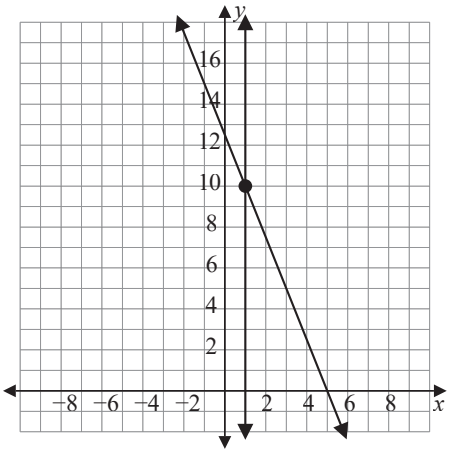



The two lines appear to intersect at the point (1,10). This can be checked by substituting 1 for $x$ and 10 for $y$ in both equations.

**b.** We can solve either equation for either variable and the choice will not affect the final answer. We will solve for $y$ in the first equation.

$$\begin{aligned} -5x - 2y &= -25 \\ -2y &= 5x - 25 \\ y &= \frac{-5x + 25}{2} \end{aligned}$$

We know from the second equation:

$$\begin{aligned} 5x &= 5 \\ x &= 1 \end{aligned}$$

To find the numerical value for $y$, we substitute 1 for $x$ into the expression we obtained for $y$ in the first step.

$$y = \frac{-5(1) + 25}{2} = 10$$

Therefore, the solution to the system of equations is (1,10).

# 9.R.1 Exercises

## Concept Check

**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.)

**1.** To check a solution, substitute it into one of the equations. If the solution satisfies one equation it will satisfy all of the equations.

**2.** A system of equations with graphs that are parallel lines has exactly one solution.

**3.** A system of equations with graphs that intersect at one point has exactly one solution.

**4.** A system of equations with graphs that are the same line has infinitely many solutions.

## Practice

Determine which of the given points, if any, lie on both of the lines in the systems of equations by substituting each point into both equations.

**5.** $\begin{cases} 2x+4y-6=0 \\ 3x+6y-9=0 \end{cases}$

**a.** $(1, 1)$

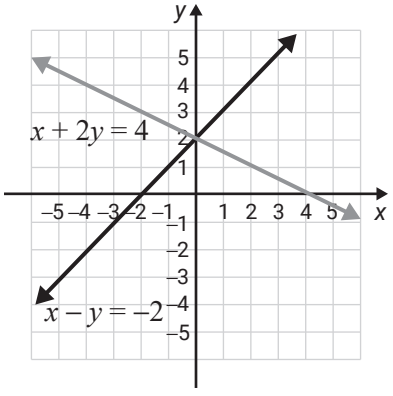
**b.** $(2, 0)$

**c.** $\left(0, \frac{3}{2}\right)$

**d.** $(-1, 3)$

The graphs of the lines represented by system of equations are given. Determine the solution of the system by looking at the graph. Check your solution by substituting into both equations.

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



Solve each system of equations by graphing.

**7.** $\begin{cases} x-2y=4 \\ x=4 \end{cases}$

**8.** $\begin{cases} 2x+y=0 \\ 4x+2y=-8 \end{cases}$

## Applications

Each of the following applications has been modeled using a system of equations. Solve the system graphically.

**9.** ***Swimming Pools:*** OSHA recommends that swimming pool owners clean their pool decks with a solvent composed of a 12% chlorine solution and a 3% chlorine solution. Fifteen gallons of the solvent consists of 6% chlorine. How much of each of the mixing solutions were used?

Let $x$ = the number of gallons of the 12% solution

and $y$ = the number of gallons of the 3% solution.

The corresponding modeling system is $\begin{cases} x+y=15 \\ 0.12x+0.03y=0.06(15) \end{cases}$

**10.** ***School Supplies:*** A student bought a calculator and a textbook for a course in algebra. He told his friend that the total cost was \$170 (without tax) and that the calculator cost \$20 more than twice the cost of the textbook. What was the cost of each item?

Let $x$ = the cost of the calculator

and $y$ = the cost of the textbook.

The corresponding modeling system is $\begin{cases} x + y = 170 \\ x = 2y + 20 \end{cases}$

## Writing & Thinking

**11.** Explain, in your own words, why the answer to a consistent system of linear equations can be written as an ordered pair.