7.4 Solve Linear Systems by Multiplying First

pp. 398–404

Alg. 9.0 | **EXAMPLE**

Solve the linear system: $x - 2y = -7$ **Equation 1**
$\qquad\qquad\qquad\qquad\quad 3x - y = 4$ **Equation 2**

STEP 1 **Multiply** the first equation by -3.

$\begin{array}{ll} x - 2y = -7 & \times (-3) \\ 3x - y = 4 & \end{array} \quad \begin{array}{l} -3x + 6y = 21 \\ \underline{3x -\ y = 4} \end{array}$

STEP 2 **Add** the equations. $\qquad\qquad\qquad\quad 5y = 25$

STEP 3 **Solve** for y. $\qquad\qquad\qquad\qquad\qquad y = 5$

STEP 4 **Substitute** 5 for y in either of the original equations and solve for x.

$\qquad x - 2y = -7$ **Write Equation 1.**

$\qquad x - 2(5) = -7$ **Substitute 5 for y.**

$\qquad\qquad x = 3$ **Solve for x.**

▶ The solution is (3, 5). You can check the solution by substituting 3 for x and 5 for y in each of the original equations.

EXERCISES

**EXAMPLES
1 and 2**
on pp. 398–399
for Exs. 13–15

Solve the linear system using elimination.

13. $x + 6y = 28$
$\quad\ 2x - 3y = -19$

14. $3x - 5y = -7$
$\quad\ -4x + 7y = 8$

15. $5x = 3y - 2$
$\quad\ 3x + 2y = 14$

7.5 Solve Special Types of Linear Systems

pp. 405–411

Alg. 9.0 | **EXAMPLE**

Show that the linear system has no solution. $\quad -2x + y = -3$ **Equation 1**
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad y = 2x + 1$ **Equation 2**

Rewrite $-2x + y = -3$ as $y = 2x - 3$. Then graph the linear system.

The lines are parallel because they have the same slope but different y-intercepts. Parallel lines do not intersect, so the system has no solution.

EXERCISES

**EXAMPLES
1, 2, and 3**
on pp. 405–407
for Exs. 16–18
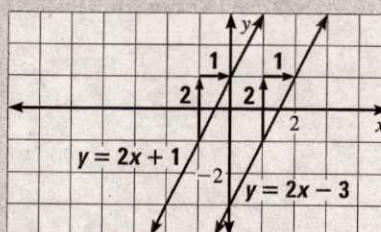
Tell whether the linear system has *one solution, no solution,* or *infinitely many solutions. Explain.*

16. $x = 2y - 3$
$\quad\ 1.5x - 3y = 0$

17. $-x + y = 8$
$\quad\ x + 8 = y$

18. $4x = 2y + 6$
$\quad\ 4x + 2y = 10$