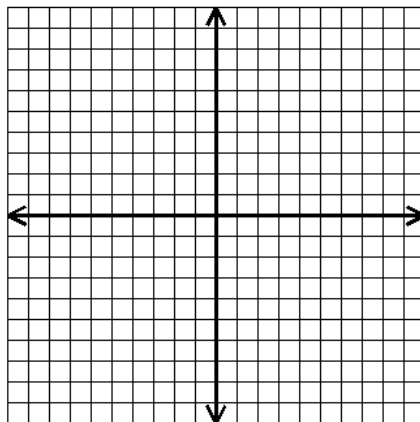


TOPIC 14-5: CIRCLES IN THE COORDINATE PLANE

A **circle** is the set of all points in a plane that are a fixed distance, called the **radius**, from a fixed point, called the **center**. So, the circle is all the points (x, y) that are “ r ” units away from the center (h, k) .

Equation of a circle in standard form:



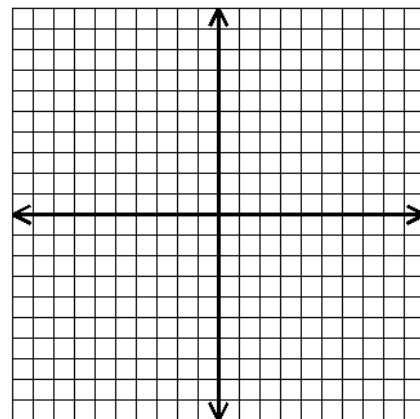
$$(x - h)^2 + (y - k)^2 = r^2$$

center: (h, k)

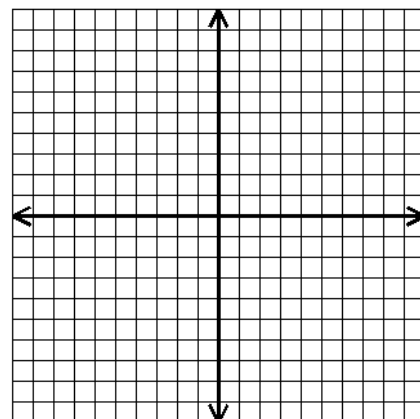
radius: r

EXAMPLE 1: Draw the graphs of the circles with the following equations.

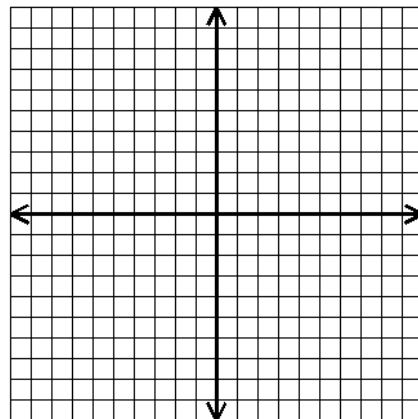
a) $x^2 + y^2 = 16$



b) $(x + 2)^2 + (y - 5)^2 = 9$



c) $4x^2 + 4(y + 2)^2 = 124$



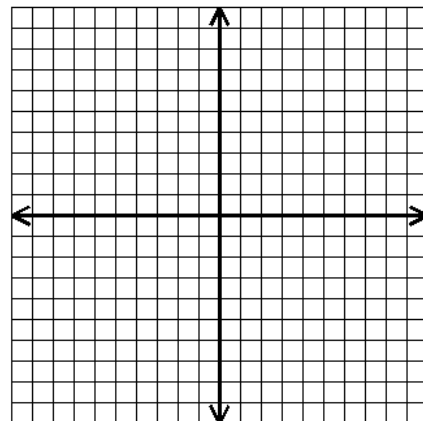
EXAMPLE 2: Use the information given to write the equation of the following circles.

a) Center at $(4, 2)$ with a radius of 6.

b) Center at $(-2, 3)$ with a radius of $2\sqrt{3}$.

EXAMPLE 3: Graph the following circle. What is the center and the radius? Find the circumference and area of the circle.

$$(x - 7)^2 + (y + 5)^2 - 9 = 0$$



EXAMPLE 4: Plot the following circle on your calculator:

$$x^2 + y^2 = 25$$