# NPS Learning in Place

# Geometry
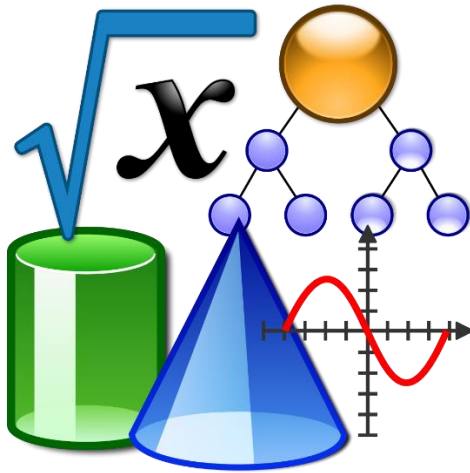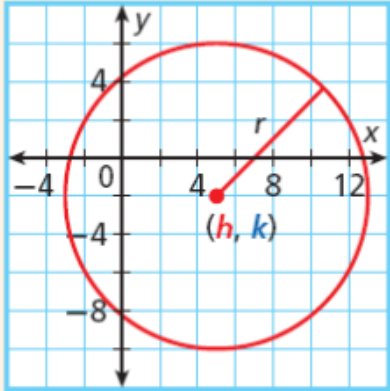
| Week 1 April 6-10 | **Equation of circles** **Day 1 - 5** |
|---|---|
| **Week 2** **April 20-24** | **Circles Continue** **Day 6 - 10** |

Name _____School _____Teacher_____

# STANDARD FORM OF THE EQUATION OF A CIRCLE

| EQUATION | EXAMPLE | GRAPH |
|---|---|---|
| The equation of a circle with center $(h, k)$ and radius $r$ is $$(x - h)^2 + (y - k)^2 = r^2.$$ | The equation of the circle with center $(5, -2)$ and radius $r = 8$ is $$(x - 5)^2 + \left(y - (-2)\right)^2 = 8^2$$ or $$(x - 5)^2 + (y + 2)^2 = 64.$$ |  |

## Helpful Hint

If the center of the circle is at the origin, the equation simplifies to $x^2 + y^2 = r^2$.

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**Example 1: Write the equation of a circle with center (–3, 4) and radius r = 6.**

Center: (h,k) →(-3, 4)    radius: r →6        $r^2$ = (6)(6) = 36

Formula: $(x - h)^2 + (y - k)^2 = r^2$
$(x - (-3))^2 + (y - 4)^2 = 6^2$
$(x + 3)^2 + (y - 4)^2 = 36$

**Example 2: Write the equation of the circle with center (0,6) and a diameter of 2.**

Center: (h,k) →(0, 6)
d = 2   radius: r →$\frac{d}{2}$ = 1   $r^2$ = (1)(1) = 1

Formula: $(x - h)^2 + (y - k)^2 = r^2$
$(x - 0)^2 + (y - 6)^2 = 1^2$
$x^2 + (y - 4)^2 = 1$

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**Example 3: Write the equation of a circle with center (-2,-5) and radius r = $\sqrt{12}$**

Center: (h,k) →(-2, -5)    radius: r → $\sqrt{12}$        $r^2 = (\sqrt{12})^2$ = 12

Formula: $(x - h)^2 + (y - k)^2 = r^2$
$(x - (-2))^2 + (y - (-5))^2 = (\sqrt{12})^2$
$(x + 2)^2 + (y + 5)^2 = 12$

# Equation of Circles Day 1

| Directions: Write the equation of the circle |
|---|

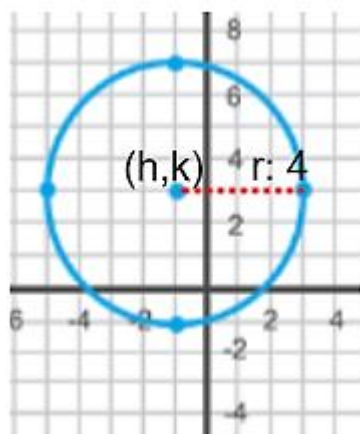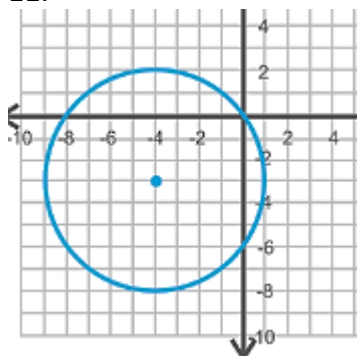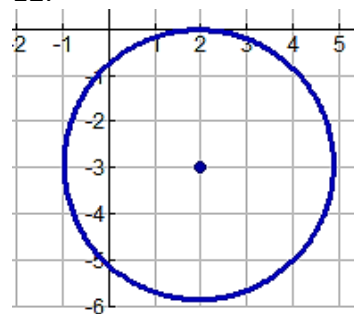| 1. radius: 2  center: (4, 6). | 2. radius: 8 center: (0, 9) | 3. radius: 3  center: (6, - 2). |
|---|---|---|
| 4. diameter: 10  center:  (-4, 0). | 5. diameter: 18 center: (-2, -5) | 6. diameter: 24  center: (-3, -1). |
| 7 diameter: 15  center: (0,0) | 8. radius $\sqrt{47}$ Center: (0, -5) | 9. radius: $\sqrt{15}$ Center: (0, -5) |
| 10. radius: 4   Center: (-1,3)<br> | 11.<br> | 12.<br> |

# Equation of a Circle given the center and a point on the circle-Day 2
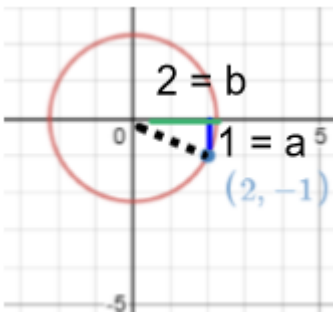
## Notes

