Name _____ Date _____ Class _____

LESSON 12-2

Practice B

Circles

Write the equation of each circle.

1. Center (8, 9) and radius $r = 10$

_____

2. Center (–1, 5) and containing the point (23, –2)

_____

3. Center (2, 2) and containing the point (–1, 6)

_____

4. Center (3, –5) and containing the point (–7, 11)

_____

5. Center (–3, 0) and radius $r = 6$

_____

6. Center (6, –1) and radius $r = 8$

_____

7. Center (–3, –4) and containing the point (3, 4)

_____

8. Center (5, –5) and containing the point (1, –2)

_____

Write the equation of the line that is tangent to each circle at the given point.

9. $x^2 + y^2 = 169$; (12, 5)

_____

10. $(x - 2)^2 + (y - 1)^2 = 25$; (6, –2)

_____

11. $(x - 7)^2 + (y + 3)^2 = 625$; (0, –21)

_____

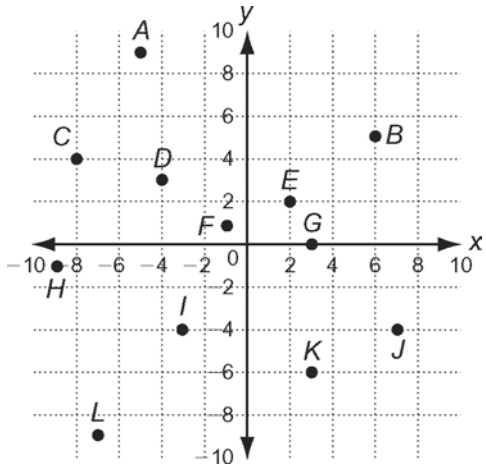
12. $(x + 3)^2 + (y + 6)^2 = 144$; (–3, 6)

_____

Solve.

13. A rock concert is located at the point (–1, 1). The music can be heard up to 4 miles away. Use the equation of a circle to find the locations that are affected. Assume each unit of the coordinate plane represents 1 mile.

_____

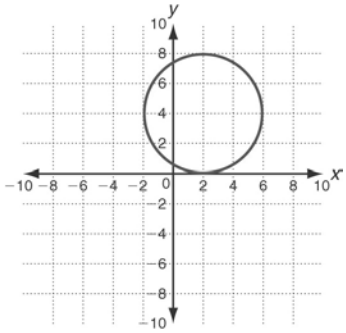


c. (6, 0), (–6, 0)

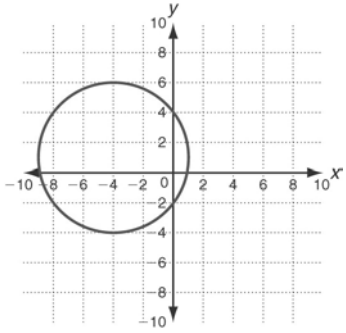
d. Horizontally

Challenge

1. $x = 6$
2. $y = -1$
3. $7x - 5y = 4$
4. A line that is parallel to l and m and midway between them
5. $y = 4$
6. $x = -2$
7. $y = x + 4$
8. A circle with its center at (2, 4) and radius of 4 units



9. A circle with its center at (–4, 1) and radius of 5 units



Problem Solving

1. $\left(\frac{3}{2}, -1\right)$
2. a. Either (4,5) and $\left(\frac{3}{2}, -1\right)$, or (–1,–7) and $\left(\frac{3}{2}, -1\right)$

   b. $6\frac{1}{2}$ units

   c. 13π units
3. a. Possible answer: Find the distance between point C and the center of the circle; compare this distance to the radius.

   b. Hunter is correct. Possible answer: The radius of the circle (6.5 units) is greater than the distance between point C and the center (about 5.4 units.)
4. A
5. J
6. C
7. J

Reading Strategies

1. Yes; possible answer: to find the length of the diameter you only need to know the length of the radius, since the diameter is twice the radius.
2. Possible answer: The endpoints of a diameter will be equidistant from the center of the circle. Both endpoints form radii when connected by a line segment to the center of the circle.
3. a. (4, 8)

   b. $r = 6$

   c. $A = 36\pi$

   d. $C = 12\pi$
4. Possible answer: (–1, 0) and (5, 0)

