LESSON MAKER PRO

Where Lines Meet

Solve systems and make sense of their solutions.

HIGH SCHOOL · A1.A.1.3

A1.A.1.3 "Analyze, use, and apply mathematical models to solve problems involving systems of linear equations with a maximum of two variables by graphing, substitution, and elimination..."

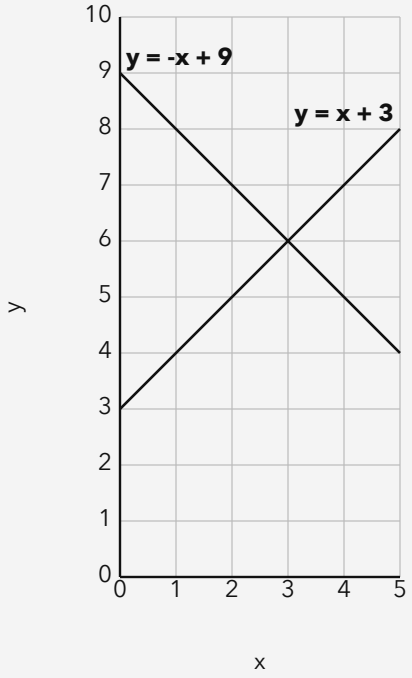
NAME _____ DATE _____

ONE SOLUTION, TWO EQUATIONS

A solution to a system makes both equations true. On a graph, look for where the lines cross. You can also use substitution or elimination to find the values, then explain what they mean in a real situation.

WORKED EXAMPLE

Find the intersection of the two lines in the graph. Use substitution to check your answer.

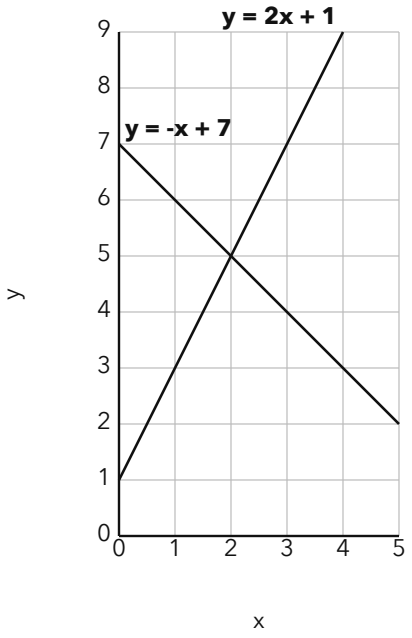


1. The lines appear to meet at (3, 6).
2. Set their y-values equal: x + 3 = -x + 9.
3. Solve: 2x = 6, so x = 3.
4. Substitute: y = 3 + 3 = 6.

Answer: (3, 6)

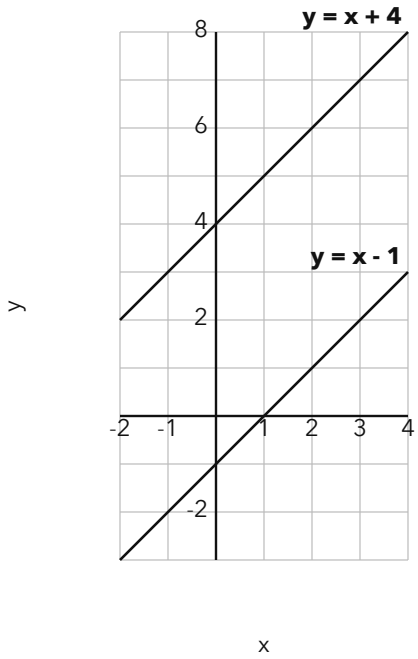
PRACTICE 6 problems

1 Use the graph to find the point where the lines meet.



ANSWER _____

2 Use the graph to decide whether the system has one solution, no solution, or infinitely many solutions.



ANSWER _____

3 Use substitution to solve: y = 3x - 2 and x + y = 14.

ANSWER _____

4 Use substitution to solve: x = 2y + 1 and x + y = 13.

ANSWER _____

5 Use elimination to solve: 2x + 3y = 17 and 2x - y = 5.

ANSWER _____

6 Use elimination to solve: 3x + 2y = 16 and 3x - 2y = 8.

ANSWER _____

APPLY IT Show your work

1 A school concert sells student tickets for $18 and adult tickets for $30. A group buys 8 tickets for $180. How many of each ticket did the group buy? Write a system and interpret its solution.

WORK SPACE

ANSWER _____

2 Two phone plans charge by the gigabyte (GB) of data used each month. Plan A costs $10 plus $4 per GB. Plan B costs $25 plus $1 per GB. At how many GB do the plans cost the same, and what is that cost? Write a system and interpret its solution.

WORK SPACE

ANSWER _____

CHALLENGE One step up

At a school event, 2 regular passes and 3 VIP passes cost $75. Another group pays $150 for 4 regular passes and 6 VIP passes. Can you find one price for each type of pass? Explain why or why not, and give two possible price pairs.

WORK SPACE AND ANSWER

ANSWER KEY

Where Lines Meet

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the graph to find the point where the lines meet.	**(2, 5)**
2	Use the graph to decide whether the system has one solution, no solution, or infinitely many solutions.	**No solution.**
3	Use substitution to solve: y = 3x - 2 and x + y = 14.	**x = 4, y = 10**
4	Use substitution to solve: x = 2y + 1 and x + y = 13.	**x = 9, y = 4**
5	Use elimination to solve: 2x + 3y = 17 and 2x - y = 5.	**x = 4, y = 3**
6	Use elimination to solve: 3x + 2y = 16 and 3x - 2y = 8.	**x = 4, y = 2**

PART 2 · APPLY IT

1. **5 student tickets and 3 adult tickets.** Let s be student tickets and a be adult tickets. Solve s + a = 8 and 18s + 30a = 180 to get s = 5 and a = 3.
2. **At 5 GB, both plans cost $30.** Let x be GB used and y be monthly cost in dollars. Solve y = 10 + 4x and y = 25 + x to get x = 5 and y = 30.

CHALLENGE

No. The second purchase doubles both the number of passes and the cost, so it gives the same equation as the first purchase. A regular pass could cost $15 and a VIP pass $15, or a regular pass could cost $30 and a VIP pass $5.

Accept ordered pairs or labeled x- and y-values for the practice systems. For the challenge, accept any two distinct nonnegative price pairs that each satisfy 2r + 3v = 75.