**Write the equation of a circle given the center and a point on the circle.**
**Step 1:** Find the radius using the distance formula **or** the Pythagorean Theorem
**Step 2:** Substitute the center and the radius into the formula

**Example: Write the standard form of the equation of the circle that passes through the point (2, -1) and whose center is on the origin (0,0).**

| Distance formula | Pythagorean Theorem-Graph | Pythagorean Theorem- Table |
|---|---|---|
| $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ <br><br> d = distance (radius) <br> ($x_1$, $y_1$) = coordinates of the first point <br> ($x_2$,$y_2$) = coordinates of the second point) <br><br> **Points: (0,0) and (2,-1)** <br> $r = \sqrt{(2-0)^2 + (-1-0)^2}$ <br><br> $r = \sqrt{(2)^2 + (-1)^2}$ <br><br> $r = \sqrt{4+1}$ <br><br> $r = \sqrt{5}$    $r^2 = (\sqrt{5})^2 = 5$ | 2 = b <br> 0  1 = a  5 <br> (2, −1) <br><br> −5 <br><br> **a² + b² = c²** <br> **c = radius   c² = r²** <br> **(1)² + (2)² = r²** <br> **1 + 4 = r²** <br> **5 = r²** | **Points: (0,0) and (2,-1)** <br><br> | x | y | <br> 2−0 | 0 | 0 | −1−0 <br> 2 = a | 2 | -1 | −1 = b <br><br> **a² + b² = c²** <br> **c = radius   c² = r²** <br><br> **(2)² + (-1)² = r²** <br> **4 + 1 = r²** <br> **5 = r²** |

**Step 2: Write the equation of the circle**
**Center: (h,k) → (0,0)**          $r^2 = 5$

**Formula: (x – h)² + (y – k)² = r²**
         (x – 0)² + (y – 0)² = 5

$\boxed{x^2 + y^2 = 5}$

**You Try: Write the standard form of the equation of the circle that passes through the point (-5, 6) and whose center is on the origin (-1,3).**

# Equation of a Circle given the center and a point on the circle-Day 2

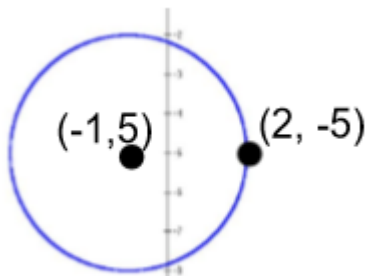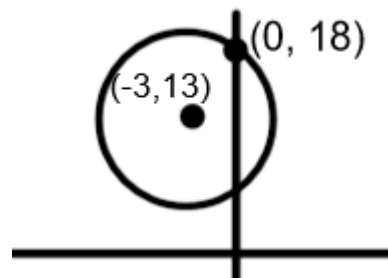| | |
|---|---|
| 1. Center: (9, 10), Point on Circle: (7, 4) | 2. Center: (1, -5), Point on Circle: (-7, -13) |
| 3. Center: (2, -6); Point on Circle: (1, 10) | 4. Center: (-2, 0); Point on Circle: (-9, -4) |
| 5. Center: (−13, −16); Point on Circle: (−10, −16) | 6. Center: (3, -4); Point on Circle (6, 2). |
| 7. Center: (5, 1); Point on the circle (8, -2). | 8. Center: origin; Point on Circle (4, 3). |
| 9.  (-1,5)  (2, -5) | 10.  (0, 18) (-3,13) |

# Equation of a Circle given the endpoints of the diameter-Day 3

## Notes

**Write the equation of a circle given the center and a point on the circle.**

**Step 1:** Find the center using the midpoint

**Step 2:** Find the radius using the coordinates of the center and a point on the circle

**Step 3:** Substitute the center and the radius into the formula

**Example: Write the standard form of the equation of the circle with a diameter with endpoints (-2, 1) and (4, 3).**

| Step 1: Midpoint | Step 2: Pythagorean Theorem- | Step 3: Substitute into the equation of a circle |
|---|---|---|
| Midpoint: Center of circle<br><br>Midpoint: $(\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2})$<br><br>**Points: (-2,1) and (4,3)**<br><br>Center: $(\frac{4+(-2)}{2}, \frac{3+1}{2})$<br><br>Center: $(\frac{2}{2}, \frac{4}{2})$<br><br>Center: ( 1, 2) | **Hint: Must use the center**<br><br>$\begin{array}{c|c} X & Y \\ \hline 1 & 2 \\ \hline 4 & 3 \end{array}$<br>$4 - 1$    $3 - 2$<br>$3 = a$    $1 = b$<br><br>**$a^2 + b^2 = c^2$**<br>**$c = radius$   $c^2 = r^2$**<br>**$(3)^2 + (1)^2 = r^2$**<br>**$9 + 1 = r^2$**<br>**$10 = r^2$** | **Write the equation of the circle**<br><br>**Center: (h,k) → (1,2)**<br><br>**$r^2 = 5$**<br><br>**Formula: $(x - h)^2 + (y - k)^2 = r^2$**<br><br>$\boxed{(x - 1)^2 + (y - 2)^2 = 10}$ |

**You Try it: Write the standard form of the equation of the circle with a diameter with endpoints (8, -7) and (4, 5).**

| Step 1: Midpoint | Step 2: Pythagorean theorem | Step 3: Substitute into the equation of a circle |
|---|---|---|
|  |  |  |

