

7.1

Solve Linear Systems by Graphing

Goal • Graph and solve systems of linear equations.

Your Notes

VOCABULARY

Systems of linear equations A system of linear equations consists of two or more linear equations in the same variables.

Solution of a system of linear equations A solution of a system of linear equations in two variables is an ordered pair that satisfies each equation in the system.

Consistent independent system A linear system that has exactly one solution

SOLVING A LINEAR SYSTEM USING THE GRAPH-AND-CHECK METHOD

Step 1 Graph both equations in the same coordinate plane. For ease of graphing, you may want to write each equation in slope-intercept form.

Step 2 **Estimate** the coordinates of the point of intersection.

Step 3 Check the coordinates algebraically by substituting into each equation of the original linear system.

Your Notes

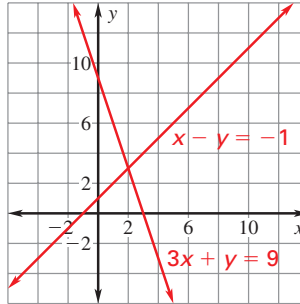
Example 1 Use the graph-and-check method

$$\text{Solve the linear system: } 3x + y = 9 \quad \text{Equation 1}$$

$$x - y = 1 \quad \text{Equation 2}$$

Solution

1. **Graph** both equations.



To ease graphing, write each equation in slope intercept form.

2. **Estimate** the point of intersection. The two lines appear to intersect at (2 , 3).

3. **Check** whether (2 , 3) is a solution by substituting 2 for x and 3 for y in each of the original equations.

Equation 1

$$3x + y = 9$$

$$\underline{3(2) + 3} \stackrel{?}{=} 9$$

$$\underline{9} = 9 \checkmark$$

Equation 2

$$x - y = -1$$

$$\underline{2 - 3} \stackrel{?}{=} -1$$

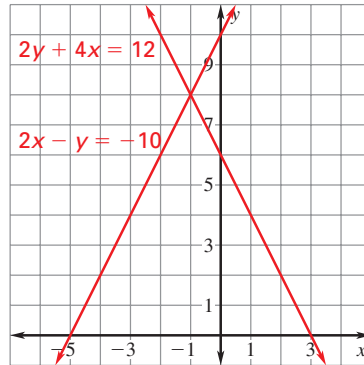
$$\underline{-1} = -1 \checkmark$$

Because (2 , 3) is a solution of each equation in the linear system, it is a solution of the linear system.

Your Notes

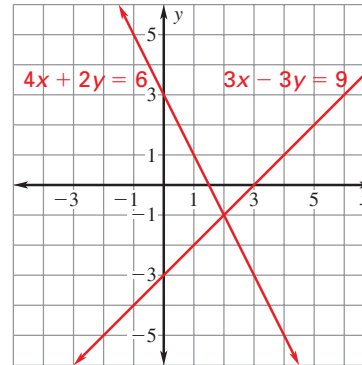
Checkpoint Solve the linear system by graphing.

1. $2y + 4x = 12$
 $2x - y = -10$



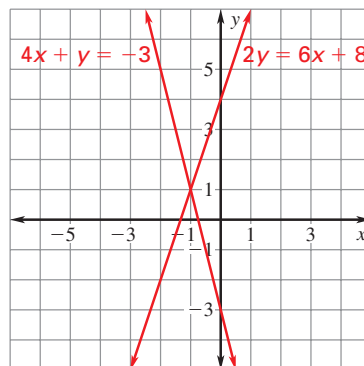
$(-1, 8)$

2. $4x + 2y = 6$
 $3x - 3y = 9$



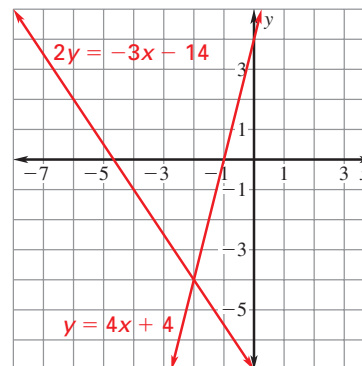
$(2, -1)$

3. $2y = 6x + 8$
 $4x + y = -3$



$(-1, 1)$

4. $y = 4x + 4$
 $2y = -3x - 14$



$(-2, -4)$

Homework