

# Graphing Circles

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# Standard form of an equation of a circle

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

where  $(h,k)$  is the center of the circle and  $r$  is the radius

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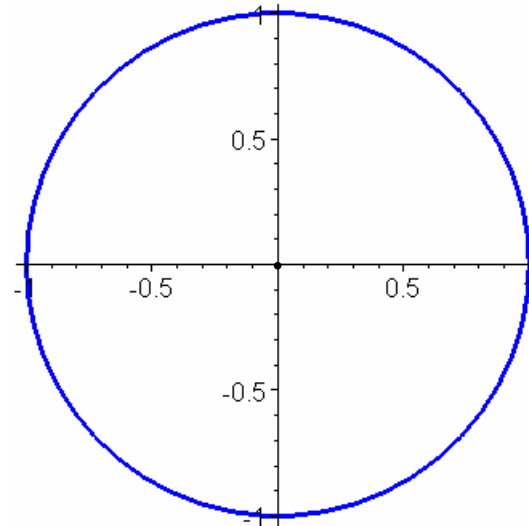
$$x^2 + y^2 = r^2$$

where the center of the circle is at the origin (0,0) and with a radius of r.

# Unit Circle equation

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

where the center of the circle is at the origin (0,0) and with a radius of 1, is called the unit circle.



Since the radius = 1, use the center (0,0) as a reference point and then move 1 point to the left, right, up and down.

# Graphing a Circle

Given the following equation

$$(x+3)^2 + (y-5)^2 = 36$$

Recall the standard form of an equation of a circle

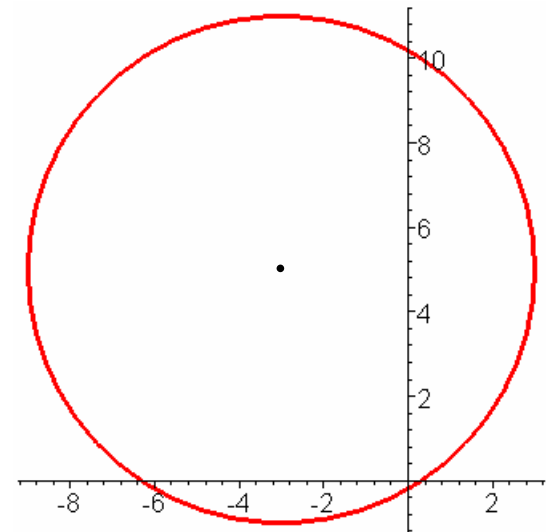
$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x-(-3))^2 + (y-5)^2 = 6^2$$

Therefore,  $h=-3$ ,  $k=5$ , and  $r=6$ .

The center of the circle  $(-3, 5)$  with a radius of 6.

Since the radius = 6, use the center  $(-3, 5)$  as a reference point and then move 6 points to left, right, up and down.



# Graph

$$(x-4)^2 + (y+3)^2 = 25$$

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Recall the standard form of an equation of a circle

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

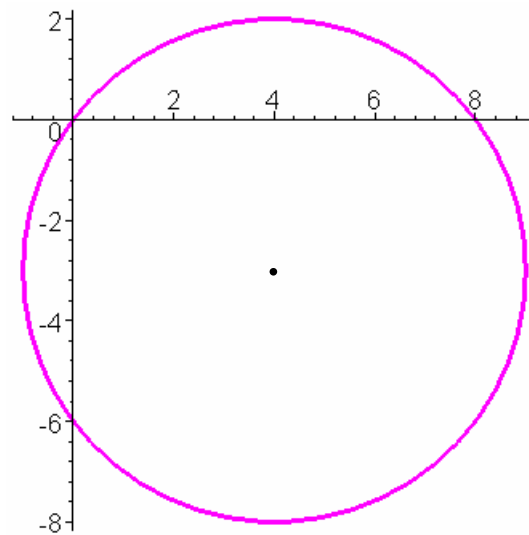
$$(x-4)^2 + (y-(-3))^2 = 5^2$$

Find the center  $(4,-3)$

Find the radius  $5$

Then graph

Since the radius =  $5$ , use the center  $(4,-3)$  as a reference point and then move  $5$  points to left, right, up and down.



# Graph

$$(x-2)^2 + (y-4)^2 = 16$$



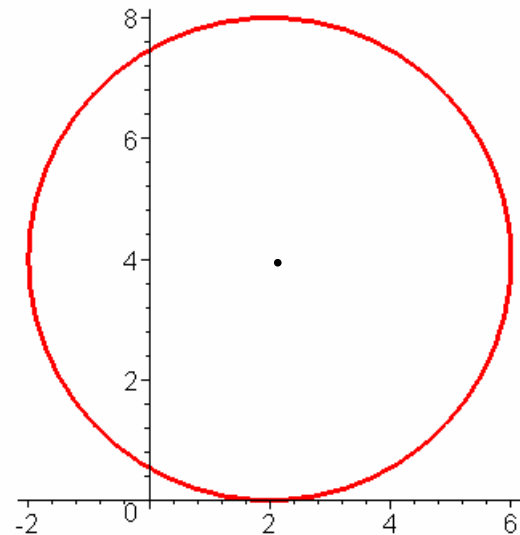
$$(x-2)^2 + (y-4)^2 = 16$$

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

Center (2,4)

Radius 4

Since the radius = 4, use the center (2,4) as a reference point and then move 4 points to left, right, up and down.



