

INDEPENDENT VARIABLE

IDV WORKSHEETS



SOLVING SYSTEMS BY ELIMINATION

ADD OR SUBTRACT | MULTIPLY ONE | MULTIPLY BOTH

ANIMATED
POWERPOINT:
DOES THE WORK
FOR YOU!

FULL ANSWER
KEYS
INCLUDED

GUIDED PROBLEM 2 • GUIDED PROBLEMS: ADD OR SUBTRACT
Solve by Elimination

Solve by elimination: $4x + 3y = 23$ and $x + 3y = 8$

$$\begin{array}{r} 4x + 3y = 23 \\ - \quad x + 3y = 8 \\ \hline 3x = 15 \\ x = 5 \end{array}$$

DECIDE $3y$ and $3y$ are the same:
SUBTRACT.

SUBTRACT Subtract straight down.
 $3y - 3y = 0$

DIVIDE Divide by 3.

$$4(5) + 3y = 23, y = 1$$

FIND y Put $x = 5$ into the first equation.

PART 3 • GUIDED PROBLEM 9 • GUIDED PROBLEMS: MULTIPLY FIRST • CHALLENGE
Solve by Elimination

Solve by elimination: $3x + 4y = 5$ and $2x - 3y = 9$

$$\begin{array}{r} \times 3 \quad 9x + 12y = 15 \\ + \quad 8x - 12y = 36 \\ \hline 17x = 51 \\ x = 3 \end{array}$$

MULTIPLY Multiply the top by 3.
Now it has $12y$.

MULTIPLY Multiply the bottom by 4.
 $12y$ and $-12y$: opposite

ADD Add straight down.
 $12y + (-12y) = 0$

DIVIDE Divide by 17.

$$3(3) + 4y = 5, y = -1$$

Solution: $(3, -1)$

FIND y Put $x = 3$ into the first

9 EXAMPLE
PROBLEMS
4 PRACTICE
SHEETS

LEVELED
PRACTICE +
FIND THE
MISTAKE

MORE PRACTICE. LESS PREP. BETTER OUTCOMES.

Inside the Animated Lesson

INDEPENDENT VARIABLE

GRADE 8 • SYSTEMS OF EQUATIONS

SOLVING SYSTEMS BY ELIMINATION

ADD OR SUBTRACT | MULTIPLY ONE | MULTIPLY BOTH

Animated PowerPoint lesson
9 animated systems, every move shown
Practice A, B, C • Find the Mistake

$$\begin{array}{r} x + y = 10 \\ x - y = 4 \\ \hline 2x = 14 \\ (7, 3) \end{array}$$

MORE PRACTICE, LESS PREP, BETTER OUTCOMES.
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LESSON OVERVIEW

Today's Goals

I CAN...

- Decide: add, subtract, or multiply first.
- Eliminate a variable. Solve for the other.
- Find the second value. Write (x, y).

KEY VOCABULARY

Eliminate make a variable cancel out	Opposites 2y and -2y: add
Coefficient the number in front of a variable	Multiply an equation EVERY term, the number too
Same coefficients 2x and 2x: subtract	Solution the point (x, y) that works in both

STANDARDS
CCSS 8.EE.C.8b CCSS HSA.REI.C.5 CCSS HSA.REI.C.6

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PART 1 • NOTES

Add or Subtract?

NOTES • GUIDED PROBLEMS: ADD OR SUBTRACT

Same coefficients (2x and 2x)? **SUBTRACT** straight down.

Opposite coefficients (2y and -2y)? **ADD** straight down.

Solve. Put the answer into the **first equation**. Write (x, y).

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PART 1 • GUIDED PROBLEM 1 • GUIDED PROBLEMS: ADD OR SUBTRACT

Solve by Elimination

Solve by elimination: $x + y = 10$ and $x - y = 4$ FIND y

$$\begin{array}{r} x + y = 10 \\ + \quad x - y = 4 \\ \hline 2x = 14 \\ x = 7 \end{array}$$

DECIDE y and -y are opposites: ADD.

ADD Add straight down. $y + (-y) = 0$

DIVIDE Divide by 2.

$7 + y = 10, y = 3$
Solution: (7, 3)

FIND y Put x = 7 into the first equation.

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PART 1 • GUIDED PROBLEM 2 • GUIDED PROBLEMS: ADD OR SUBTRACT

Solve by Elimination

Solve by elimination: $4x + 3y = 23$ and $x + 3y = 8$ FIND y

$$\begin{array}{r} 4x + 3y = 23 \\ - \quad x + 3y = 8 \\ \hline 3x = 15 \\ x = 5 \end{array}$$

DECIDE 3y and 3y are the same: SUBTRACT.

SUBTRACT Subtract straight down. $3y - 3y = 0$

DIVIDE Divide by 3.

