

EXAMPLE 3 Identify the number of solutions

Without solving the linear system, tell whether the linear system has *one solution*, *no solution*, or *infinitely many solutions*.

a. $5x + y = -2$ Equation 1
 $-10x - 2y = 4$ Equation 2

b. $6x + 2y = 3$ Equation 1
 $6x + 2y = -5$ Equation 2

Solution

a. $y = -5x - 2$ Write Equation 1 in slope-intercept form.

$y = -5x - 2$ Write Equation 2 in slope-intercept form.

▶ Because the lines have the same slope and the same y -intercept, the system has infinitely many solutions.

b. $y = -3x + \frac{3}{2}$ Write Equation 1 in slope-intercept form.

$y = -3x - \frac{5}{2}$ Write Equation 2 in slope-intercept form.

▶ Because the lines have the same slope but different y -intercepts, the system has no solution.

EXAMPLE 4 Write and solve a system of linear equations

ART An artist wants to sell prints of her paintings. She orders a set of prints for each of two of her paintings. Each set contains regular prints and glossy prints, as shown in the table. Find the cost of one glossy print.

Regular	Glossy	Cost
45	30	\$465
15	10	\$155

Solution

STEP 1 Write a linear system. Let x be the cost (in dollars) of a regular print, and let y be the cost (in dollars) of a glossy print.

$45x + 30y = 465$ Cost of prints for one painting

$15x + 10y = 155$ Cost of prints for other painting

STEP 2 Solve the linear system using elimination.

$$\begin{array}{r} 45x + 30y = 465 \\ 15x + 10y = 155 \quad \times (-3) \rightarrow \\ \hline 45x + 30y = 465 \\ -45x - 30y = -465 \\ \hline 0 = 0 \end{array}$$

▶ There are infinitely many solutions, so you cannot determine the cost of one glossy print. You need more information.

**GUIDED PRACTICE** for Examples 3 and 4

3. Without solving the linear system, tell whether it has *one solution*, *no solution*, or *infinitely many solutions*.

$x - 3y = -15$ Equation 1

$2x - 3y = -18$ Equation 2

4. **WHAT IF?** In Example 4, suppose a glossy print costs \$3 more than a regular print. Find the cost of a glossy print.