# Equation of a Circle given the endpoints of the diameter-Day 3

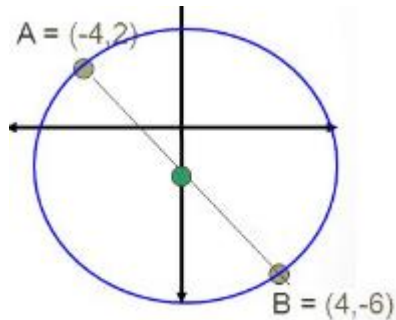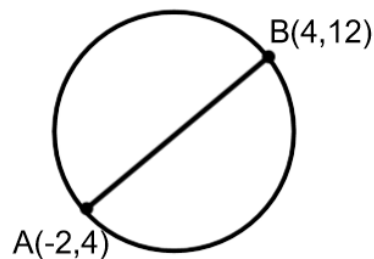| **Directions: Write the equation of a circle given the endpoints of the diameter** | |
|---|---|
| 1. Write the equation of a circle with diameter endpoints of (13, -1) and (-15, 9) | 2. Write the equation of a circle with diameter endpoints of (-5, 2) and (3, 6) |
| 3. Write the equation of a circle with diameter endpoints of (5, 4) and (-1, -6) | 4. Write the equation of a circle with diameter endpoints of (-2, 1) and (8, 9) |
| 5. Write the equation of a circle with diameter endpoints of (-6, 7) and (4, 1) | 6. Write the equation of a circle with diameter endpoints of (2, 8) and (2, -2) |
| 7. Write the equation of a circle with diameter endpoints of (10, -6) and (-6, 10) | 8. Write the equation of a circle with diameter endpoints of (1, 2) and (-1, -6) |
| 9.  A = (-4, 2)  B = (4, -6) | 10.  B(4, 12)  A(-2, 4) |

## Notes

**Classifying Points**

**Step 1: Determine the equation of the circle. (it may be given)**

**Step 2: Plug in the coordinates of interest.**

Classification Rules

If $(x - h)^2 + (y - k)^2 = r^2$ then the point is **ON** the circle.

If $(x - h)^2 + (y - k)^2 < r^2$ then the point is **INSIDE** the circle.

If $(x - h)^2 + (y - k)^2 > r^2$ then the point is **OUTSIDE** the circle.

**Example 1:**

Given the equation of the circle, determine if the point is on, inside, or outside the circle.

$(x + 3)^2 + y^2 = 256$     point (5, 3)         **On**     **Inside**     **Outside**

$(5 + 3)^2 + 3^2 =? 256$
$8^2 + 3^2 =? 256$
$64 + 9 =? 256$
$73 < 256$

**You Try! Example 2:**

Given the equation of the circle, determine if the point is on, inside, or outside the circle.

$(x + 6)^2 + (y - 8)^2 = 4$   point (14 ,9)         **On**     **Inside**     **Outside**

**You Try! Example 3:**

Given the equation of the circle, determine if the point is on, inside, or outside the circle.

$(x - 2)^2 + (y + 3)^2 = 9$     point (2, 0)         **On**     **Inside**     **Outside**

# Determine if a point is on the circle-Day 4

| | | |
|---|---|---|
| **1.** $x^2 + (y - 4)^2 = 49$ point (0, 11) | | |
| on | inside | outside |

| | | |
|---|---|---|
| **2.** $(x + 6)^2 + (y + 3)^2 = 25$ point (-2, 1) | | |
| on | inside | outside |

| | | |
|---|---|---|
| **3.** $(x - 7)^2 + (y - 1)^2 = 16$ point (12,6) | | |
| on | inside | outside |

| | | |
|---|---|---|
| **4.** $(x - 5)^2 + (y - 1)^2 = 9$ point (6, 0) | | |
| on | inside | outside |

| | | |
|---|---|---|
| **5.** $(x - 5)^2 + (y - 1)^2 = 9$ point (8, 2) | | |
| on | inside | outside |

| | | |
|---|---|---|
| **6.** $(x - 2)^2 + (y + 3)^2 = 4$ Point (3, -1) | | |
| on | inside | outside |

**7.** The center of a circle is (-3, 0) and its radius is 5. Which point does NOT line on the circle?

A. (2, 0)
B. (0, 4)
C. (-3, 0)
D. (-3, -5)

**8.** Circle O has a center at (3, 1) and a diameter of 10 units. Which point lies on circle O?

A. (3, 4)
B. (-3, -1)
C. (5, 1)
D. (8, 0)

**9. Which of these points lie on the circle represented by this equation?**
$(x - 4)^2 + (y + 3)^2 = 10^2$

| | | |
|---|---|---|
| $(-4, 3)$ | $(-6, 3)$ | $(4, 7)$ |
| $(4, -3)$ | | $(10, 5)$ |

**10. A circle has a center at (-1, 4) and a diameter of 20. Select each pair of coordinates that represent a point on this circle.**

| | | |
|---|---|---|
| (-7, -4) | (11, 20) | (19, 16) |
| (5, 12) | (-9, -2) | (-1, 4) |

# Determine parts of a circle given the Equation-Day 5

## Notes

## Formula: $(x \ominus h)^2 + (y \ominus k)^2 = r^2$

**HINT: Notice the operation inse the parentheis is subtraction. If the operation is not subtraction, you must rewrite the equation using subtraction**

**Step 1: Is the operation inside parenthesis Subtraction**

| YES! | NO! |
|---|---|
| The center is represented by the number following the subtraction. | Rewrite the equation using subtraction. |

**Step 2: Take the square root of $r^2$ to find the radius.**
**Step 3: Double the radius to find the diameter.**

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**Example 1:**  $(x-2)^2 + (y-3)^2 = 25$.   (a)  Find the center, radius and diameter

**Step 1:** Is the operation inside the parenthesis subtraction? Yes
Center: (2, 3)

**Step 2:** $r^2 = 25$
    $r = \sqrt{25}$
    $r = 5$              Diameter: (2)(5) = 10

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**Example 2:** $(x - 3)^2 + (y + 6)^2 = 81$    (a)  Find the center, radius and diameter

**Step 1:** Is the operation inside the parenthesis subtraction? **Yes** for the x, NO for the y. Rewrite the y as a subtraction.
$(x - 3)^2 + (y - (-6))^2 = 81$
Center: (3, -6)

