

Practice

Equations of Circles

Find the coordinates of the center and the measure of the radius for each circle whose equation is given.

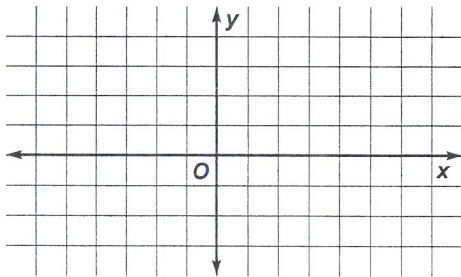
1. $(x - 3)^2 + (y + 1)^2 = 16$

2. $(x + \frac{5}{8})^2 + (y + 2)^2 = \frac{25}{9}$

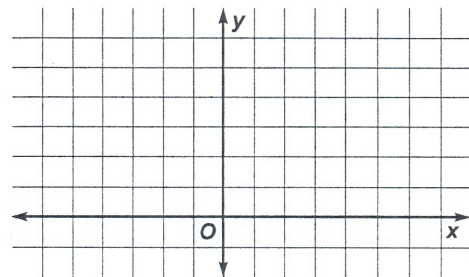
3. $(x - 3.2)^2 + (y - 0.75)^2 = 40$

Graph each equation on a coordinate grid.

4. $(x - 2)^2 + y^2 = 6.25$



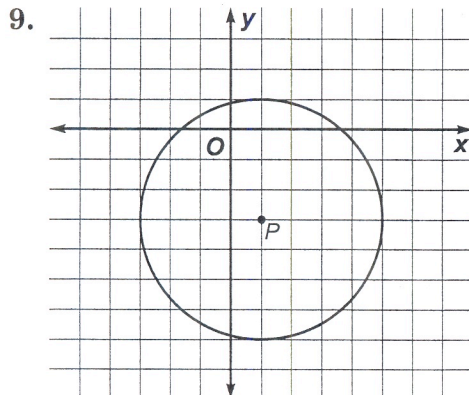
5. $(x + 3)^2 + (y - \frac{3}{2})^2 = 4$



Write the equation of circle *P* based on the given information.

7. center: $P(0, \frac{1}{2})$
 radius: 8

8. center: $P(-5.3, 1)$
 diameter: 9



10. a diameter whose endpoints are at $(5, -7)$ and $(-2, 4)$

10-8 Practice

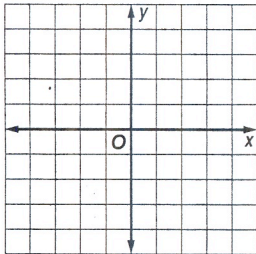
Equations of Circles

Write an equation for each circle.

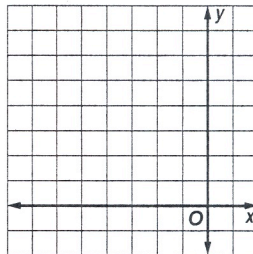
- center at origin, $r = 7$
- center at $(0, 0)$, $d = 18$
- center at $(-7, 11)$, $r = 8$
- center at $(12, -9)$, $d = 22$
- center at $(-6, -4)$, $r = \sqrt{5}$
- center at $(3, 0)$, $d = 28$
- a circle with center at $(-5, 3)$ and a radius with endpoint $(2, 3)$
- a circle whose diameter has endpoints $(4, 6)$ and $(-2, 6)$

Graph each equation.

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



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



11. **EARTHQUAKES** When an earthquake strikes, it releases seismic waves that travel in concentric circles from the epicenter of the earthquake. Seismograph stations monitor seismic activity and record the intensity and duration of earthquakes. Suppose a station determines that the epicenter of an earthquake is located about 50 kilometers from the station. If the station is located at the origin, write an equation for the circle that represents a possible epicenter of the earthquake.

Reteaching 11-5

Circles in the Coordinate Plane

OBJECTIVE: Writing the equation of a circle

MATERIALS: None

Example

Find the equation of the circle whose center is $(-5, 2)$ and that passes through $(3, 3)$.

Use the center and point to find the radius.

$$r = \sqrt{(-5 - 3)^2 + (2 - 3)^2} \quad \text{Distance Formula}$$

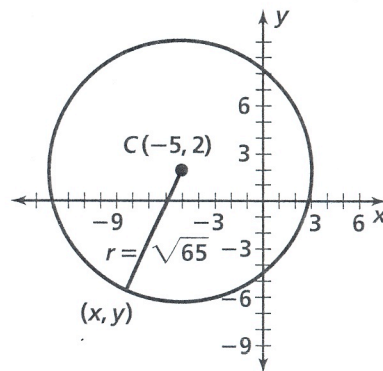
$$r = \sqrt{(-8)^2 + (-1)^2}$$

$$r = \sqrt{65}$$

With $r = \sqrt{65}$ and center at $(-5, 2)$, the circle has the equation

$$(x - (-5))^2 + (y - 2)^2 = (\sqrt{65})^2.$$

Simplified, this becomes $(x + 5)^2 + (y - 2)^2 = 65$.



