

**10-8 Lesson Reading Guide*****Equations of Circles*****Get Ready for the Lesson**

Read the introduction to Lesson 10-8 in your textbook.

In a series of concentric circles, what is the same about all the circles, and what is different?

*Skip***Read the Lesson**

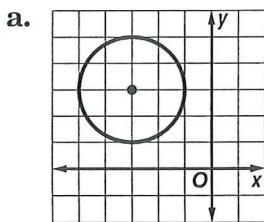
1. Identify the center and radius of each circle.

- a.  $(x - 2)^2 + (y - 3)^2 = 16$  (2, 3)  $r=4$       b.  $(x + 1)^2 + (y + 5)^2 = 9$  (-1, -5)  $r=3$   
 c.  $x^2 + y^2 = 49$  (0, 0)  $r=7$       d.  $(x - 8)^2 + (y + 1)^2 = 36$  (8, -1)  $r=6$   
 e.  $x^2 + (y - 10)^2 = 144$  (0, 10)  $r=12$       f.  $(x + 3)^2 + y^2 = 5$  (-3, 0)  $r=\sqrt{5}$

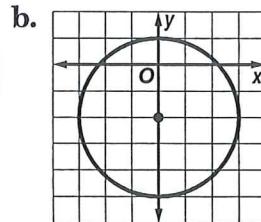
2. Write an equation for each circle.

- a. center at origin,  $r = 8$   $x^2 + y^2 = 64$   
 b. center at (3, 9),  $r = 1$   $(x - 3)^2 + (y - 9)^2 = 1$   
 c. center at (-5, -6),  $r = 10$   $(x + 5)^2 + (y + 6)^2 = 100$   
 d. center at (0, -7),  $r = 7$   $x^2 + (y + 7)^2 = 49$   
 e. center at (12, 0),  $d = 12$   $(x - 12)^2 + y^2 = 36$   
 f. center at (-4, 8),  $d = 22$   $(x + 4)^2 + (y - 8)^2 = 121$   
 g. center at (4.5, -3.5),  $r = 1.5$   $(x - 4.5)^2 + (y + 3.5)^2 = 2.25$   
 h. center at (0, 0),  $r = \sqrt{13}$   $x^2 + y^2 = 13$

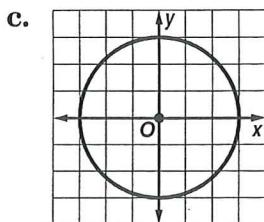
3. Write an equation for each circle.



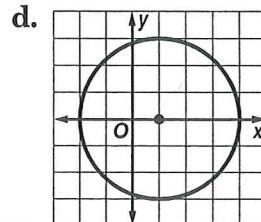
$$(x + 3)^2 + (y - 3)^2 = 4$$



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



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



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

**Remember What You Learned**

4. A good way to remember a new mathematical formula or equation is to relate it to one you already know. How can you use the Distance Formula to help you remember the standard equation of a circle?

## 10-8 Study Guide and Intervention

(continued)

### Equations of Circles

**Graph Circles** If you are given an equation of a circle, you can find information to help you graph the circle.

**Example** Graph  $(x + 3)^2 + (y - 1)^2 = 9$ .

Use the parts of the equation to find  $(h, k)$  and  $r$ .

$$\begin{aligned} (x - h)^2 + (y - k)^2 &= r^2 \\ (x - h)^2 + (y - k)^2 &= (y - 1)^2 \\ (x - h)^2 &= (y - 1)^2 \\ x - h &= y - 1 \\ -h &= -1 \\ h &= 3 \end{aligned}$$

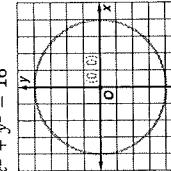
The center is at  $(-3, 1)$  and the radius is 3. Graph the center.

Use a compass set at a radius of 3 grid squares to draw the circle.

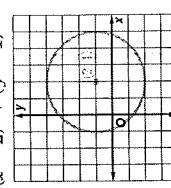
**Exercises**

Graph each equation.

