LESSON MAKER PRO

Where Lines Meet

Check algebraic solutions against graphs and tables.

HIGH SCHOOL · A1P.AF.C.10.b

A1P.AF.C.10.b "Contrast solutions to a system of two linear equations in two variables produced by algebraic methods with graphical and tabular methods."

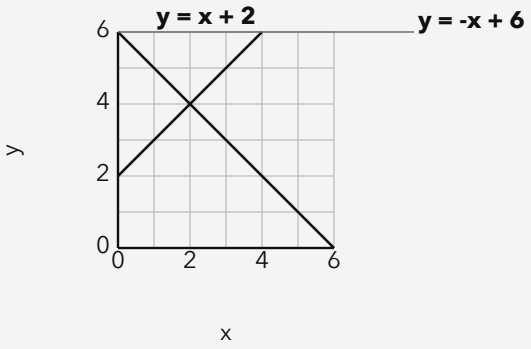
NAME _____ DATE _____

THREE WAYS TO CHECK

A solution to two linear equations makes both equations true. Solve algebraically to find the exact point, then check whether the lines meet there on a graph or whether both equations give the same value in a table.

WORKED EXAMPLE

Solve y = x + 2 and y = -x + 6. Compare your answer with the graph.



1. Set the expressions for y equal: x + 2 = -x + 6.
2. Solve: 2x = 4, so x = 2.
3. Substitute: y = 2 + 2 = 4.

Answer: The solution is (2, 4), the point where the lines meet.

PRACTICE 4 problems

1 Solve y = 2x + 1 and y = -x + 7. Where would the lines meet on a graph?

ANSWER _____

2 A graph suggests (3, 4) for y = x + 1 and y = 2x - 2. Solve algebraically. Does it agree?

ANSWER _____

3 Solve y = 3x - 2 and y = x + 4. Which (x, y) row would be the same for both equations?

ANSWER _____

4 A graph suggests (2, 2) for y = x and y = -2x + 9. Solve algebraically. Is the estimate correct?

ANSWER _____

APPLY IT Show your work

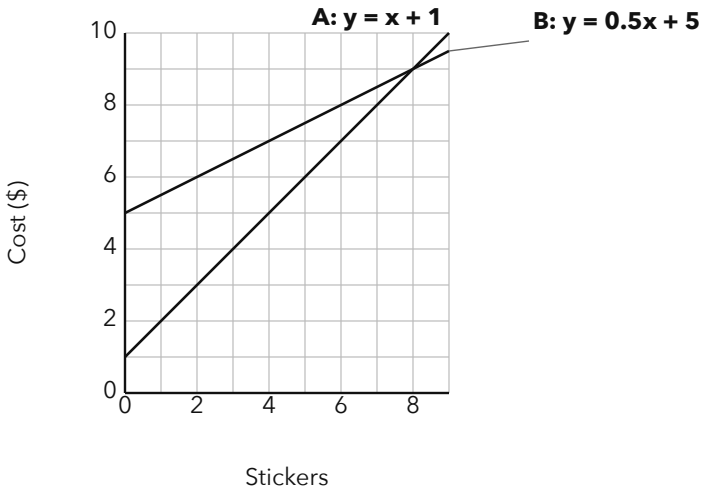
1 Two gaming cafés charge by the hour. Café A charges $4 plus $3 per hour. Café B charges $12 plus $1 per hour. Find when their costs match. How does the table confirm your answer?

GAMING CAFÉ COSTS

Hours	Café A ($)	Café B ($)
0	4	12
2	10	14
4	16	16
5	19	17

ANSWER _____

2 Shop A charges $1 plus $1 per sticker. Shop B charges $5 plus $0.50 per sticker. Use algebra to find when the costs match, then check the graph.



ANSWER _____

CHALLENGE One step up

Without drawing, solve $y = 2x + 3$ and $2y = 4x + 6$. Explain what a graph and a table would show.

WORK SPACE AND ANSWER

ANSWER KEY

Where Lines Meet

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve y = 2x + 1 and y = -x + 7. Where would the lines meet on a graph?	**(2, 5)**
2	A graph suggests (3, 4) for y = x + 1 and y = 2x - 2. Solve algebraically. Does it agree?	**Yes. Algebra gives (3, 4).**
3	Solve y = 3x - 2 and y = x + 4. Which (x, y) row would be the same for both equations?	**(3, 7)**
4	A graph suggests (2, 2) for y = x and y = -2x + 9. Solve algebraically. Is the estimate correct?	**No. The solution is (3, 3).**

PART 2 · APPLY IT

1. **After 4 hours, both cafés cost $16. The table shows 16 in both columns at 4 hours.** Solve 4 + 3h = 12 + h to get h = 4. Substitute to get a cost of $16.
2. **At 8 stickers, both shops charge $9. The lines meet at (8, 9).** Solve 1 + x = 5 + 0.5x to get x = 8. Either cost rule gives $9.

CHALLENGE

There are infinitely many solutions because dividing the second equation by 2 gives y = 2x + 3. The graph would show one line for both equations. A table would show matching y-values for every x-value.

Accept an ordered pair or a statement giving both coordinates. For the challenge, accept equivalent explanations that the equations describe the same line.