## 2.2 EXERCISES

### PRACTICE

Find the standard form of the equation for the circle. See Examples 1 and 2.

**1.** Center $(-4,-3)$; radius 5

**2.** Center at origin; radius 3

**3.** Center $(7,-9)$; radius 3

**4.** Center $(-2, 2)$; radius 2

**5.** Center $(0,0)$; radius $\sqrt{6}$

**6.** Center $(6,3)$; radius 8

**7.** Center $\left(\sqrt{5}, \sqrt{3}\right)$; radius 4

**8.** Center $\left(\frac{5}{3}, \frac{8}{5}\right)$; radius $\sqrt{8}$

**9.** Center $(7,2)$; passes through $(7,0)$

**10.** Center $(3,3)$; passes through $(1,3)$

**11.** Center $(-3,8)$; passes through $(-4,9)$

**12.** Center $(0,0)$; passes through $(2,10)$

**13.** Center $(4,8)$; passes through $(1,9)$

**14.** Center $(12,-4)$; passes through $(-9,5)$

**15.** Center at the origin; passes through $(6,-7)$

**16.** Center $(13,-2)$; passes through $(8,-3)$

**17.** Endpoints of a diameter are $(-8,6)$ and $(1,11)$

**18.** Endpoints of a diameter are $(5,3)$ and $(8,-3)$

**19.** Endpoints of a diameter are $(-7,-4)$ and $(-5,7)$

**20.** Endpoints of a diameter are $(2,3)$ and $(7,4)$

**21.** Endpoints of a diameter are $(0,0)$ and $(-13,-14)$

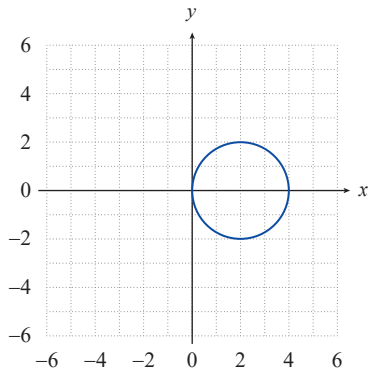
**22.** Endpoints of a diameter are $(4,10)$ and $(0,3)$

**23.** Endpoints of a diameter are $(0,6)$ and $(8,0)$

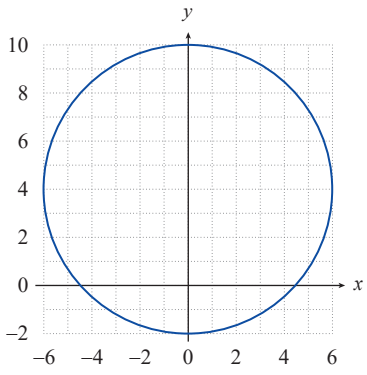
**24.** Endpoints of a diameter are $(6,9)$ and $(4,9)$

Find the standard form of the equation for the circle. See Example 3.

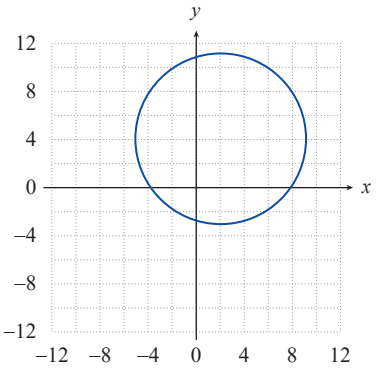
**25.**



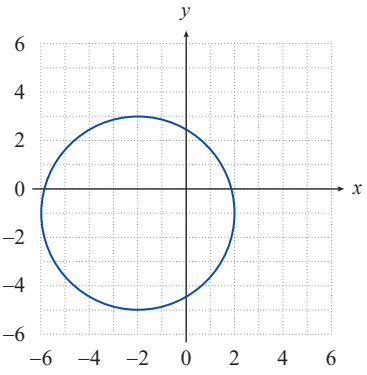

**26.**



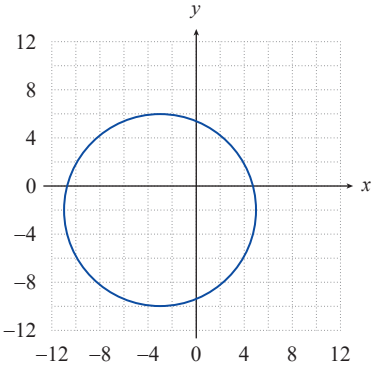

**27.**




**28.**




**29.**




Sketch a graph of the equation and find the center and radius of each circle. See Examples 4 and 5.

**30.** $x^2 + y^2 = 25$

**31.** $x^2 + y^2 = 36$

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

**33.** $x^2 + (y-8)^2 = 9$

**34.** $(x+2)^2 + y^2 = 49$

**35.** $(x-8)^2 + y^2 = 8$

**36.** $(x-9)^2 + (y-4)^2 = 49$

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

**38.** $(x+2)^2+(y-7)^2=64$

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

**40.** $x^2+y^2-2x+10y+1=0$

**41.** $x^2+y^2-4x+4y-8=0$

**42.** $x^2+y^2+6x+5=0$

**43.** $x^2+y^2+10y+9=0$

**44.** $x^2+y^2-x-y=2$

**45.** $x^2+y^2+6y-2x=-2$

**46.** $(x-5)^2+y^2=225$

**47.** $4x^2+4y^2=256$

**48.** $(x-3)^2+(y+2)^2=81$

**49.** $x^2+y^2-6x+4y-3=0$

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

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

**52.** $x^2+(y+2)^2=49$

**53.** $x^2+y^2-4x+8y-16=0$

**54.** $x^2+y^2+8x=9$

**55.** $4x^2+4y^2-24x+24y=28$