**Step 2:** $r^2 = 81$
    $r = \sqrt{81}$
    $r = 9$              Diameter: (2)(9) = 18

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**Example 3:** $x^2 + (y - 3)^2 = 30$
        $(x - 0)^2 + (y - 3)^2 = 30$

**Step 1:** Is the operation inside the parenthesis subtraction? **Yes**
Center: (0, 3)

**Step 2:** $r^2 = 30$
    $r = \sqrt{30}$             Diameter: $(2)(\sqrt{30}) = 2\sqrt{30}$

# Determine parts of a circle given the Equation-Day 5

**Directions: Given the equation of the circle, determine the center, radius and diameter**

| | |
|---|---|
| 1. $(x - 9)^2 + (y - 4)^2 = 36$ <br><br> Center: <br><br> Radius: <br><br> Diameter: | 2. $(x + 1)^2 + (y - 1)^2 = 196$ <br><br> Center: <br><br> Radius: <br><br> Diameter: |
| 3. $(x + 6)^2 + y^2 = 90.25$ <br><br> Center: <br><br> Radius: <br><br> Diameter: | 4. $(x - 2)^2 + (y + 13)^2 = 150$ <br><br> Center: <br><br> Radius: <br><br> Diameter: |
| 5. $(x - 1)^2 + (y + 4)^2 = 169$ <br><br> Center: <br><br> Radius: <br><br> Diameter: | 6. $x^2 + y^2 = 16$ <br><br> Center: <br><br> Radius: <br><br> Diameter: |
| 7. The equation of a circle is $(x + 2)^2 + (y + 7)^2 = 49$. What is the center of the circle? <br><br> A. (2, 7) <br> B. (-2, 7) <br> C. (2, -7) <br> D. (-2, -7) | 8. The equation of a circle is $(x - 3)^2 + (y + 4)^2 = 16$ <br><br> a) What is the coordinate of the center of the circle? <br><br> b) What is the radius of the circle? <br><br> c) What is the diameter of the circle? |

9. Circle P is represented by this equation:
$$(x + 5)^2 + (y - 3)^2 = 40$$

What is the diameter of circle P?

A. $2\sqrt{10}$
B. $4\sqrt{10}$
C. 40
D. 80

10. Circle O is represented by this equation:
$$(x - 2)^2 + (y + 3)^2 = 63$$
Determine the center, radius and diameter

| Center | Radius | Diameter |
|---|---|---|
| | | |

| | | | |
|---|---|---|---|
| (2, 3) | (-2, 3) | (2, -3) | (-2, -3) |
| 31.5 | $6\sqrt{7}$ | 126 | $3\sqrt{7}$ |

## Notes

**Write the equation of a circle given the center and a point on the circle.**
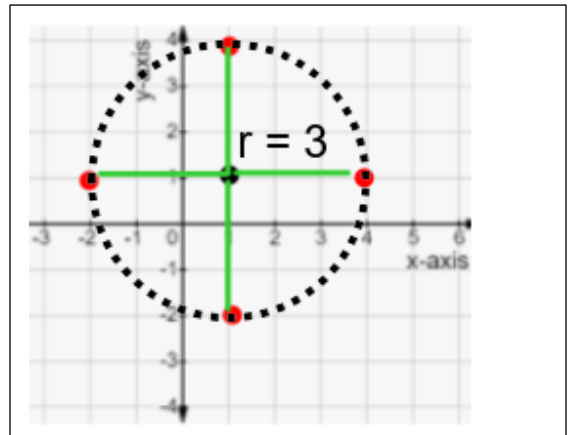
**Step 1:** Determine the center

**Step 2:** Determine the radius

**Step 3:** Use the radius to graph 4 points.

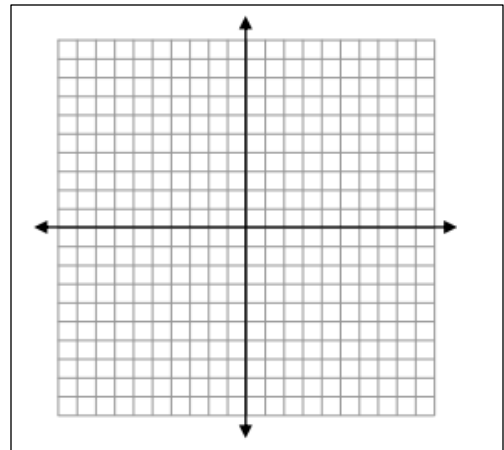**Example 1:** $(x - 1)^2 + (y - 1)^2 = 9$

Center: (1, 1)          $r^2 = 9$

$r = \sqrt{9}$

$r = 3$
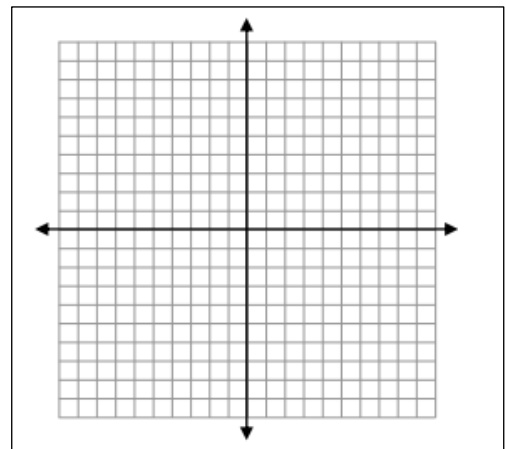


**You Try! Example 2:** $x^2 + y^2 = 36$

Center: (   ,   )

