Lesson 1.9.1: Solving Systems of Linear Equations by **Substitution Method**

- 1. Solve one equation for one variable in terms of the other variable.
- 2. Substitute the expression obtained in STEP 1 into the other equation.
- §3. Solve the resulting equation in one variable.
- 4. Find the value of the other variable by substituting the solution found in STEP 3 into any equation containing both variables.
- 5. Check the solution in the original equations.

Practice Exercises 1.9.1

Find the solutions of the following systems of linear equations using the substitution method.

$$1. \left\{ \begin{array}{rcl} x+y & = & 12 \\ x-y & = & 8 \end{array} \right.$$

4.
$$\begin{cases} x + y &= 3 \\ x + y &= -2 \end{cases}$$

1.
$$\begin{cases} x+y &= 12 \\ x-y &= 8 \end{cases}$$
2.
$$\begin{cases} 3x+6y &= 4 \\ 6x+12y &= 8 \end{cases}$$
4.
$$\begin{cases} x+y &= 3 \\ x+y &= -2 \end{cases}$$
5.
$$\begin{cases} x-8y &= 2 \\ 3x-24y &= 6 \end{cases}$$

5.
$$\begin{cases} x - 8y = 2 \\ 3x - 24y = 6 \end{cases}$$

$$3. \begin{cases} 8 = x+y \\ -4 = x-y \end{cases}$$

Activity 1.9.1

Find the solutions of the following systems of linear equations using the substitution method.

tions using the substitution method:
1.
$$\begin{cases} y = \frac{2}{3}x + 6 & 3. \begin{cases} 4x - y = 8 \\ 3x + 2y = 6 \end{cases} \\ y = -\frac{3}{2}x + 6 & 4. \begin{cases} x + 4y = 8 \\ x - 2y = 2 \end{cases} \end{cases}$$
2.
$$\begin{cases} x + y = 7 \\ x - y = 1 \end{cases}$$
5.
$$\begin{cases} x + y = 5 \\ y = 5x + \frac{1}{2} \end{cases}$$

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3. Solve the resulting equation in one variable.

5. Check the solution in the original equations.

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