

Circles

A circle is the set of all points (x,y) that are equidistant from a fixed point, called the center of the circle.

The distance r between the center and any point (x,y) on the circle is the radius.

The point (h, k) is the center of the circle.

The standard form of the equation of a circle is

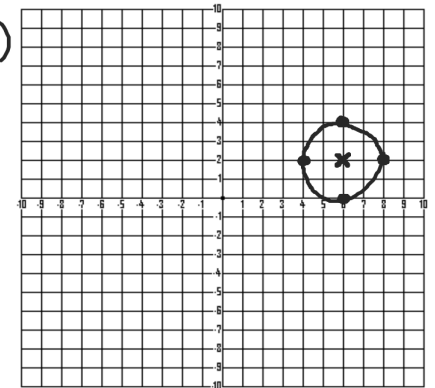
$$(x - h)^2 + (y - k)^2 = r^2$$

Graph $(x - 6)^2 + (y - 2)^2 = 4$

center \swarrow
 $r^2 \searrow$

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

1. Identify the Center (h, k) : $(6, 2)$
2. Find the radius: $r = 2$
3. Plot 4 points that are a radius away from the center.
4. Draw a circle through the points.

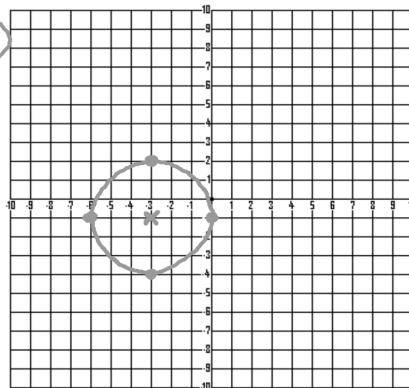


Graph $(x + 3)^2 + (y + 1)^2 = 9$

center \swarrow
 $r^2 \searrow$

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

1. Identify the Center (h, k) : $(-3, -1)$
2. Find the radius: $r = 3$
3. Plot 4 points that are a radius away from the center.
4. Draw a circle through the points.

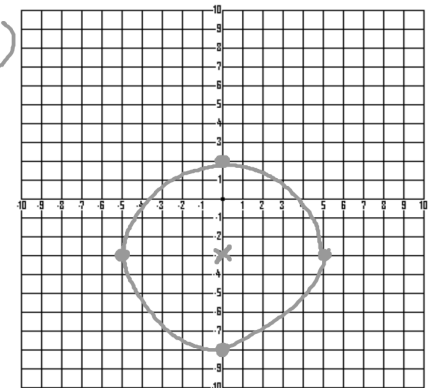


Graph $x^2 + (y + 3)^2 = 25$

0

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

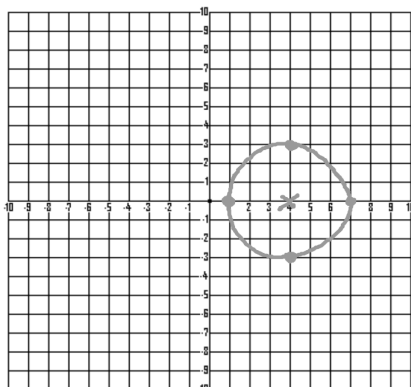
1. Identify the Center (h, k) : $(0, -3)$
2. Find the radius: $r = 5$
3. Plot 4 points that are a radius away from the center.
4. Draw a circle through the points.



Graph $(x - 4)^2 + y^2 = 9$

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

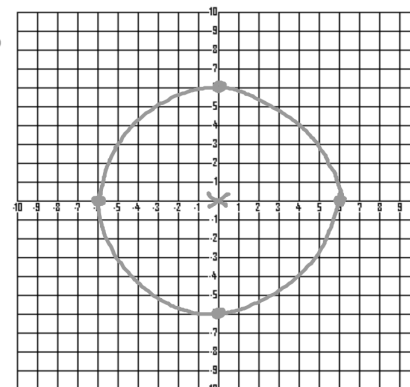
1. Identify the Center (h, k): $(4, 0)$
2. Find the radius: $r = 3$
3. Plot 4 points that are a radius away from the center.
4. Draw a circle through the points.



Graph $x^2 + y^2 = 36$

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

1. Identify the Center (h, k): $(0, 0)$
2. Find the radius: $r = 6$
3. Plot 4 points that are a radius away from the center.
4. Draw a circle through the points.



Writing the equation of a circle:

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

1. Center is (9, 3) and a radius of 4.

$$(x - 9)^2 + (y - 3)^2 = 16$$

2. Center is (-4, 2) and a radius of 3.

$$(x + 4)^2 + (y - 2)^2 = 9$$

3. Center is (5, -6) and a radius of 5.

$$(x - 5)^2 + (y + 6)^2 = 25$$

4. Center is (0, 4) and a radius of 7.

$$(x + 0)^2 + (y - 4)^2 = 49 \rightarrow x^2 + (y - 4)^2 = 49$$

5. Center is (0, 0) and a radius of 9.

$$x^2 + y^2 = 81$$

6. Center is (-8, 0) and a radius of 11.

$$(x + 8)^2 + y^2 = 121$$