LESSON MAKER PRO

Where Lines Meet

Solve pairs of equations and find what their shared point means.

GRADE 8 · 8.EE.8c

8.EE.8c "Analyze and solve pairs of simultaneous linear equations. Solve simple real-world and mathematical problems leading to two linear equations in two variables given y = mx + b form with integer solutions."

NAME _____ DATE _____

FIND THE SHARED VALUES

At the point where two lines meet, both equations have the same x-value and the same y-value. Set the expressions for y equal, solve for x, then substitute x into either equation to find y.

WORKED EXAMPLE

Solve the system: y = 7x + 19 and y = -4x + 41.

1. Set the expressions equal: 7x + 19 = -4x + 41.
2. Add 4x and subtract 19: 11x = 22.
3. Divide by 11: x = 2.
4. Substitute: y = 7(2) + 19 = 33.

Answer: (2, 33)

PRACTICE 6 problems

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

ANSWER _____

2 Solve the system: y = -3x + 11 and y = x - 5. Find x and y.

ANSWER _____

3 Solve the system: y = 4x - 6 and y = -2x + 24. Find x and y.

ANSWER _____

4 Solve the system: y = 5x + 2 and y = 2x - 13. Find x and y.

ANSWER _____

5 Solve the system: y = -x - 6 and y = 3x + 10. Find x and y.

ANSWER _____

6 Solve the system: y = 1/2x + 5 and y = -1/2x + 11. Find x and y.

ANSWER _____

APPLY IT Show your work

1 Two music plans charge a signup fee plus a monthly fee. For x months, Plan A costs y = 6x + 18 dollars, and Plan B costs y = 9x + 6 dollars. After how many months will the total costs match? What will each plan cost then?

WORK SPACE

ANSWER _____

2 Two school clubs track their online followers. After x weeks, the art club expects y = 8x + 34 followers, and the chess club expects y = 14x + 4 followers. After how many weeks will they expect the same number of followers? How many followers will each expect?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two pairs of equations share one solution. The first pair is y = 2x + 5 and y = -x + 14. The second pair is y = 4x - 1 and y = -2x + 17. Find the shared solution. Explain how you know it satisfies all four equations.

WORK SPACE AND ANSWER

ANSWER KEY

Where Lines Meet

GRADE 8 · 8.EE.8c

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve the system: y = 2x + 1 and y = -x + 10. Find x and y.	**x = 3, y = 7**
2	Solve the system: y = -3x + 11 and y = x - 5. Find x and y.	**x = 4, y = -1**
3	Solve the system: y = 4x - 6 and y = -2x + 24. Find x and y.	**x = 5, y = 14**
4	Solve the system: y = 5x + 2 and y = 2x - 13. Find x and y.	**x = -5, y = -23**
5	Solve the system: y = -x - 6 and y = 3x + 10. Find x and y.	**x = -4, y = -2**
6	Solve the system: y = 1/2x + 5 and y = -1/2x + 11. Find x and y.	**x = 6, y = 8**

PART 2 · APPLY IT

1. **After 4 months, each plan costs $42.** Set 6x + 18 = 9x + 6 to get x = 4. Substitute into either equation to get y = 42.
2. **After 5 weeks, each club expects 74 followers.** Set 8x + 34 = 14x + 4 to get x = 5. Substitute to get y = 74.

CHALLENGE

The shared solution is (3, 11). Setting the first pair equal gives 2x + 5 = -x + 14, so x = 3 and y = 11. In the second pair, 4(3) - 1 = 11 and -2(3) + 17 = 11.

Accept ordered pairs or separately labeled x- and y-values. For the challenge, accept any correct method that checks the solution in all four equations.