Radius: _____



**You Try! Example 3:** $(x - 3)^2 + (y - 4)^2 = 25$
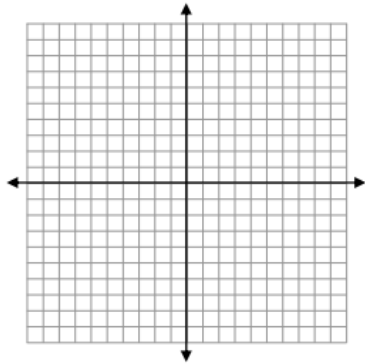
Center: (   ,   )

Radius: _____

# Graph the Circle given the Equation-Day 6

## Directions: Graph the circle give the equation

1. $x^2 + y^2 = 49$

Center:

Radius:

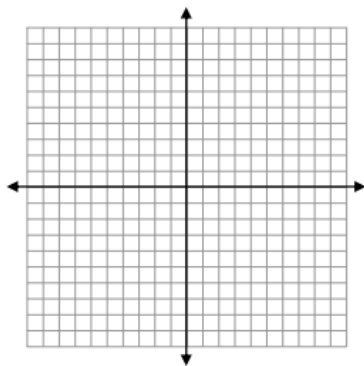2. $(x + 1)^2 + (y - 1)^2 = 4$

Center:
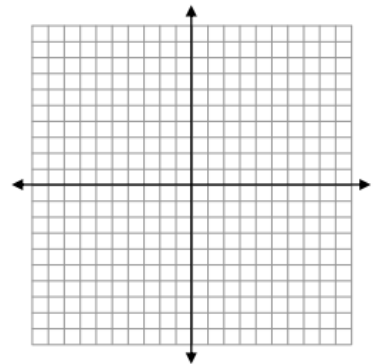
Radius:
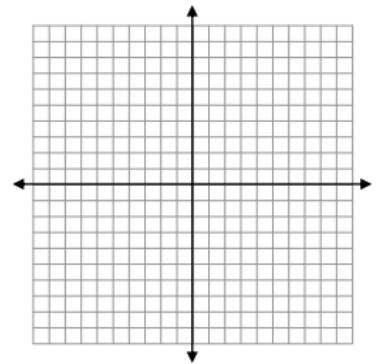
3. $(x - 4)^2 + (y - 3)^2 = 16$
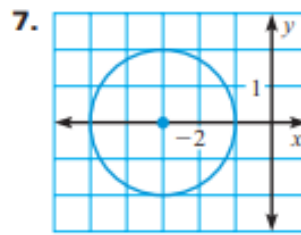
Center:

Radius:

4. $x^2 + y^2 = 16$

Center:

Radius:

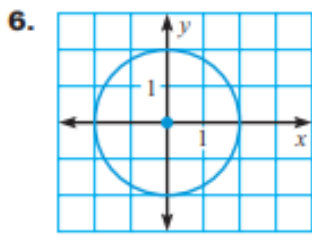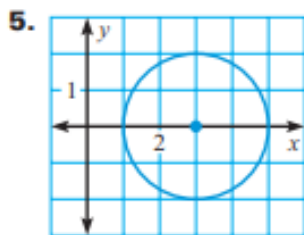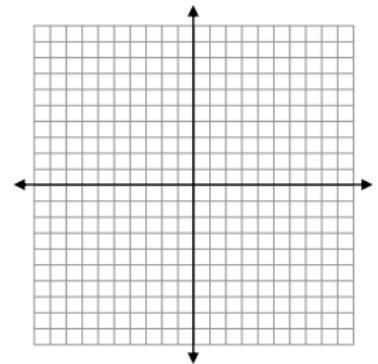**Matching Equations** Match each graph with its equation.

**A.** $x^2 + y^2 = 4$      **B.** $(x - 3)^2 + y^2 = 4$      **C.** $(x + 3)^2 + y^2 = 4$

5.

6.

7.

8. Circle O is representes by the equation $(x + 2)^2 + (y + 2)^2 = 100$. Which point lies on circle O?

A. (-6, -5)
B. (-2, -2)
C. (6, 4)
D. (8,8)

# Coordinate Plane Circle Day 7

Graph the following circles on the same coordinate plane, using graph paper and complete the table.

1. Circle $C_1$ has equation $(x - 3)^2 + (y - 4)^2 = 25$.
2. Circle $C_2$ has center $(0, 0)$ and radius 2.
3. Circle $C_3$ has center $(0, 0)$, and $(-3, 4)$ is one point on the circle.
4. Circle $C_4$ has center $(-3, 0)$, and $(-3, 2)$ is one point on the circle.
5. Circle $C_5$ has center $(3, 0)$ and is congruent to $c_3$.
6. $(1, 0)$ and $(-1, 0)$ are two points on a diameter of the circle $C_6$.
7. Reflect circle $C_6$ across the $x$-axis. The image is circle $C_7$.
8. Circle $C_8$ has the following graph.
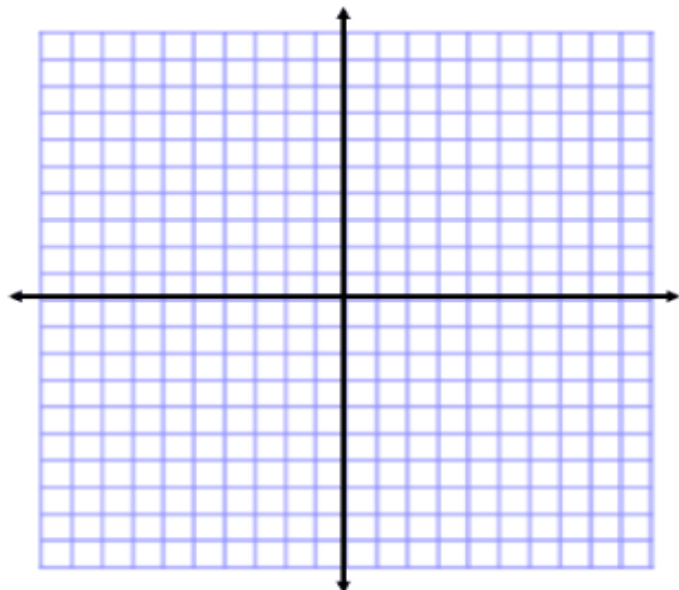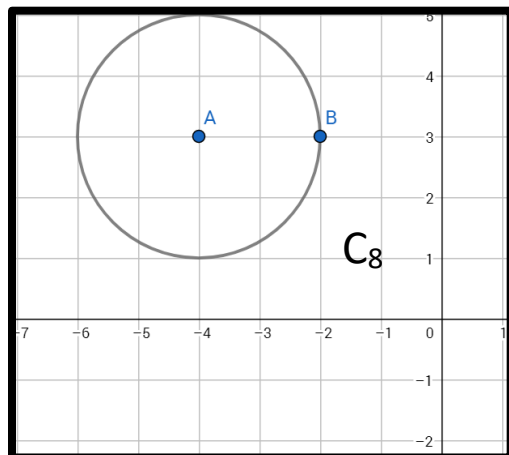
|  | center = $(h, k)$ | radius = $r$ | List four points on the circle. | Equation of the Circle |
|---|---|---|---|---|
| $C_1$ |  |  |  |  |
| $C_2$ |  |  |  |  |
| $C_3$ |  |  |  |  |
| $C_4$ |  |  |  |  |
| $C_5$ |  |  |  |  |
| $C_6$ |  |  |  |  |
| $C_7$ |  |  |  |  |
| $C_8$ |  |  |  |  |

