

CH.5, L5 – SOLVING SYSTEMS OF EQUATIONS WITH ELIMINATION

Objective: Given a system of equations, SWBAT solve the system by elimination

Think About It: Given the system of equations below, is it a legal mathematical move to combine the two equations in the system as shown in the example? If it is, continue to solve the system of equations and explain how this can help to solve the system. If it is not, solve the system another way to determine the solution.

Original System:

$$\begin{cases} 4x + 2y = 20 \\ x - 2y = 5 \end{cases}$$

First Step:

$$\begin{array}{r} 4x + 2y = 20 \\ + \quad x - 2y = 5 \\ \hline 3x + 0y = 15 \end{array}$$

Key Point:

_____ equations
with _____
coefficients will
_____ out variables.

Check:

$$4x + 2y = 20$$

$$x - 2y = 5$$

Keyword(s): combine, eliminate

Big Idea:

CFS:

1. When needed, equations in system are rewritten so that one variable is canceled
2. System is solved by combining equations and eliminating a variable
3. All steps are shown to find solution (x, y)
4. Solution is checked

Interaction with New Material:**Ex. 1)** Solve the system using elimination

$$\begin{cases} 3x + 4y = 6 \\ 5x + 2y = 3 \end{cases}$$

Step 1: Combine System**Step 2:** Solve other variable**Solution** (____, ____)**Ex. 2)** Solve the system using elimination

$$\begin{cases} 2x + 2y = 4 \\ 3x - 3y = 0 \end{cases}$$

Step 1: Combine System**Step 2:** Solve other variable**Solution** (____, ____)**Check:**

$$3x + 4y = 6$$

$$5x + 2y = 3$$

Check:

$$2x + 2y = 4$$

$$3x - 3y = 0$$

CFS:

1. When needed, equations in system are rewritten so that one variable is canceled
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Partner Practice: For questions 1 – 6, solve the system of equations using elimination and check your solutions.

1.
$$\begin{cases} 2x + 3y = 15 \\ 5x - 3y = 6 \end{cases}$$

Check:

$$2x + 3y = 15$$

$$5x - 3y = 6$$

2.
$$\begin{cases} 7x + 2y = 24 \\ 8x + 2y = 30 \end{cases}$$

Check:

$$7x + 2y = 24$$

$$8x + 2y = 30$$

CFS:

1. When needed, equations in system are rewritten so that one variable is canceled
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$$3. \begin{cases} 14x - 8y = 20 \\ 7x + y = -20 \end{cases}$$

Check:

$$14x - 8y = 20$$

$$7x + y = -20$$

$$4. \begin{cases} 8x + 3y = 10 \\ -2x - 10y = 16 \end{cases}$$

Check:

$$8x + 3y = 10$$

$$-2x - 10y = 16$$

CFS:

1. When needed, equations in system are rewritten so that one variable is canceled
2. System is solved by combining equations and eliminating a variable
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4. Solution is checked

5.
$$\begin{cases} -5x + 10y = 15 \\ -3x + 8y = 17 \end{cases}$$

Check:

$$-5x + 10y = 15$$

$$-3x + 8y = 17$$

6.
$$\begin{cases} 10x - 4y = 28 \\ -7x + 7y = -7 \end{cases}$$

Check:

$$10x - 4y = 28$$

$$-7x + 7y = -7$$

CFS:

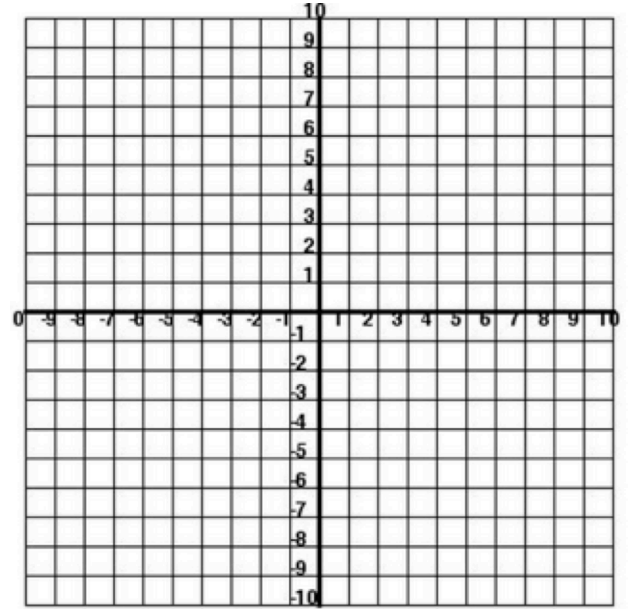
1. When needed, equations in system are rewritten so that one variable is canceled
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7. Solve the following system of equations by graphing, substitution, and elimination. **Time yourself using the classroom clock and record your times.** Verify all three methods produce the same solution and make an argument for which method is best for this specific system.

$$\begin{cases} 5x + 4y = -14 \\ 3x + 6y = 6 \end{cases}$$

Elimination:

Graphing:



Substitution:

Check:

$$4x + 2y = 20$$

$$x - 2y = 5$$

CFS:

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