

Geometry

Chapter 12

Section 12-5

May 13-8:35 AM

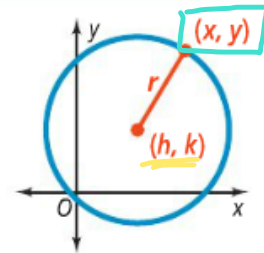
take note

Theorem 12-16 Equation of a Circle

An equation of a circle with center (h, k) and radius r is

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

Standard Form



Variable $\rightarrow x, y$
constant $\rightarrow h, k, r$

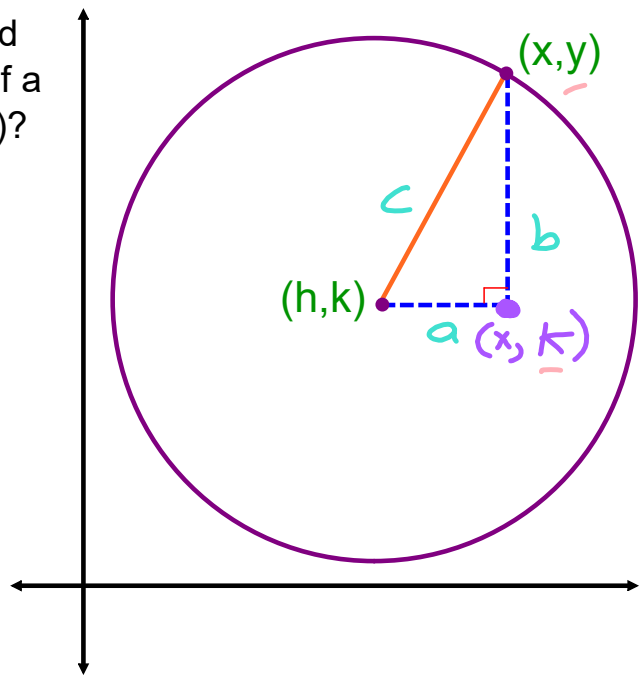
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On a cartesian graph, how would you find the length of the radius of a circle with the known center (h,k) ?

$$a = x - h$$

$$b = y - k$$

$$c = r$$



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What are the center of the circle and the radius?

$$(x - 2)^2 + (y + 1)^2 = 16$$

$$\text{center: } (2, -1)$$

$$r: 4$$

$$\sqrt{r^2} = \sqrt{16}$$

$$r = 4$$

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Write the standard equation for each circle with the given center and radius.

Center: (4, 8)

Radius: 3

$$(x-4)^2 + (y-8)^2 = 9$$

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Write the standard equation for each circle with the given center and radius.

Center: (0, -3)

Radius: $\sqrt{5}$

$$(x-0)^2 + (y+3)^2 = 5$$

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Write the standard equation for each circle with the given center and passing through the given point.

Center: (3, -5)

Point: (1, -5)

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

$$(1-3)^2 + (-5+5)^2 = r^2$$

$$(-2)^2 + (0)^2 = r^2$$

$$4 = r^2$$

$$\star 2 = r$$

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Write the standard equation for each circle with the given center and passing through the given point.

Center: (6, 9)

(x, y) ← Point: (-2, 3)

$$(x-6)^2 + (y-9)^2 = 100$$

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Write the standard equation for each circle whose diameter has the given endpoints.

Points: (2, 5) ; (10, -1)

$$\frac{2+10}{2}$$

$$\frac{5+(-1)}{2}$$

$$(h, k) = (6, 2)$$

$$(10-6)^2 + (-1-2)^2 = r^2$$

$$16 + 9 = r^2$$

$$25 = r^2$$

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

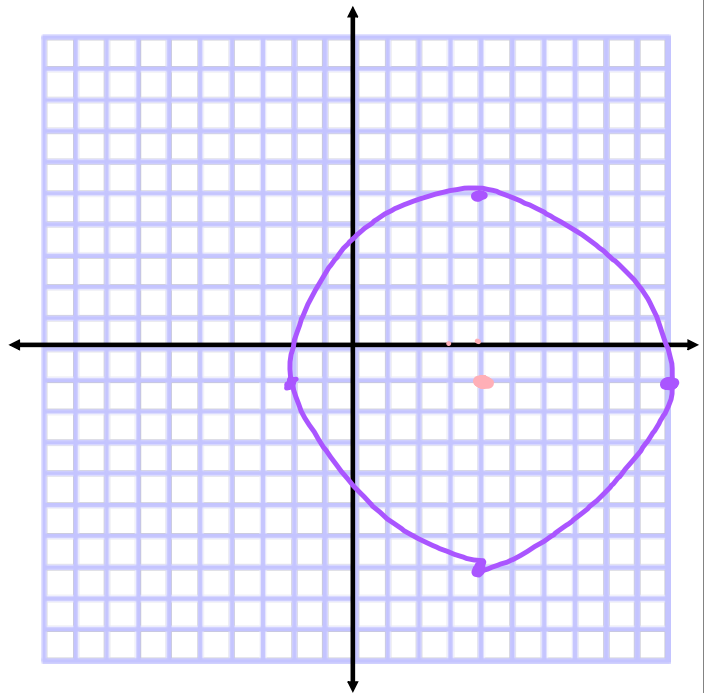
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Graph the circle with the given equation:

$$(x - 4)^2 + (y + 1)^2 = 36$$

$$\text{Center: } (4, -1)$$

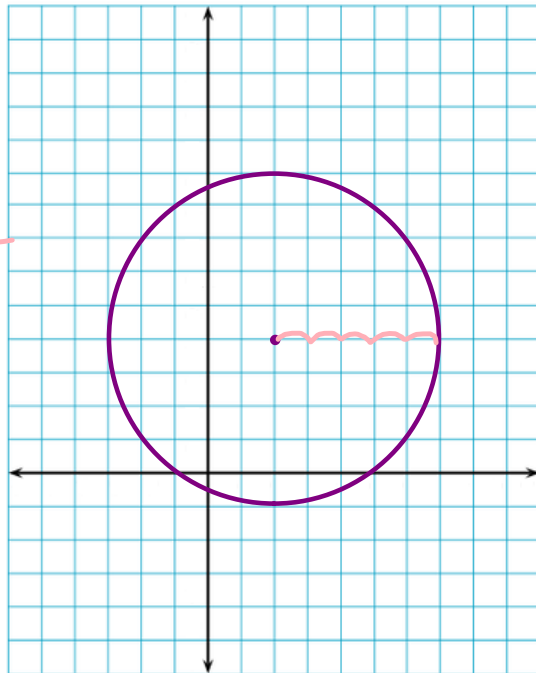
$$r = 6$$



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Find the equation of the circle with the given graph:

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



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Homework

Pages 801 - 802

9 - 27 by 3, 31 - 49 odd

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