# Circles in the Coordinate Plane Day 7

Graph the following equations. Then, answer the questions using the following vocabulary: center, diameter, radius, quadrant, x-axis, and y-axis.
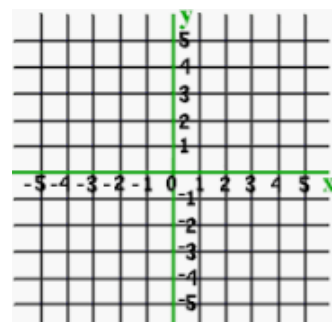
1. Graph the equations $x^2 + y^2 = 1$ and $x^2 + y^2 = 4$ on the same graph. What is the difference between the two graphs? How does this relate to the difference between the two equations? Be specific.
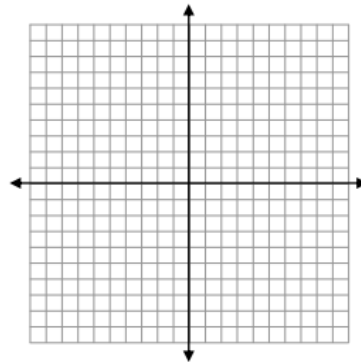
2. Graph the equations $x^2 + y^2 = 1$ and $(x - 2)^2 + y^2 = 1$ on the same graph. What is the difference between the two graphs? How does this relate to the difference between the two equations? Be specific.
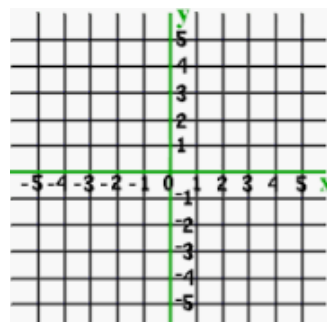
3. Graph the equations $x^2 + y^2 = 1$ and $x^2 + (y - 2)^2 = 1$ on the same graph. What is the difference between the two graphs? How does this relate to the difference between the two equations? Be specific.

4. Graph the equations $x^2 + y^2 = 1$ and $(x - 2)^2 + (y - 2)^2 = 1$ on the same graph. What is the difference between the two graphs? How does this relate to the difference between the two equations? Be specific.
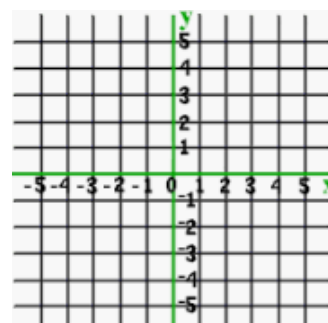
# Day 8: Practice

**1.**

A circle has the equation $x^2 + y^2 = 16$.
What is the radius of the circle?

A.  4

B. 16

C. 32

D. 256

**2.**

A circle has the equation
$(x + 5)^2 + (y - 2)^2 = 9$. What is the
center of the circle?

F. $(5, -2)$

G. $(-5, 2)$

H. $(2, -5)$

I.  $(-2, 5)$

**3.**

A circle has the equation
$(x - 3)^2 + (y + 5)^2 = 36$. Which of the
following statements is NOT true?

A. The x-coordinate of the center is 3.

B. The y-coordinate of the center is 5.

C. The radius of the circle is 6.
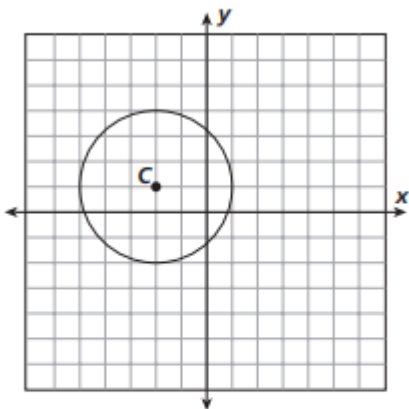
D. The point (3, 1) lies on the circle.

**4.**

What is the equation of a circle with
center (2, 4) and radius 5?

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

G. $(x + 2)^2 + (y + 4)^2 = 5$

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

I.  $(x + 2)^2 + (y + 4)^2 = 25$
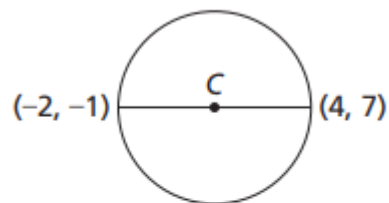
**5.**

. C is the center of the circle shown
below.



What is the equation of circle C?

