LESSON MAKER PRO

Where Lines Meet

Find the pair that satisfies both equations.

HIGH SCHOOL · A-REI.6

A-REI.6 "Solve systems of linear equations algebraically, exactly using algebraic processes and approximately (e.g., graphically) while focusing on pairs of linear equations in two variables."

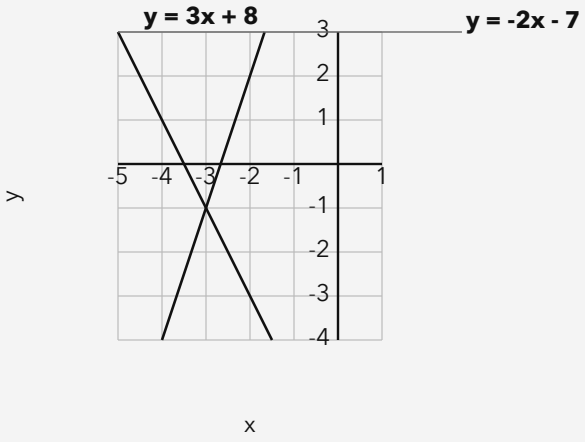
NAME _____ DATE _____

TWO WAYS TO SOLVE

A system's solution makes both equations true. Set two expressions for y equal, or add equations to cancel a variable. A graph shows where the lines cross; use algebra to find the exact point.

WORKED EXAMPLE

Solve y = 3x + 8 and y = -2x - 7. Use the graph to check your answer.



1. Set the expressions equal: 3x + 8 = -2x - 7.
2. Combine terms: 5x = -15, so x = -3.
3. Substitute: y = 3(-3) + 8 = -1.

Answer: (-3, -1). The lines cross at this point.

PRACTICE 4 problems

1 Find x and y: x + y = 14; x - y = 4.

ANSWER _____

2 Find x and y: y = 4x + 6; y = -5x + 42.

ANSWER _____

3 Find x and y: 5x + 4y = 34; 5x - 4y = 6.

ANSWER _____

4 Find x and y: 4x + 6y = 25; 4x - 6y = 5.

ANSWER _____

APPLY IT Show your work

1 At a school concert, 2 student tickets and 5 adult tickets cost $56. Four student tickets and 3 adult tickets cost $84. Find each ticket price.

WORK SPACE

ANSWER _____

2 Music app A costs $12 plus $5 per song. App B costs $28 plus $3 per song. For how many songs do they cost the same, and what is the cost?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student says $6x + 4y = 28$ and $9x + 6y = 42$ have one solution because there are two equations. Explain why this is incorrect.

WORK SPACE AND ANSWER

ANSWER KEY

Where Lines Meet

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find x and y: x + y = 14; x - y = 4.	**x = 9, y = 5**
2	Find x and y: y = 4x + 6; y = -5x + 42.	**x = 4, y = 22**
3	Find x and y: 5x + 4y = 34; 5x - 4y = 6.	**x = 4, y = 7/2**
4	Find x and y: 4x + 6y = 25; 4x - 6y = 5.	**x = 15/4, y = 5/3**

PART 2 · APPLY IT

1. **Student: $18; adult: $4** Let s and a be the ticket prices. Solve 2s + 5a = 56 and 4s + 3a = 84.
2. **8 songs; $52** Set 12 + 5n = 28 + 3n to get n = 8. Substitute into either cost expression.

CHALLENGE

The second equation is 3/2 times the first. They describe the same line, so every point on that line is a solution. There are infinitely many solutions.

Accept ordered pairs in place of separate x and y values. For the challenge, accept any explanation that identifies the equations as equivalent and states that there are infinitely many solutions.