Name _____ Class _____ Date _____

Reteaching 2-3

Equations With Variables on Both Sides

OBJECTIVE: Solve equations with variables on both sides

MATERIALS: None

To solve equations with variables on both sides, use these strategies:

- Rewrite the equation until all terms with variables are combined on one side and all constant terms are combined on the other side. As you rewrite the equation, use inverse operations and the equality properties.
- When you perform an operation on one side, you must do the same on the other.

Example

Solve $5a - 12 = 3a + 7$.

$5a - 12 = 3a + 7$ ←	**Circle all the terms with variables.**
$5a \boxed{- 12} = 3a \boxed{+ 7}$ ←	**Put rectangles around all constant terms. Plan steps to collect variable terms on one side and constant terms on the other.**
$5a - 12 - 3a = 3a + 7 - 3a$ ←	**To get variables on the same side, subtract 3*a* from each side.**
$2a - 12 = 7$ ←	**Combine like terms.**
$2a - 12 + 12 = 7 + 12$ ←	**To get constants on the other side, add 12 to each side.**
$2a = 19$ ←	**Combine like terms.**
$a = 9.5$ ←	**To undo multiplication by 2, divide each side by 2.**

Check $5(9.5) - 12 \stackrel{?}{=} 3(9.5) + 7$

$47.5 - 12 \stackrel{?}{=} 28.5 + 7$

$35.5 = 35.5$ ✓

In what other ways could you solve for *a*? You could add 12 to each side, then subtract 3*a* from each side. Or, you could subtract 5*a* from each side, then subtract 7 from each side.

Exercises

Fill in the blanks to show a plan to solve each equation.

1. $9x + 4 = 6x - 11$ _____ $6x$ _____ each side; subtract _____ from each side.

2. $4b - 13 = 7b - 28$ Subtract _____from each side; _____ 28 _____ each side.

Use circles and rectangles to mark the variables and constant terms. Write a plan that tells the steps you would use and then solve each equation.

3. $7c - 4 = 9c - 11$

4. $3 - 4d = 6d - 17$

5. $5e + 13 = 7e - 21$

Solve and check each equation.

6. $8f - 12 = 5f + 12$

7. $3k + 5 = 2(k + 1)$

8. $9 - x = 3x + 1$

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