Exercises

Find the equation of the circle whose center and radius are given.

1. center $(3, 11)$
radius = 2

2. center $(-5, 0)$
radius = 15

3. center $(6, -6)$
radius = $\sqrt{7}$

Find the equation of the circle that passes through the point $(-2, -4)$ with the given center.

4. $C(0, 0)$

5. $C(-2, -2)$

6. $C(3, 1)$

Find the equation of each circle described.

7. The circle has center $(5, 2)$ and diameter 12.

8. The endpoints of the circle's diameter are the points $(4, -3)$ and $(4, 7)$.

9. The endpoints of the circle's diameter are the points $(2, 6)$ and $(-6, 0)$.

Identify the center and radius of each circle.

10. $(x + 3)^2 + (y + 5)^2 = 25$

11. $x^2 + y^2 = 0.04$

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

13. $\frac{(x - 3)^2}{2} + \frac{(y - 5)^2}{2} = 8$

Practice 11-5

Circles in the Coordinate Plane

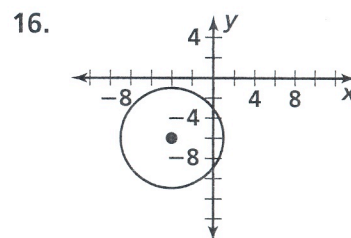
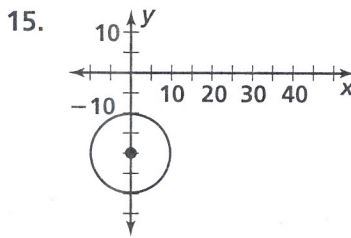
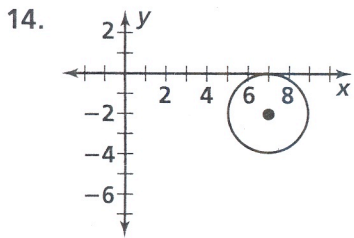
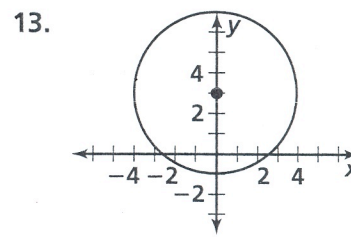
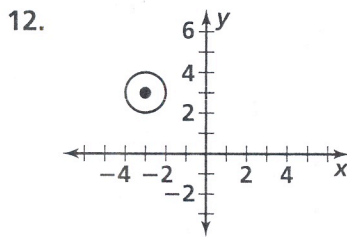
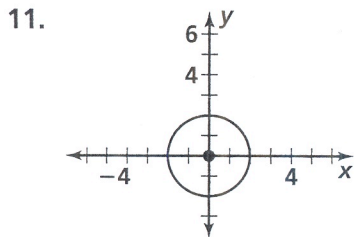
Find the center and radius of each circle.

1. $x^2 + y^2 = 36$
2. $(x - 2)^2 + (y - 7)^2 = 49$
3. $(x + 1)^2 + (y + 6)^2 = 16$
4. $(x + 3)^2 + (y - 11)^2 = 12$

Write the standard equation of each circle.

5. center $(0, 0)$; $r = 7$
6. center $(4, 3)$; $r = 8$
7. center $(5, 3)$; $r = 2$
8. center $(-5, 4)$; $r = \frac{1}{2}$
9. center $(-2, -5)$; $r = \sqrt{2}$
10. center $(-1, 6)$; $r = \sqrt{5}$

Write an equation for each circle.



Graph each circle. Label its center, and state its radius.

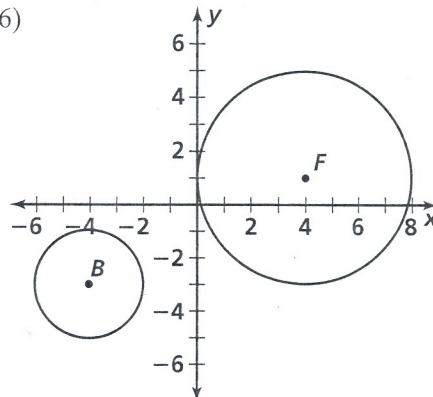
17. $x^2 + y^2 = 25$
18. $(x - 3)^2 + (y - 5)^2 = 9$
19. $(x + 2)^2 + (y + 4)^2 = 16$
20. $(x + 1)^2 + (y - 1)^2 = 36$

Write an equation for each circle with the given center that passes through the given point.

21. center $(0, 0)$; point $(3, 4)$
22. center $(5, 9)$; point $(2, 9)$
23. center $(-4, -3)$; point $(2, 2)$
24. center $(7, -2)$; point $(-1, -6)$

Write an equation that describes the position and range of each circle.

25. $\odot B$
26. $\odot F$



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