A. $(x - 2)^2 + (y + 1)^2 = 3$

B. $(x + 2)^2 + (y - 1)^2 = 3$

C. $(x - 2)^2 + (y + 1)^2 = 9$

D. $(x + 2)^2 + (y - 1)^2 = 9$

**6.**

C is the center of the circle shown
below.



What is the equation of circle C?

A. $(x - 1)^2 + (y - 3)^2 = 100$

B. $(x + 1)^2 + (y + 3)^2 = 100$

C. $(x - 1)^2 + (y - 3)^2 = 25$

D. $(x + 1)^2 + (y + 3)^2 = 25$

# Day 8: Practice

**7.**

Which point lies on the circle whose equation is $(x - 3)^2 + (y + 3)^2 = 45$?

**F.** (0, 3)

**G.** (1, 3)

**H.** (2, 3)

**I.** (3, 3)

**8.**

The center of a circle is at $(-5, 0)$, and the diameter of the circle is 18. Which of the following is the equation of the circle?

**A.** $(x - 5)^2 + y^2 = 9$

**B.** $(x - 5)^2 + y^2 = 81$

**C.** $(x + 5)^2 + y^2 = 9$

**D.** $(x + 5)^2 + y^2 = 81$

**9.**

The center of a circle is at $(6, -7)$ and the diameter of the circle is 22. Which of the following is the equation of the circle?

**F.** $(x - 6)^2 + (y + 7)^2 = 11$

**G.** $(x + 6)^2 + (y - 7)^2 = 11$

**H.** $(x + 6)^2 + (y - 7)^2 = 121$

**I.** $(x - 6)^2 + (y + 7)^2 = 121$

**10.**

Which is the equation of a circle whose center is at the origin and that passes through the point (3, 5)?

**F.** $(x - 3)^2 + (y - 5)^2 = 34$

**G.** $(x - 3)^2 + (y - 5)^2 = 64$

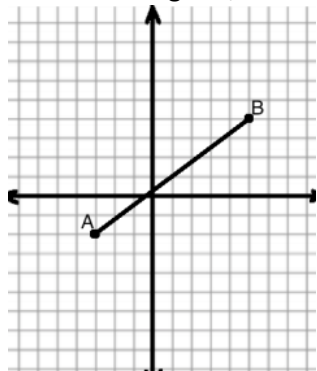**H.** $x^2 + y^2 = 34$

**I.** $x^2 + y^2 = 64$

**11.**

Choose the expressions from the table below to correctly represent the equation of the given circle:

A circle whose center is at (2, -5) and whose radius is 9

| | | |
|---|---|---|
| $(x-2)^2$ | $(x+2)^2$ | $x^2$ |
| $(y-5)^2$ | $(y+5)^2$ | $y^2$ |
| 3 | 81 | 9 |

☐ + ☐ = ☐

**12.** In the diagram, $\overline{AB}$ is a diameter. Identify the center and the radius.



Center: ( ☐ , ☐ )

Radius: ☐

# Day 9: Circles Practice

**1.**

The endpoints of a diameter of a circle are (–4, 4) and (2, 4). What is an equation of the circle?

A $(x + 1)^2 + (y - 4)^2 = 9$

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

C $(x - 1)^2 + (y + 4)^2 = 9$

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

**2.Given: Circle O with a diameter $\overline{CD}$**

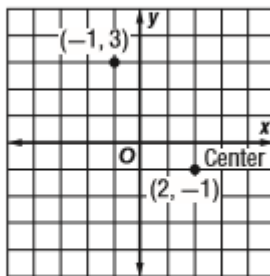C (-7, -4)  and D (1, 2)

Create the equation of this circle.

**The Equation of the Circle**

☐ + ☐ = ☐

| $(x - 3)^2$ | $(x + 3)^2$ | $(y - 1)^2$ | $(y + 1)^2$ | 25 | 100 |

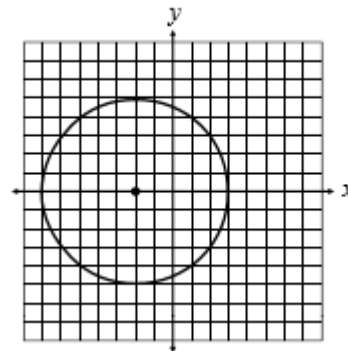**3.**

The center and a point on a circle are shown. What is an equation of the circle?



A $(x - 2)^2 + (y + 1)^2 = 9$

B $(x + 1)^2 + (y - 3)^2 = 25$

C $(x - 2)^2 + (y + 1)^2 = 25$

D $(x + 2)^2 + (y - 1)^2 = 25$

**4. Write the equation of the circled graph below.**



**5.**

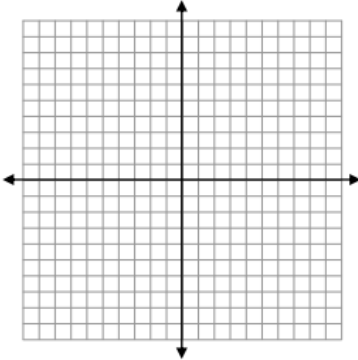A circle with center (3, –4) contains the point (6, 0). What is an equation of the circle?

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

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

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

D $(x - 9)^2 + (y + 4)^2 = 25$

**6.**

A circle with center (4, –1) contains the point (7, 3). What is an equation of the circle?

