

Study Guide

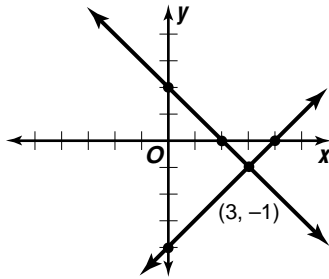
Student Edition
Pages 454–461

Graphing Systems of Equations

Two or more linear equations involving the same variables form a **system of equations**. The solution set for the system is the set of ordered pairs that satisfy both equations. One method for solving a system of equations is to graph the equations on the same coordinate plane.

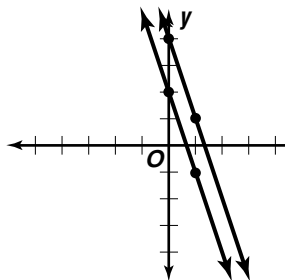
Examples: Solve each system of equations by graphing.

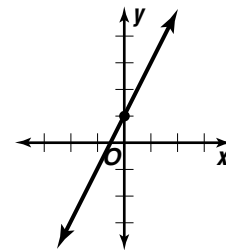
$$\begin{aligned}x + y &= 2 \\x - y &= 4\end{aligned}$$



The point $(3, -1)$ lies on both lines, thus $(3, -1)$ is the solution set for the system of equations.

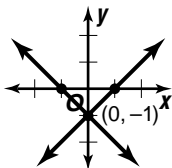
$$\begin{aligned}3x + y &= 2 \\3x + y &= 4 \\ \text{no solution}\end{aligned}$$



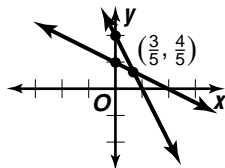
$$\begin{aligned}y &= 2x + 1 \\2y &= 4x + 2 \\ \text{infinitely many solutions}\end{aligned}$$


Use the graphs below to determine whether each system has one solution, no solution, or infinitely many solutions. If the system has one solution, name it.

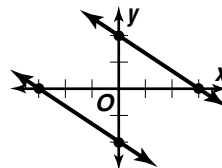
1. $x - y = 1$
 $x + y = -1$



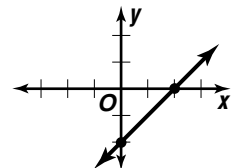
2. $x + 3y = 3$
 $2x + y = 2$



3. $2x + 3y = 6$
 $2x + 3y = -6$



4. $x - y = 2$
 $2x - 2y = 4$



Graph each system of equations on a separate sheet of paper. Then determine whether the system has one solution, no solution, or infinitely many solutions. If the system has one solution, name it.

5. $4x - 2y = 4$
 $4x - 2y = 0$

6. $y = x + 2$
 $y = 2x - 1$

7. $x + y = 1$
 $3x + 3y = 3$

8. $2x - 2y = 2$
 $y = x$