LESSON MAKER PRO

Both Must Fit

Test coordinate pairs in two equations.

HIGH SCHOOL · MT.CORE.ALG.LIN.5

MT.CORE.ALG.LIN.5 "Understand that a solution to a system of equations is a coordinate pair that makes both equations true."

NAME _____ DATE _____

THE BIG IDEA

A solution to a system is one coordinate pair that makes both equations true. Substitute its x- and y-values into each equation. If either equation is false, the pair is not a solution.

WORKED EXAMPLE

Does (8, -9) solve both $y = 5x - 49$ and $7x + y = 47$?

1. First equation: $-9 = 5(8) - 49$.
2. Simplify: $-9 = -9$, so the first equation is true.
3. Second equation: $7(8) + (-9) = 47$.
4. Simplify: $47 = 47$, so the second equation is true.

Answer: Yes, (8, -9) solves both equations.

PRACTICE 6 problems

1 Does (2, 3) solve both $y = x + 1$ and $2x + y = 7$?

ANSWER _____

2 Does (-1, 4) solve both $y = -2x + 2$ and $x + y = 3$?

ANSWER _____

3 Does (3, -2) solve both $y = -x + 1$ and $x - 2y = 10$?

ANSWER _____

4 Does (-2, 1) solve both $y = 3x + 7$ and $x - 2y = -4$?

ANSWER _____

5 Which pair solves both $y = -x + 2$ and $2x + y = 2$: (0, 2) or (2, 0)?

ANSWER _____

6 The pair (x, 5) solves both $y = 2x - 1$ and $x + y = 8$. Find x and check the pair in both equations.

ANSWER _____

APPLY IT Show your work

1 Two sites sell tickets for a gaming event. Site A charges $4 per ticket plus a $12 booking fee, so y = 4x + 12. Site B charges $6 per ticket plus a $4 booking fee, so y = 6x + 4. Here, x is the number of tickets and y is the total cost in dollars. Does (4, 28) show a purchase that costs the same on both sites?

WORK SPACE

ANSWER _____

2 Two ride services charge by the mile. Service A charges $3 plus $2 per mile, so y = 2x + 3. Service B charges $9 plus $1 per mile, so y = x + 9. Here, x is the number of miles and y is the cost in dollars. A friend says (4, 11) gives the same cost on both services. Is your friend right? Check both costs.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Find the coordinate pair that solves both y = 2x + 1 and y = -x + 10. Show that your pair makes both equations true.

WORK SPACE AND ANSWER

Both Must Fit

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Does (2, 3) solve both y = x + 1 and 2x + y = 7?	**Yes. 3 = 2 + 1 and 2(2) + 3 = 7.**
2	Does (-1, 4) solve both y = -2x + 2 and x + y = 3?	**Yes. 4 = -2(-1) + 2 and -1 + 4 = 3.**
3	Does (3, -2) solve both y = -x + 1 and x - 2y = 10?	**No. The first equation is true, but 3 - 2(-2) = 7, not 10.**
4	Does (-2, 1) solve both y = 3x + 7 and x - 2y = -4?	**Yes. 1 = 3(-2) + 7 and -2 - 2(1) = -4.**
5	Which pair solves both y = -x + 2 and 2x + y = 2: (0, 2) or (2, 0)?	**(0, 2). It makes both equations true.**
6	The pair (x, 5) solves both y = 2x - 1 and x + y = 8. Find x and check the pair in both equations.	**x = 3. The pair (3, 5) works because 5 = 2(3) - 1 and 3 + 5 = 8.**

PART 2 · APPLY IT

1. **Yes. Four tickets cost $28 on each site.** Site A costs 4(4) + 12 = 28 dollars. Site B costs 6(4) + 4 = 28 dollars.
2. **No. At 4 miles, Service A costs $11 and Service B costs $13.** Substitute x = 4: Service A costs 2(4) + 3 = 11 dollars, while Service B costs 4 + 9 = 13 dollars. The pair makes only the first equation true.

CHALLENGE

(3, 7). Since 2(3) + 1 = 7 and -(3) + 10 = 7, the pair makes both equations true.

Accept equivalent substitution checks. A pair is a solution only when both equations are true.