12-2 CIRCLES

Practice A

1. a. 10

   b. $(x + 8)^2 + (y - 4)^2 = 100$
2. $x^2 + (y - 5)^2 = 4$
3. $(x - 8)^2 + (y + 4)^2 = 1$
4. $(x + 3)^2 + (y - 5)^2 = 36$
5. $(x + 9)^2 + (y + 1)^2 = 16$
6. $(x + 1)^2 + y^2 = 25$
7. $x^2 + y^2 = 625$
8. $(x - 2)^2 + (y + 1)^2 = 29$
9. $(x - 5)^2 + (y - 3)^2 = 109$
10. $(x + 4)^2 + (y - 8)^2 = 25$
11. $(x - 7)^2 + (y + 3)^2 = 16$
12. E, F, G, I, J, K

Practice B

1. $(x - 8)^2 + (y - 9)^2 = 100$

2. $(x+1)^2+(y-5)^2=625$
3. $(x-2)^2+(y-2)^2=25$
4. $(x-3)^2+(y+5)^2=356$
5. $(x+3)^2+y^2=36$
6. $(x-6)^2+(y+1)^2=64$
7. $(x+3)^2+(y+4)^2=100$
8. $(x-5)^2+(y+5)^2=25$
9. $y=-\frac{12}{5}x+\frac{169}{5}$
10. $y=\frac{4}{3}x-10$
11. $y=\frac{-7}{18}x-21$
12. $y=6$
13. D, E, F

Practice C

1. $(x-9)^2+(y+1)^2=49$
2. $(x+5)^2+(y+2)^2=625$
3. $(x-8)^2+(y+3)^2=676$
4. $(x+5)^2+(y-11)^2=225$
5. $x^2+(y+12)^2=100$
6. $(x-7)^2+(y-8)^2=9$
7. $(x-6)^2+(y-1)^2=45$
8. $(x+3)^2+(y-2)^2=29$
9. $y=-\frac{3}{4}x-\frac{15}{4}$
10. $y=-\frac{9}{40}x+\frac{73}{8}$
11. $y=-\frac{4}{3}x+13$
12. $y=\frac{12}{5}x-\frac{618}{5}$
13. $y=-\frac{1}{14}x+\frac{177}{14}$
14. $y=-\frac{24}{7}x-\frac{837}{7}$
15. F, G

Reteach

1. $(x+1)^2+(y-3)^2=36$
2. $4=\sqrt{(x-5)^2+(y+2)^2}$

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

   $(x-5)^2+(y+2)^2=16$
3. $3=\sqrt{(x-4)^2+(y-1)^2}$

   $(x-4)^2+(y-1)^2=9$
4. $8=\sqrt{(x-3)^2+(y-7)^2}$

   $(x-3)^2+(y-7)^2=64$
5. $r=\sqrt{5^2+12^2}=\sqrt{169}=13$

   $(x-3)^2+(y+7)^2=169$
6. $r=\sqrt{(10-4)^2+(13-5)^2}=$

   $\sqrt{6^2+8^2}=\sqrt{100}=10$

   $(x-4)^2+(y-5)^2=100$

Challenge

1. a. h, k, and r

   b. 3

   c. Yes; possible answer: no algebraic operation will combine any two of the constants.
2. a. 3

   b. 3
3. a. $\begin{cases} D-E-F=2 \\ 3D+5E+F=-34 \\ 5D-3E+F=-34 \end{cases}$

   b. $x^2+y^2-\frac{32}{5}x-\frac{8}{5}y-\frac{34}{5}=0$

   c. Center $\left(\frac{16}{5},\frac{4}{5}\right)$; radius $=\frac{\sqrt{442}}{5}$
4. a. $h^2+k^2=r^2$

   b. $\frac{k-1}{h-2}=-\frac{4}{3}$ $(2-h)^2+(1-k)^2=r^2$

   c. $\frac{k-1}{h-2}=-\frac{4}{3}$

   d. $\left(x+\frac{7}{4}\right)^2+(y-6)^2=\frac{625}{16}$
5. $(x-4)^2+(y+2)^2=20$

Problem Solving

1. a. $(x-5)^2+(y-1)^2=100$

   b. P, S, W

   c. Q, R, T, U, V
2. a. $(x-5)^2+(y-1)^2=225$

   b. P, Q, S, T, V, W

   c. 14.9 units
3. C
4. G