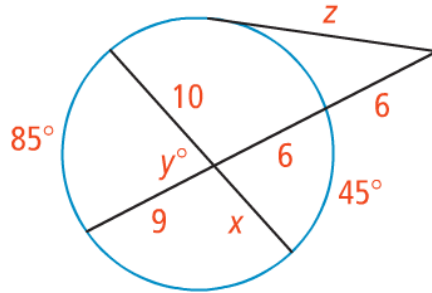
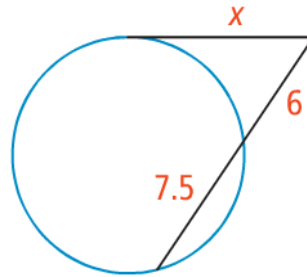


Warm Up:

1. What is the value of x ?
2. What is the value of y ?
3. What is the value of z , to the nearest tenth?



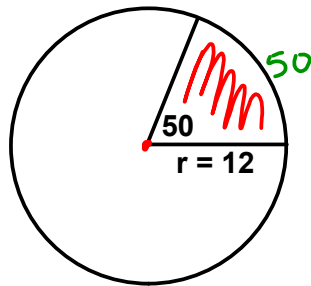
7. **Error Analysis** To find the value of x , a student wrote the equation $(7.5)6 = x^2$. What error did the student make?



Warm Up:

Leave answer in π

Find the area of the sector.



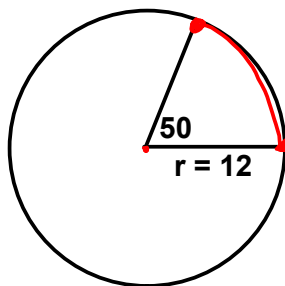
$$\frac{m\widehat{AB}}{360} \cdot \pi r^2$$

$$\frac{50}{360} \cdot \pi 12^2$$

$$.14 \cdot \pi \cdot 144$$

$$20.16\pi$$

Find the arc length



$$\frac{m\widehat{AB}}{360} \cdot 2\pi r^2$$

$$\frac{50}{360} \cdot 2\pi 12$$

$$.14 \cdot 24\pi$$

$$3.36\pi$$

Learning Goal: Today I will learn how to write the equation of a circle.

Success Criteria: I am able to use a circle or a point(s) on a circle to write an equation.

12-5 Circles in a Co-ordinate Plane

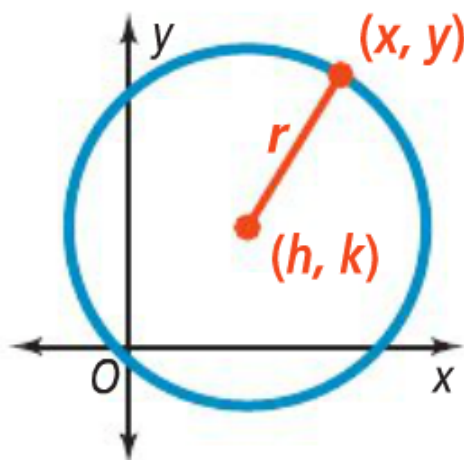
Theorem 12-16

Standard form with the center at (h, k) and a radius of r .

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

\uparrow
x co-ord
center

\uparrow
y co-ord
center



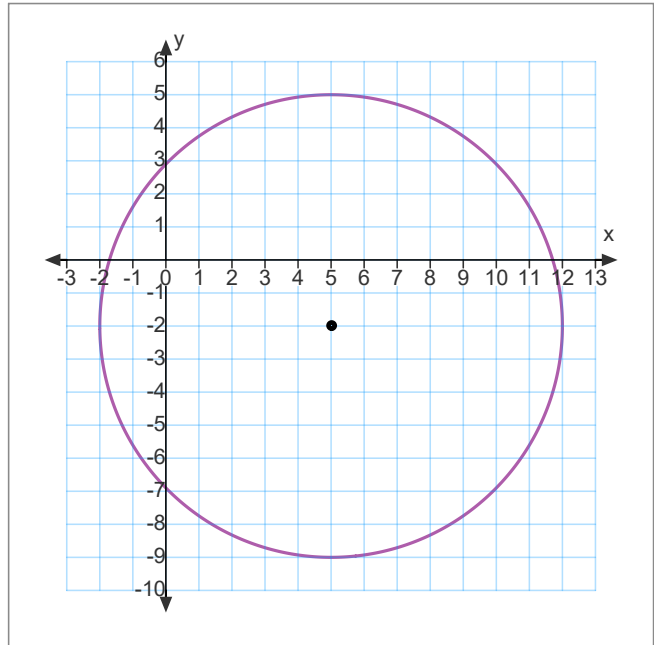
Circles

Given a circle with the center at $(5, -2)$ and a radius of 7 , what is the equation of the circle?