F $(x - 4)^2 + (y + 1)^2 = 100$

G $(x - 4)^2 + (y + 1)^2 = 5$

H $(x - 4)^2 + (y + 1)^2 = 25$

J $(x + 4)^2 + (y - 1)^2 = 25$

# Day 9: Circles Practice

| 7. | 8. |
|---|---|
| A circle with center (5, –3) has a radius of 4 units. Which point is on the circle?<br><br>A (13, –3)<br>B (9, 1)<br>C (1, –7)<br>D (5, 1) | The endpoints of the diameter of a circle are (–3, 8) and (–5, 4). What is an equation of the circle?<br><br>A $(x + 4)^2 + (y - 6)^2 = 20$<br>B $(x - 4)^2 + (y + 6)^2 = 25$<br>C $(x + 4)^2 + (y - 6)^2 = 100$<br>D $(x + 4)^2 + (y - 6)^2 = 5$ |
| 9. | 10. Identify the center, radius and diameter of a circle with the equation |
| Circle A has equation<br>$(x - 5)^2 + (y + 1)^2 = 16$. What is the center and radius of the circle? | $$(x - 1)^2 + (y + 4)^2 = 81$$ |
| 11. Given point on a circle at (1, -7) and a center at (-6, -4), write the equation of the circle. | 12. Circle O is defined by the equation<br>$$x^2 + (y - 2)^2 = 25$$<br>Plot the center of circle O and one point with integral coordinates that lies on the circle.<br><br> |
| 13.<br>Give the equation of the circle<br>$(x + 5)^2 + (y - 1)^2 = 16$, which correctly gives the center and radius of the circle?<br><br>A. (5, -1); $r = 4$     C. (5, -1); $r = 8$<br>B. (-5, 1); $r = 4$     D. (-5, 1); $r = 8$ | 14.<br>A circle with a center at (2, -3) passes through the point (-1, -8). Write the equation of the circle.<br><br>A. $(x - 2)^2 + (y + 3)^2 = 34$<br>B. $(x + 2)^2 + (y - 3)^2 = 34$<br>C. $(x - 2)^2 + (y + 3)^2 = 17$<br>D. $(x + 2)^2 + (y - 3)^2 = 17$ |

# Day 10

**On your graph paper, you must create a picture using circles. You must use at least 4 circles in your picture. You must also provide the equations of each circle, the center and the radius.**
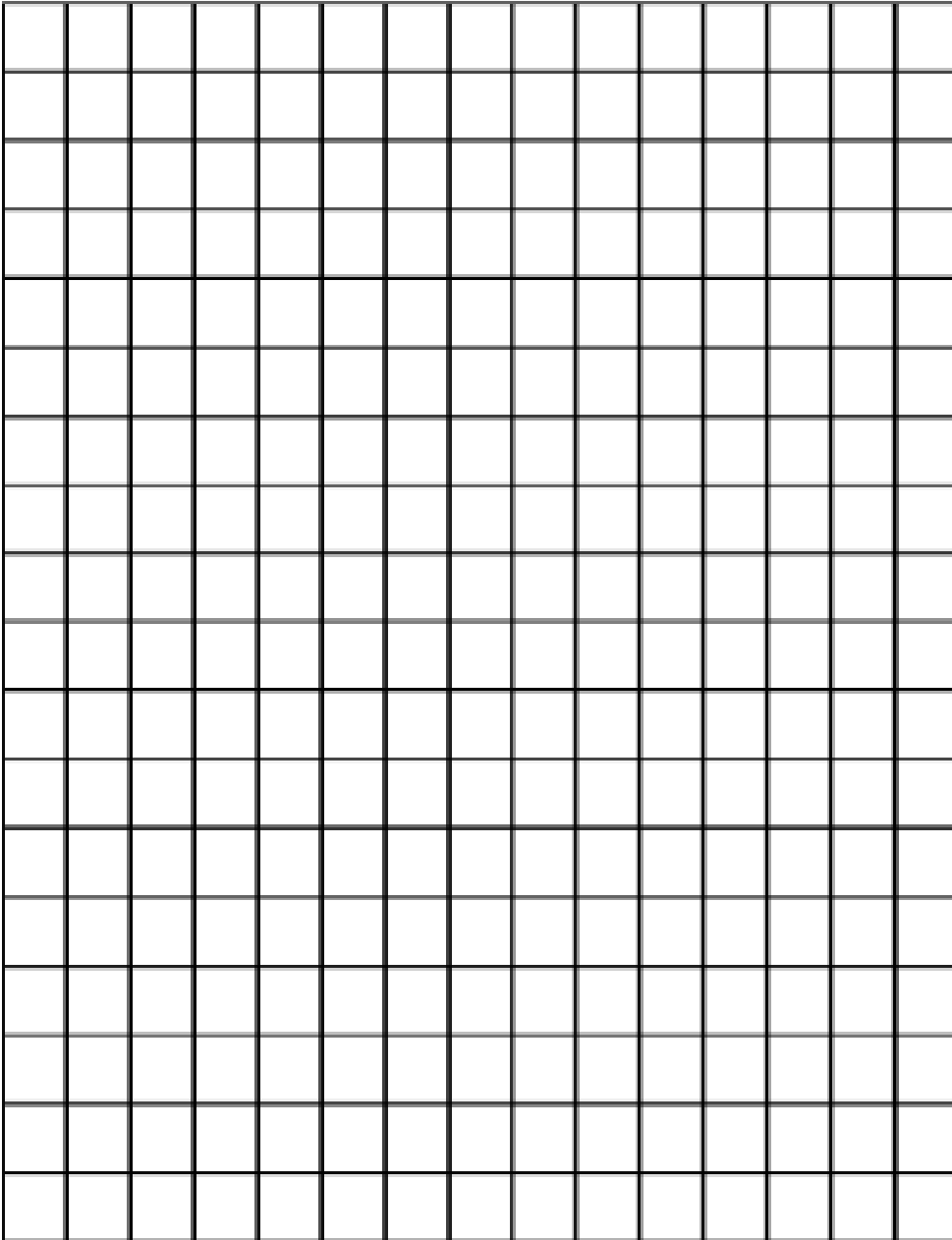
| Equations, center, radius |
|---|
| 1. |
| 2. |
| 3. |
| 4. |

**Journal/Writing Prompt:** Explain how you would find the equation of a circle whose graph is given.