# Graph

$$(x+3)^2 + (y-7)^2 = 49$$

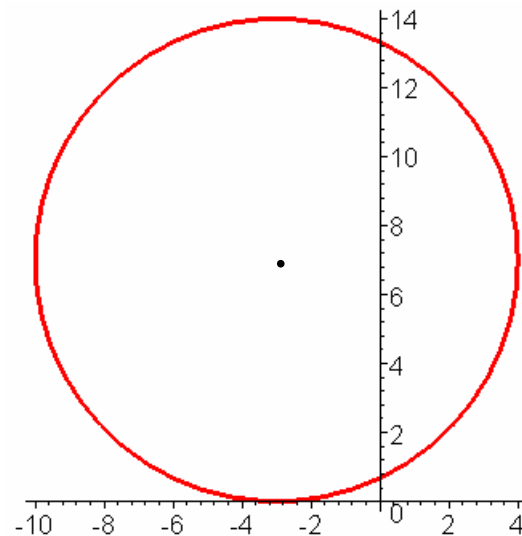
$$(x+3)^2 + (y-7)^2 = 49$$

$$(x - (-3))^2 + (y - 7)^2 = 7^2$$

Center  $(-3, 7)$

Radius 7

Since the radius = 7, use the center  $(-3, 7)$  as a reference point and then move 7 points to left, right, up and down.



# Graph

$$(x-5)^2 + (y+4)^2 = 4$$

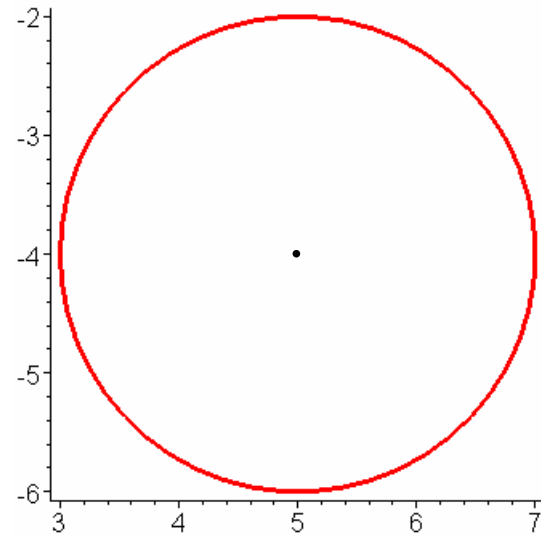
$$(x-5)^2 + (y+4)^2 = 4$$

$$(x-5)^2 + (y-(-4))^2 = 2^2$$

Center (5,-4)

Radius 2

Since the radius = 2, use the center (5,-4) as a reference point and then move 2 points to left, right, up and down.



# Graph

$$(x+9)^2 + (y+7)^2 = 81$$

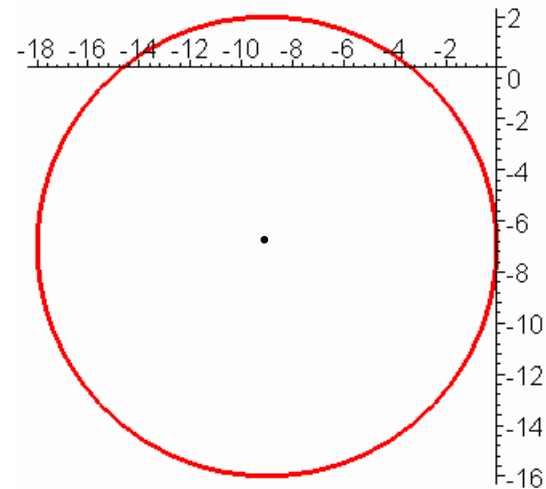
$$(x+9)^2 + (y+7)^2 = 81$$

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

Center  $(-9, -7)$

Radius 9

Since the radius = 9, use the center  $(-9, -7)$  as a reference point and then move 9 points to left, right, up and down.



# Graph

$$3(x+5)^2 + 3y^2 = 300$$



$$3(x + 5)^2 + 3y^2 = 300$$

$$\frac{3(x + 5)^2}{3} + \frac{3y^2}{3} = \frac{300}{3}$$

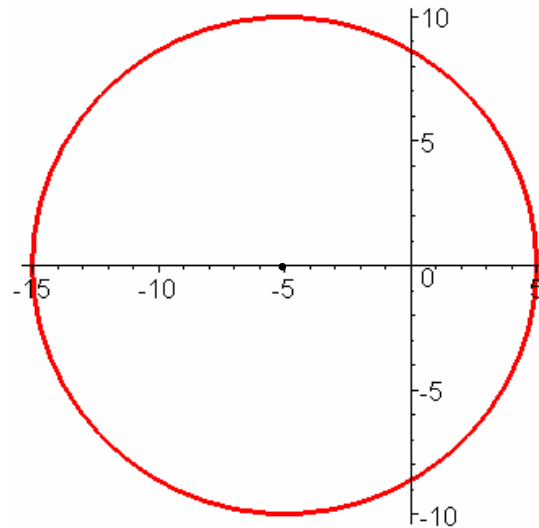
$$(x + 5)^2 + y^2 = 100$$

$$(x - (-5))^2 + (y - 0)^2 = 10^2$$

Center (-5,0)

Radius 10

Since the radius = 10, use the center (-5,0) as a reference point and then move 10 points to left, right, up and down.



# Congratulations!!

You just completed  
**Graphing Circles**