$4(5) + 3y = 23, y = 1$
Solution: (5, 1)

FIND y Put x = 5 into the first equation.

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PART 2 • NOTES

Multiply One Equation

NOTES • GUIDED PROBLEMS: MULTIPLY FIRST

Not the same? Not opposites? **Multiply ONE** equation to make opposites. Then add.

Multiply **EVERY** term, the number after the = too.

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PART 2 • GUIDED PROBLEM 5 • GUIDED PROBLEMS: MULTIPLY FIRST

Solve by Elimination

Solve by elimination: $3x + 2y = 12$ and $x - y = 9$ FIND y

$$\begin{array}{r} 3x + 2y = 12 \\ + \quad 2x - 2y = 18 \\ \hline 5x = 30 \\ x = 6 \end{array}$$

MULTIPLY Multiply the bottom by 2. 2y and -2y: opposites!

ADD Add straight down. $2y + (-2y) = 0$

DIVIDE Divide by 5.

$3(6) + 2y = 12, y = -3$
Solution: (6, -3)

FIND y Put x = 6 into the first equation.

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PART 3 • GUIDED PROBLEM 9 • GUIDED PROBLEMS: MULTIPLY FIRST • CHALLENGE

Solve by Elimination

Solve by elimination: $3x + 4y = 5$ and $2x - 3y = 9$ FIND y

$$\begin{array}{r} \times 3 \quad 9x + 12y = 15 \\ + \quad 8x - 12y = 36 \\ \hline 17x = 51 \\ x = 3 \end{array}$$

MULTIPLY Multiply the top by 3. Now it has 12y.

MULTIPLY Multiply the bottom by 4. 12y and -12y: opposites!

ADD Add straight down. $12y + (-12y) = 0$

DIVIDE Divide by 17.

$3(3) + 4y = 5, y = -1$
Solution: (3, -1)

FIND y Put x = 3 into the first equation.

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Directions: Fill in the notes. Copy and solve each system as it is shown.

NOTES

Same coefficients ($2x$ and $2x$)? _____ straight down.
Opposite coefficients ($2y$ and $-2y$)? _____ straight down.
Solve. Put the answer into the _____. Write (x, y) .

PART 1: ADD OR SUBTRACT

1.	2.
3.	4.

Directions: Same coefficients: subtract. Opposites: add. Write the solution (x, y).

1. $\begin{cases} 7x + 2y = 23 \\ 8x + 2y = 24 \end{cases}$	2. $\begin{cases} 7x + 2y = 22 \\ 5x - 2y = 2 \end{cases}$	3. $\begin{cases} 3x + y = 26 \\ 2x + y = 19 \end{cases}$
4. $\begin{cases} 2x + 6y = 24 \\ 5x - 6y = 18 \end{cases}$	5. $\begin{cases} 9x + 3y = 30 \\ 3x + 3y = 12 \end{cases}$	6. $\begin{cases} x + 2y = 12 \\ 2x - 2y = 6 \end{cases}$
7. $\begin{cases} 8x + y = 21 \\ 4x - y = 3 \end{cases}$	8. $\begin{cases} 5x + 4y = 21 \\ 6x + 4y = 22 \end{cases}$	9. $\begin{cases} x + y = 12 \\ 3x + y = 20 \end{cases}$

Directions: Fill in the notes. Copy and solve each system as it is shown.

NOTES

Not the same? Not opposites? _____ ONE equation to make opposites. Then add.

Multiply _____ term, the number after the = too.

Multiplying one will not work? Multiply _____ equations to make opposites. Then add.

PART 2: MULTIPLY ONE EQUATION

5.

6.

7.

PART 3: MULTIPLY BOTH EQUATIONS

8.

9.

CHALLENGE

Directions: Multiply one equation first (every term!). Write the solution (x, y).

1. $\begin{cases} -4x + 7y = -11 \\ -2x + 21y = -23 \end{cases}$	2. $\begin{cases} 4x - 2y = -26 \\ 7x + 4y = -38 \end{cases}$	3. $\begin{cases} -4x - 2y = 8 \\ 6x - 4y = -40 \end{cases}$
4. $\begin{cases} 4x - y = -28 \\ -5x + 2y = 29 \end{cases}$	5. $\begin{cases} x + 2y = 20 \\ -5x + 4y = -2 \end{cases}$	6. $\begin{cases} 7x + 6y = 8 \\ -2x - 12y = 8 \end{cases}$
7. $\begin{cases} 5x + y = -1 \\ 7x - 2y = -32 \end{cases}$	8. $\begin{cases} -2x - y = 14 \\ 9x - 3y = -33 \end{cases}$	9. $\begin{cases} -5x + 7y = 3 \\ -4x + 14y = 36 \end{cases}$