LESSON MAKER PRO

System Solver

Write and solve linear systems with confidence.

HIGH SCHOOL · MA.912.AR.9.1

MA.912.AR.9.1 "Given a mathematical or real-world context, write and solve a system of two-variable linear equations algebraically or graphically."

NAME _____ **DATE** _____

CHOOSE A STRATEGY

A system of linear equations has values of x and y that make both equations true. Use substitution when a variable is easy to isolate, or use elimination when adding or subtracting the equations will cancel a variable. Check your ordered pair in both equations.

WORKED EXAMPLE

Solve the system: $x + y = 17$ and $x - y = 5$.

1. Add the equations: $2x = 22$.
2. Divide by 2: $x = 11$.
3. Substitute $x = 11$ into $x + y = 17$: $11 + y = 17$.
4. Solve: $y = 6$.

Answer: (x, y) = (11, 6)

PRACTICE 6 problems

1 Solve the system: $x + y = 7$ and $x - y = 1$.

ANSWER _____

2 Solve the system: $4x + y = 19$ and $x + y = 10$.

ANSWER _____

3 Solve the system: $3x + y = 16$ and $x + y = 8$.

ANSWER _____

4 Solve the system: $x + 4y = 19$ and $3x - y = 18$.

ANSWER _____

5 Solve the system: $4x + y = 21$ and $x + y = 12$.

ANSWER _____

6 Solve the system: $3x + 4y = 25$ and $x + y = 7$.

ANSWER _____

APPLY IT Show your work

1 At a school game, premium tickets cost $14 and student tickets cost $8. A total of 13 tickets were sold for $158. Let x represent premium tickets and y represent student tickets. Write and solve a system to find how many of each ticket were sold.

WORK SPACE

ANSWER _____

2 A club fundraiser sells basic stickers for $3 and holographic stickers for $7. The club sells 16 stickers and earns $76. Let x represent basic stickers and y represent holographic stickers. Write and solve a system to find how many of each sticker were sold.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve the system: 9x + 4y = 43 and 4x - 4y = -4. Then explain why adding the equations is an efficient strategy.

WORK SPACE AND ANSWER

ANSWER KEY # System Solver

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve the system: x + y = 7 and x - y = 1.	**(x, y) = (4, 3)**
2	Solve the system: 4x + y = 19 and x + y = 10.	**(x, y) = (3, 7)**
3	Solve the system: 3x + y = 16 and x + y = 8.	**(x, y) = (4, 4)**
4	Solve the system: x + 4y = 19 and 3x - y = 18.	**(x, y) = (7, 3)**
5	Solve the system: 4x + y = 21 and x + y = 12.	**(x, y) = (3, 9)**
6	Solve the system: 3x + 4y = 25 and x + y = 7.	**(x, y) = (3, 4)**

PART 2 · APPLY IT

1. **9 premium tickets and 4 student tickets** Use x + y = 13 and 14x + 8y = 158. Substitute y = 13 - x into the revenue equation to get x = 9, then y = 4.
2. **9 basic stickers and 7 holographic stickers** Use x + y = 16 and 3x + 7y = 76. Substitute x = 16 - y into the money equation to get y = 7, then x = 9.

CHALLENGE

x = 3, y = 4. Adding the equations cancels y immediately, so it is more efficient than first isolating a variable.

Accept correct ordered pairs and equivalent algebraic work. For the word problems, accept systems with variables defined in the opposite order if the final ticket or sticker quantities are labeled correctly.