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

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

$$(x-5)^2 + (y+2)^2 = 49$$



Circles

1. Write the standard equation of the circle with center $(2, 6)$ and radius of 12 .

2. Write the standard equation of the circle with center $(-5, -4)$ and radius of $\sqrt{3}$.

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

$$(x--5)^2 + (y--4)^2 = (\sqrt{3})^2$$

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

Circles

Use the graph to find both the center $(0, -4)$ and radius $\underline{6}$.

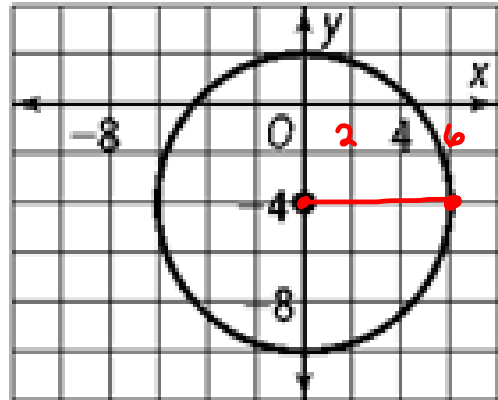
h k

r

Write the equation of the circle.

$$(x-0)^2 + (y-(-4))^2 = 6^2$$

$$x^2 + (y+4)^2 = 36$$

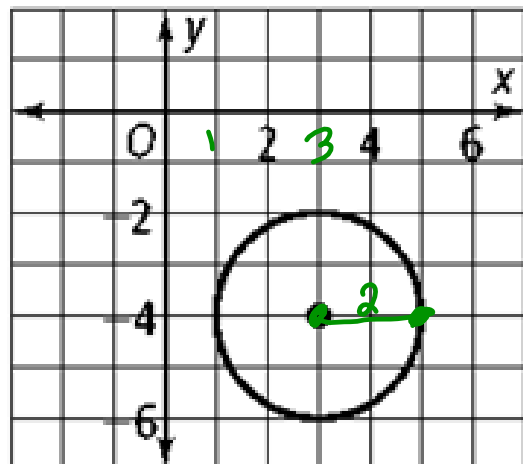


Circles

Write the equation of this circle.

center $(3, -4)$ $r = 2$

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



Circles

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

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

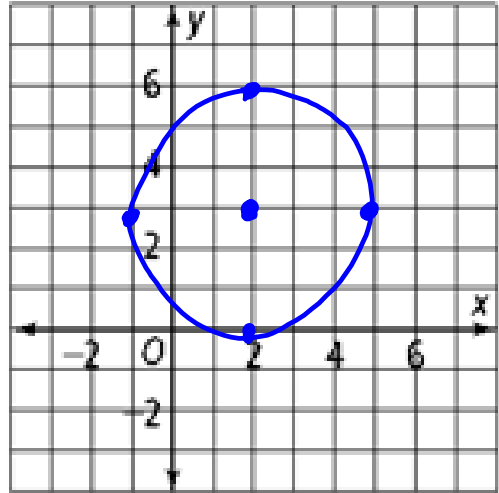
Find the center (2, 3) and plot that point.

h, k

Find the radius 3.

$$\sqrt{r^2} = \sqrt{9}$$

Sketch or use a compass to draw a circle with that radius.



Write the standard equation of the circle with the given center that passes through the given point.

center $(1, 2)$; point $(0, 6)$

h k

$x_1 y_1$

$x_2 y_2$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(0 - 1)^2 + (6 - 2)^2}$$

$$d = \sqrt{(-1)^2 + 4^2}$$

$$d = \sqrt{1 + 16}$$

$$d = \sqrt{17} = r$$

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

$$(x - 1)^2 + (y - 2)^2 = (\sqrt{17})^2$$

$$(x - 1)^2 + (y - 2)^2 = 17$$



Write an equation of a circle with a diameter \overline{AB} .

$$A(3, 0), B(7, 6)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

x_1, y_1 x_2, y_2

$$d = \sqrt{(7-3)^2 + (6-0)^2}$$

$$d = \sqrt{4^2 + 6^2}$$

$$d = \sqrt{16+36}$$

$$d = \sqrt{52} = 7.2 = \text{diameter}$$

$$r = \frac{7.2}{2} = 3.6$$

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

$$(x-5)^2 + (y-3)^2 = (3.6)^2$$

$$(x-5)^2 + (y-3)^2 = 12.96$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\text{MIDPOINT} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

*write formulas on green sheet!

$$\left(\frac{3+7}{2}, \frac{0+6}{2} \right)$$

$$\left(\frac{10}{2}, \frac{6}{2} \right) = (5, 3)$$

h, k

Closure: Today I learned how to write the equation of a circle.

Don't forget to flip your sign!