LESSON MAKER PRO

# System Sleuths

*Solve each pair of equations exactly.*

**GRADE 8 · 8.FGR.7.4**

**8.FGR.7.4** "Analyze and solve systems of two linear equations in two variables algebraically to find exact solutions."

NAME _____ DATE _____

## ELIMINATE AND SUBSTITUTE

Use elimination to cancel one variable by adding or subtracting the equations. Then substitute the value you find into either original equation to find the other variable. Check both values in both equations.

## WORKED EXAMPLE

Solve the system: $x + y = 17$ and $4x - y = 18$.

1. Add the equations: $5x = 35$.
2. Divide by 5: $x = 7$.
3. Substitute into $x + y = 17$: $7 + y = 17$.
4. Subtract 7: $y = 10$.

**Answer: x = 7, y = 10**

## PRACTICE 6 problems

**1** Solve the system: $2x + 3y = 30$ and $2x - y = 6$.

**ANSWER** _____

**2** Solve the system: $3x + 2y = 28$ and $6x - 2y = 20$.

**ANSWER** _____

**3** Solve the system: $6x + 8y = 64$ and $3x - 8y = 8$.

**ANSWER** _____

**4** Solve the system: $9x + 6y = 129$ and $3x + 6y = 75$.

**ANSWER** _____

**5** Solve the system: $11x + 6y = 120$ and $2x - 6y = -42$.

**ANSWER** _____

**6** Solve the system: $6x + 9y = 94$ and $3x - 6y = -37$.

**ANSWER** _____

## APPLY IT Show your work

**1** A gaming tournament sells 14 entry passes and collects $108. A standard pass costs $6, and a VIP pass costs $9. How many standard passes and VIP passes are sold?

WORK SPACE

**ANSWER** _____

**2** At a lunch pop-up, a group buys 24 snacks. Fruit cups cost $2 each, wraps cost $6 each, and the total is $92. How many fruit cups and wraps are bought?

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

Solve the system. Show how you expand the parentheses before you eliminate a variable: $6(x - 6) + 8y = 54$ and $9x - 6(y + 6) = -45$.

WORK SPACE AND ANSWER

**ANSWER KEY** # System Sleuths

**GRADE 8 · 8.FGR.7.4**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Solve the system: 2x + 3y = 30 and 2x - y = 6. | **x = 6, y = 6** |
| 2 | Solve the system: 3x + 2y = 28 and 6x - 2y = 20. | **x = 16/3, y = 6** |
| 3 | Solve the system: 6x + 8y = 64 and 3x - 8y = 8. | **x = 8, y = 2** |
| 4 | Solve the system: 9x + 6y = 129 and 3x + 6y = 75. | **x = 9, y = 8** |
| 5 | Solve the system: 11x + 6y = 120 and 2x - 6y = -42. | **x = 6, y = 9** |
| 6 | Solve the system: 6x + 9y = 94 and 3x - 6y = -37. | **x = 11/3, y = 8** |

## PART 2 · APPLY IT

1. **6 standard passes and 8 VIP passes** Let s be standard passes and v be VIP passes. Solve s + v = 14 and 6s + 9v = 108.
2. **13 fruit cups and 11 wraps** Let f be fruit cups and w be wraps. Solve f + w = 24 and 2f + 6w = 92.

## CHALLENGE

**x = 13/3, y = 8**

Accept any correct elimination or substitution work and equivalent exact forms, including ordered pairs. For the word problems, accept answers only when the quantities are matched to the correct item type.