

System Solver Lab

Solve, apply, and explain systems of equations.

GRADE 8 • NY-8.EE.8.c

NY-8.EE.8.c "Solve real-world and mathematical problems involving systems of two linear equations in two variables with integer coefficients."

NAME _____

DATE _____

PART 1: PRACTICE

A system's solution is an ordered pair that makes both equations true. Use substitution when one variable is easy to isolate, or use elimination to cancel one variable by adding or subtracting equations.

WORKED EXAMPLE

Solve the system: $7x + 11y = 111$ and $x + y = 13$.

1. From $x + y = 13$, write $x = 13 - y$.
2. Substitute: $7(13 - y) + 11y = 111$, so $4y = 20$.
3. Solve for y : $y = 5$.
4. Use $x = 13 - 5$, so $x = 8$.

Answer: (8, 5)

PRACTICE 6 problems

1 Solve the system: $x + y = 10$ and $x - y = 2$.

ANSWER _____

2 Solve the system: $3x + 2y = 24$ and $x + y = 10$.

ANSWER _____

3 Solve the system: $4x - y = 3$ and $2x + y = 15$.

ANSWER _____

4 Solve the system: $4x + 2y = 2$ and $3x - 2y = 12$.

ANSWER _____

5 Solve the system: $2x + 4y = 22$ and $3x - y = 26$.

ANSWER _____

6 Solve the system. State whether it has one solution, no solution, or infinitely many solutions: $2x + 6y = 18$ and $x + 3y = 12$.

ANSWER _____

APPLY IT Show your work

- 1** At a school game night, 3 pretzels and 2 juices cost \$18. Two pretzels and 3 juices cost \$17. What is the price of one pretzel and one juice?

WORK SPACE

ANSWER _____

- 2** For a club fundraiser, 4 keychains and 3 pins cost \$24. Two keychains and 6 pins cost \$30. What is the price of one keychain and one pin?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Use elimination to solve the system: $4x + 9y = 70$ and $6x - 2y = 12$. Then verify that your ordered pair makes both equations true.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve the system: $x + y = 10$ and $x - y = 2$.	(6, 4)
2	Solve the system: $3x + 2y = 24$ and $x + y = 10$.	(4, 6)
3	Solve the system: $4x - y = 3$ and $2x + y = 15$.	(3, 9)
4	Solve the system: $4x + 2y = 2$ and $3x - 2y = 12$.	(2, -3)
5	Solve the system: $2x + 4y = 22$ and $3x - y = 26$.	(9, 1)
6	Solve the system. State whether it has one solution, no solution, or infinitely many solutions: $2x + 6y = 18$ and $x + 3y = 12$.	No solution

PART 2 • APPLY IT

- One pretzel costs \$4, and one juice costs \$3.** Let p be the pretzel price and j be the juice price. Solve $3p + 2j = 18$ and $2p + 3j = 17$ to get $p = 4$ and $j = 3$.
- One keychain costs \$3, and one pin costs \$4.** Let k be the keychain price and p be the pin price. Solve $4k + 3p = 24$ and $2k + 6p = 30$ to get $k = 3$ and $p = 4$.

CHALLENGE

$x = 4$ and $y = 6$. Multiplying the first equation by 3 and the second equation by 2 gives $12x + 27y = 210$ and $12x - 4y = 24$, so $31y = 186$ and $y = 6$. Then $x = 4$. Check: $4(4) + 9(6) = 70$ and $6(4) - 2(6) = 12$.

Accept equivalent elimination or substitution work and ordered pairs written as $x = \text{value}$, $y = \text{value}$. For the last practice problem, accept a correct explanation that the equations have equal left-side expressions but different constants.