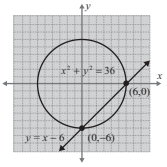
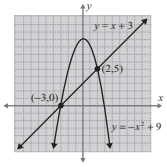
## Attention!

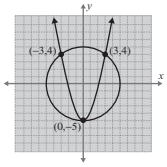
In the examples and the exercises, the curves intersect. However, there are many situations where the curves do **not** intersect. This can be confirmed both algebraically and graphically.

***Margin Exercise Answers***

**1.** $(0, -6)$ and $(6, 0)$. **2.** $(-3, 0)$ and $(2, 5)$. **3.** $(0, -5)$, $(-3, 4)$, and $(3, 4)$.




# 18.5 Exercises

## Concept Check

**Fill-in-the-Blank.** Complete each sentence using information found in this section.

**1.** The equations for the conic sections presented in this lesson all have at least one term that is _____-degree.

**2.** If a system of two equations has one nonlinear equation and one linear equation, then the method of _____ should be used to solve the system.

**3.** If a system of two equations has two nonlinear equations, then either the _____ method or the _____ method will work.

**4.** When solving a nonlinear system of equations, the final step is to _____ the curves on the same set of axes.

**5.** Solutions to a system of two equations must satisfy _____ equations.

**True/False.** Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

**6.** Equations that have at least one second-degree term are called linear equations.

**7.** Graphing a system of equations is useful for approximating solutions.

**8.** Graphing a system of equations will determine the exact number of solutions.

**9.** If a system of equations has two nonlinear equations, the curves must intersect.

## Practice

Solve each system of equations. Sketch the graphs.

**1.** $\begin{cases} y = x^2 + 1 \\ 2x + y = 4 \end{cases}$

**2.** $\begin{cases} y = 3 - x^2 \\ x + y = -3 \end{cases}$

**3.** $\begin{cases} y = 2 - x \\ y = (x - 2)^2 \end{cases}$

**4.** $\begin{cases} x^2 + y^2 = 25 \\ y + x + 5 = 0 \end{cases}$

**5.** $\begin{cases} x^2 + y^2 = 20 \\ x - y = 2 \end{cases}$

**6.** $\begin{cases} x^2 - y^2 = 16 \\ 3x + 5y = 0 \end{cases}$

**7.** $\begin{cases} y = x - 2 \\ x^2 = y^2 + 16 \end{cases}$

**8.** $\begin{cases} x^2 + 3y^2 = 12 \\ x = 3y \end{cases}$

**9.** $\begin{cases} x^2 + y^2 = 9 \\ x^2 - y^2 = 9 \end{cases}$

**10.** $\begin{cases} x^2 + y^2 = 9 \\ x^2 - y + 3 = 0 \end{cases}$

**11.** $\begin{cases} 4x^2 + y^2 = 25 \\ 3x - y^2 + 3 = 0 \end{cases}$

**12.** $\begin{cases} x^2 - 4y^2 = 9 \\ x + 2y^2 = 3 \end{cases}$

**13.** $\begin{cases} x^2 + y^2 + 4x - 2y = 4 \\ x + y = 2 \end{cases}$

**14.** $\begin{cases} x^2 - y^2 = 9 \\ x^2 + y^2 - 2x - 3 = 0 \end{cases}$

**15.** $\begin{cases} x^2 - y^2 = 5 \\ x^2 + 4y^2 = 25 \end{cases}$

**16.** $\begin{cases} 2x^2 - 3y^2 = 6 \\ 2x^2 + y^2 = 22 \end{cases}$

Solve each system of equations.

**17.** $\begin{cases} x^2 - y^2 = 20 \\ x^2 - 9y = 0 \end{cases}$

**18.** $\begin{cases} x^2 + 5y^2 = 16 \\ x^2 + y^2 = 4x \end{cases}$

**19.** $\begin{cases} x^2 + y^2 = 10 \\ x^2 + y^2 - 4y + 2 = 0 \end{cases}$

**20.** $\begin{cases} x^2 + y^2 = 20 \\ 4x + 8 = y^2 \end{cases}$

**21.** $\begin{cases} x^2 + y^2 - 4y = 16 \\ x - y = 0 \end{cases}$

**22.** $\begin{cases} y = x^2 + 2x + 2 \\ 2x + y = 2 \end{cases}$

**23.** $\begin{cases} 4y + 10x^2 + 7x - 8 = 0 \\ 6x - 8y + 1 = 0 \end{cases}$

**24.** $\begin{cases} x^2 + y^2 - 4x + 6y = -3 \\ 2x - y - 2 = 0 \end{cases}$

**25.** $\begin{cases} 2x^2 - y^2 = 7 \\ 2x^2 + y^2 = 29 \end{cases}$

**26.** $\begin{cases} 4x^2 + y^2 = 11 \\ y = 4x^2 - 9 \end{cases}$

**27.** $\begin{cases} x^2 - y^2 - 2y = 22 \\ 2x + 5y + 5 = 0 \end{cases}$

**28.** $\begin{cases} x^2 + y^2 - 6y = 0 \\ 2x^2 - y^2 + 15 = 0 \end{cases}$

**29.** $\begin{cases} y = x^2 - 2x + 3 \\ y = -x^2 + 2x + 3 \end{cases}$

**30.** $\begin{cases} y^2 = x^2 - 5 \\ 4x^2 - y^2 = 32 \end{cases}$

Use a graphing calculator to graph and estimate the solution(s) to each system of equations. If necessary, round values to two decimal places.

**31.** $\begin{cases} y = x^2 + 3 \\ x + y = 4 \end{cases}$

**32.** $\begin{cases} y = 1 - x^2 \\ x + y = -4 \end{cases}$

**33.** $\begin{cases} y = 3 - 2x \\ y = (x - 1)^2 \end{cases}$

**34.** $\begin{cases} x^2 + y^2 = 36 \\ y = x + 5 \end{cases}$

**35.** $\begin{cases} x^2 + y^2 = 10 \\ x - y = 1 \end{cases}$

**36.** $\begin{cases} x^2 + y^2 = 4 \\ x^2 - y^2 = 3 \end{cases}$