

System Solver Lab

Use elimination and substitution to find where two equations agree.

HIGH SCHOOL • HSA-REI.C.6

CCSS.Math.Content.HSA-REI.C.6 "Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables."

NAME _____

DATE _____

ONE PAIR, TWO RULES

A solution to a system is an ordered pair that makes both equations true. Use elimination or substitution to find the pair, then check it in both equations. If the equations describe the same line, there are infinitely many solutions. If they describe different parallel lines, there is no solution.

WORKED EXAMPLE

Solve the system. $13x + 17y = 159$

$11x - 17y = 9$

1. Add the equations: $24x = 168$.
2. Divide by 24: $x = 7$.
3. Substitute: $11(7) - 17y = 9$.
4. Solve for y : $y = 4$.

Answer: (7, 4)

PRACTICE 6 problems

1 Solve the system. $x + y = 20$ $x - y = 8$

ANSWER _____

2 Solve the system. $2x + 3y = 22$ $x + y = 8$

ANSWER _____

3 Solve the system. $y = 2x - 10$ $y = -x + 8$

ANSWER _____

4 Solve the system. $6x + 10y = 32$ $3x + 5y = 16$

ANSWER _____

5 Solve the system. $x + 3y = 15$ $2x + 6y = 31$

ANSWER _____

6 Solve the system. $5x - 2y = 21$ $3x + 2y = 19$

ANSWER _____

APPLY IT Show your work

- 1** A school music festival sells 30 tickets. Student tickets cost \$6 each, and adult tickets cost \$10 each. The festival collects \$240. How many student tickets and adult tickets are sold?

WORK SPACE

ANSWER _____

- 2** A club sells 18 pieces of spirit wear. T-shirts cost \$12 each, and hoodies cost \$20 each. The club collects \$264. How many T-shirts and hoodies are sold?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Find the value of k that makes this system have infinitely many solutions. Explain in one sentence how you know. $10x - 15y = 25$ $2x - 3y = k$

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve the system. $x + y = 20$ $x - y = 8$	(14, 6)
2	Solve the system. $2x + 3y = 22$ $x + y = 8$	(2, 6)
3	Solve the system. $y = 2x - 10$ $y = -x + 8$	(6, 2)
4	Solve the system. $6x + 10y = 32$ $3x + 5y = 16$	Infinitely many solutions
5	Solve the system. $x + 3y = 15$ $2x + 6y = 31$	No solution
6	Solve the system. $5x - 2y = 21$ $3x + 2y = 19$	(5, 2)

PART 2 · APPLY IT

- 15 student tickets and 15 adult tickets** Let s be student tickets and a be adult tickets. Solve $s + a = 30$ and $6s + 10a = 240$.
- 12 T-shirts and 6 hoodies** Let t be T-shirts and h be hoodies. Solve $t + h = 18$ and $12t + 20h = 264$.

CHALLENGE

$k = 5$, because dividing the first equation by 5 gives $2x - 3y = 5$.

Accept equivalent ordered-pair notation and correct substitution or elimination work. For the special cases, accept "infinitely many solutions" or "no solution" with a correct explanation about equivalent or parallel lines.