**Section 2.8—Distance & Midpoint Formulas, and Circles**

**Distance Formula**—the distance, d, between the points in the rectangular coordinate system is

.

**Distance is never negative.**

**Example**—Find the distance between and .

**Midpoint Formula**—If a segment has endpoints of , then the coordinates of the segment’s midpoint are

.

**Example**—Find the midpoint of the line segment with coordinates and .

**Circle**—a set of all points in a plane that are equidistant from a fixed point

**Center**—the fixed point in a circle

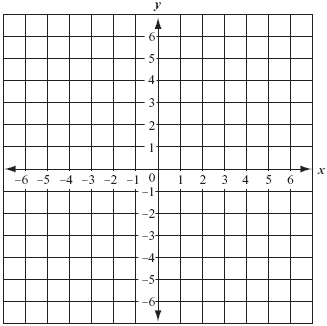
**Radius**—the fixed distance from a circle’s center to any point that lies on the circle

**Standard Form of the Equation of a Circle**—

with center and radius r.

**Example**—write the standard form of the equation of the circle with:

1. center and radius 4
2. center and radius 10

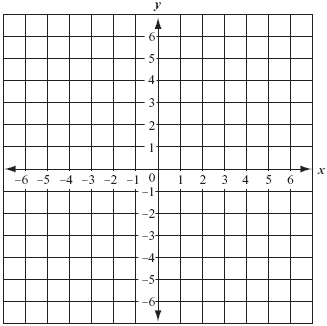
**Example**—

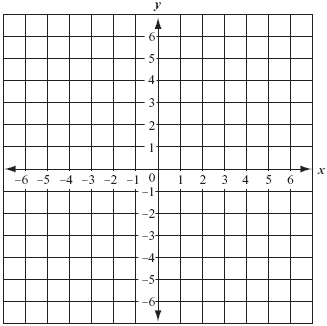
1. Find the center and radius of the circle whose equation is
2. Graph the circle
3. Use the graph to identify the relation’s domain and range.

**General Form of an Equation**—

where D, E, and F are real numbers.

**Example**—Write each of the following in standard form, graph the circle, and give the domain and range:





.