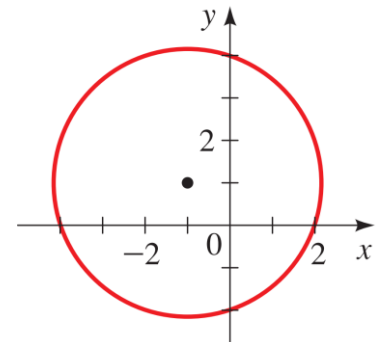


Example 2: Find the center and radius of the circle.

- $x^2 + y^2 = 9$

- $(x + 1)^2 + (y + 2)^2 = 36$

Example 3: Find the equation of the circle shown in the figure.



Example 4: Show that the equation represents a circle and find the center and radius of the circle.

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

- $x^2 + y^2 + 4x - 6y + 12 = 0$