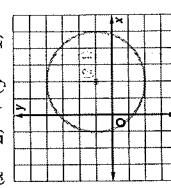
$$1. x^2 + y^2 = 16$$



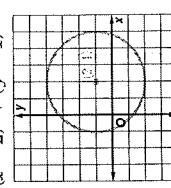
$$2. (x - 2)^2 + (y - 1)^2 = 9$$



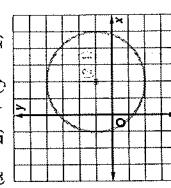
$$3. (x + 2)^2 + y^2 = 16$$



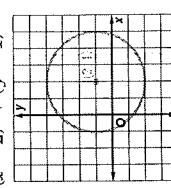
$$4. x + 1)^2 + (y - 2)^2 = 6.25$$



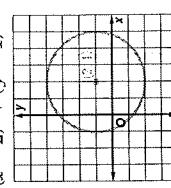
$$5. (x + \frac{1}{2})^2 + (y - \frac{1}{4})^2 = 4$$



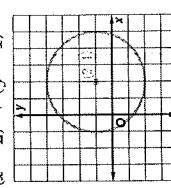
$$6. x^2 + (y - 1)^2 = 9$$



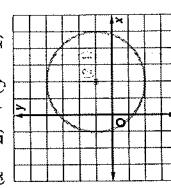
$$7. (x - 1)^2 + (y - 4)^2 = 9$$



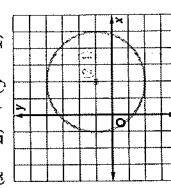
$$8. (x + 2)^2 + (y + 7)^2 = 200$$



$$9. (x + 3)^2 + (y - 9)^2 = 16$$



$$10. (x - 1)^2 + (y - 7)^2 = 9$$



Graph each equation.

$$11. x^2 + y^2 = 16$$



$$12. (x - 1)^2 + (y - 4)^2 = 9$$



## 10-8 Skills Practice

### Equations of Circles

Write an equation for each circle.

$$1. \text{center at } (0, 0), r = 6$$

$$x^2 + y^2 = 36$$

$$2. \text{center at } (0, 0), r = 2$$

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

$$3. \text{center at } (4, 3), r = 9$$

$$(x - 4)^2 + (y - 3)^2 = 81$$

$$4. \text{center at } (7, 1), d = 24$$

$$(x - 7)^2 + (y - 1)^2 = 144$$

$$5. \text{center at } (-5, 2), r = 4$$

$$(x + 5)^2 + (y - 2)^2 = 16$$

$$6. \text{center at } (6, -8), d = 10$$

$$(x - 6)^2 + (y + 8)^2 = 25$$

7. a circle with center at  $(8, 4)$  and a radius with endpoint  $(0, 4)$

$$(x - 8)^2 + (y - 4)^2 = 64$$

8. a circle with center at  $(-2, -7)$  and a radius with endpoint  $(0, 7)$

$$(x + 2)^2 + (y + 7)^2 = 200$$

9. a circle with center at  $(-3, 9)$  and a radius with endpoint  $(1, 9)$

$$(x + 3)^2 + (y - 9)^2 = 16$$

10. a circle whose diameter has endpoints  $(-3, 0)$  and  $(3, 0)$

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

Graph each equation.

