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

Activity 1.9.1

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

1. $\begin{cases} y &= \frac{2}{3}x+6 \\ y &= -\frac{3}{2}x+6 \end{cases}$
2. $\begin{cases} x+y &= 7 \\ x-y &= 1 \end{cases}$
3. $\begin{cases} 4x-y &= 8 \\ 3x+2y &= 6 \end{cases}$
4. $\begin{cases} x+4y &= 8 \\ x-2y &= 2 \end{cases}$
5. $\begin{cases} x+y=5 \\ y=5x+\frac{1}{2} \end{cases}$

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