LESSON MAKER PRO

System Solver

Use two equations to find two unknown values.

GRADE 8 · 8.FGR.7.1

8.FGR.7.1 "Interpret and solve relevant mathematical problems leading to two linear equations in two variables."

NAME _____ DATE _____

THE BIG IDEA

A system of linear equations has two equations with the same two variables. The solution is the ordered pair that makes both equations true. Use substitution or elimination to find the pair, then check it in both equations.

WORKED EXAMPLE

Solve the system: $2x + y = 11$ and $x - y = 1$.

1. Add the equations: $2x + y + x - y = 11 + 1$.
2. $3x = 12$, so $x = 4$.
3. Substitute into $x - y = 1$: $4 - y = 1$, so $y = 3$.

Answer: (4, 3)

PRACTICE 6 problems

1 Solve the system: $x + y = 18$ and $x - y = 8$.

ANSWER _____

2 Solve the system: $5x + y = 37$ and $x + y = 13$.

ANSWER _____

3 Solve the system: $7x + y = 50$ and $x + y = 14$.

ANSWER _____

4 Solve the system: $3x + 2y = 24$ and $x + 2y = 16$.

ANSWER _____

5 Solve the system: $4x + 3y = 35$ and $2x - y = 5$.

ANSWER _____

6 Solve the system: $3x + 4y = 38$ and $x + y = 12$.

ANSWER _____

APPLY IT Show your work

1 An esports event sells 26 tickets. Student tickets cost $4 each, and adult tickets cost $7 each. The event collects $140. How many student tickets and adult tickets are sold?

WORK SPACE

ANSWER _____

2 At a school snack stand, smoothies cost $3 and wraps cost $5. The stand sells 22 items and collects $86. How many smoothies and wraps are sold?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve the system using elimination: 2x + 3y = 28 and 5x - 2y = 13. Then write one sentence explaining why multiplying the first equation by 2 and the second equation by 3 helps.

WORK SPACE AND ANSWER

ANSWER KEY # System Solver

GRADE 8 · 8.FGR.7.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve the system: x + y = 18 and x - y = 8.	**(13, 5)**
2	Solve the system: 5x + y = 37 and x + y = 13.	**(6, 7)**
3	Solve the system: 7x + y = 50 and x + y = 14.	**(6, 8)**
4	Solve the system: 3x + 2y = 24 and x + 2y = 16.	**(4, 6)**
5	Solve the system: 4x + 3y = 35 and 2x - y = 5.	**(5, 5)**
6	Solve the system: 3x + 4y = 38 and x + y = 12.	**(10, 2)**

PART 2 · APPLY IT

1. **14 student tickets and 12 adult tickets** Let s be student tickets and a be adult tickets. Solve s + a = 26 and 4s + 7a = 140 to get s = 14 and a = 12.
2. **12 smoothies and 10 wraps** Let s be smoothies and w be wraps. Solve s + w = 22 and 3s + 5w = 86 to get s = 12 and w = 10.

CHALLENGE

x = 5, y = 6; multiplying the first equation by 2 and the second equation by 3 creates opposite y-terms, 6y and -6y, so y cancels.

Accept equivalent ordered-pair notation and correct substitution or elimination work. For word problems, accept answers that clearly name both quantities in either order.