$$11. x^2 + y^2 = 16$$



$$12. (x - 1)^2 + (y - 4)^2 = 9$$



$$5. (x + \frac{1}{2})^2 + (y - \frac{1}{4})^2 = 4$$



$$6. x^2 + (y - 1)^2 = 9$$



$$7. (x - 1)^2 + (y - 4)^2 = 9$$



$$8. (x + 2)^2 + (y + 7)^2 = 200$$



$$9. (x + 3)^2 + (y - 9)^2 = 16$$



$$10. (x - 1)^2 + (y - 7)^2 = 9$$



$$11. x^2 + y^2 = 16$$



$$12. (x - 1)^2 + (y - 4)^2 = 9$$



$$13. (x - 7)^2 + (y - 1)^2 = 24$$



$$14. (x + 3)^2 + (y - 9)^2 = 100$$



$$15. (x - 1)^2 + (y - 4)^2 = 16$$



$$16. (x + 2)^2 + (y + 7)^2 = 200$$



$$17. (x - 3)^2 + (y - 9)^2 = 16$$



$$18. (x + 1)^2 + (y - 2)^2 = 6.25$$



$$19. (x - 1)^2 + (y - 1)^2 = 9$$



$$20. (x - 3)^2 + (y - 3)^2 = 9$$



$$21. (x - 1)^2 + (y - 1)^2 = 16$$



$$22. (x - 1)^2 + (y - 1)^2 = 16$$



$$23. (x - 1)^2 + (y - 1)^2 = 16$$



$$24. (x - 1)^2 + (y - 1)^2 = 16$$



$$25. (x - 1)^2 + (y - 1)^2 = 16$$



$$26. (x - 1)^2 + (y - 1)^2 = 16$$



$$27. (x - 1)^2 + (y - 1)^2 = 16$$



$$28. (x - 1)^2 + (y - 1)^2 = 16$$



$$29. (x - 1)^2 + (y - 1)^2 = 16$$



$$30. (x - 1)^2 + (y - 1)^2 = 16$$



$$31. (x - 1)^2 + (y - 1)^2 = 16$$



$$32. (x - 1)^2 + (y - 1)^2 = 16$$



$$33. (x - 1)^2 + (y - 1)^2 = 16$$



$$34. (x - 1)^2 + (y - 1)^2 = 16$$



$$35. (x - 1)^2 + (y - 1)^2 = 16$$



$$36. (x - 1)^2 + (y - 1)^2 = 16$$



$$37. (x - 1)^2 + (y - 1)^2 = 16$$



$$38. (x - 1)^2 + (y - 1)^2 = 16$$



$$39. (x - 1)^2 + (y - 1)^2 = 16$$



$$40. (x - 1)^2 + (y - 1)^2 = 16$$



$$41. (x - 1)^2 + (y - 1)^2 = 16$$



$$42. (x - 1)^2 + (y - 1)^2 = 16$$



$$43. (x - 1)^2 + (y - 1)^2 = 16$$



$$44. (x - 1)^2 + (y - 1)^2 = 16$$



$$45. (x - 1)^2 + (y - 1)^2 = 16$$



$$46. (x - 1)^2 + (y - 1)^2 = 16$$



$$47. (x - 1)^2 + (y - 1)^2 = 16$$



$$48. (x - 1)^2 + (y - 1)^2 = 16$$



$$49. (x - 1)^2 + (y - 1)^2 = 16$$



$$50. (x - 1)^2 + (y - 1)^2 = 16$$



$$51. (x - 1)^2 + (y - 1)^2 = 16$$



$$52. (x - 1)^2 + (y - 1)^2 = 16$$



$$53. (x - 1)^2 + (y - 1)^2 = 16$$



$$54. (x - 1)^2 + (y - 1)^2 = 16$$



$$55. (x - 1)^2 + (y - 1)^2 = 16$$



$$56. (x - 1)^2 + (y - 1)^2 = 16$$



$$57. (x - 1)^2 + (y - 1)^2 = 16$$



$$58. (x - 1)^2 + (y - 1)^2 = 16$$



$$59. (x - 1)^2 + (y - 1)^2 = 16$$



$$60. (x - 1)^2 + (y - 1)^2 = 16$$



$$61. (x - 1)^2 + (y - 1)^2 = 16$$



$$62. (x - 1)^2 + (y - 1)^2 = 16$$



$$63. (x - 1)^2 + (y - 1)^2 = 16$$



$$64. (x - 1)^2 + (y - 1)^2 = 16$$



$$65. (x - 1)^2 + (y - 1)^2 = 16$$



$$66. (x - 1)^2 + (y - 1)^2 = 16$$



$$67. (x - 1)^2 + (y - 1)^2 = 16$$



$$68. (x - 1)^2 + (y - 1)^2 = 16$$

