

Name

1/25/12

Algebra Readiness 7

Period #1

Outcome: Solve two-step equations with variables on both sides.

Worksheet: 4.5 Equations with Variables on Both Sides

Substitution

$$\begin{aligned} 1. \quad 8x &= 3 + 5x \\ -5x &\quad -5x \\ 3x &= 3 \\ \div 3 &\quad \div 3 \\ x &= 1 \end{aligned}$$

$$\begin{aligned} 8(1) &= 3 + 5(1) \\ 8 &= 3 + 5 \\ 8 &= 8 \end{aligned}$$

$$\begin{aligned} 2. \quad 6a - 2 &= 5a + 10 \\ -5a &\quad -5a \\ a - 2 &= 10 \\ +2 &\quad +2 \\ a &= 12 \end{aligned}$$

$$\begin{aligned} 6(12) - 2 &= 5(12) + 10 \\ 72 - 2 &= 60 + 10 \\ 70 &= 70 \end{aligned}$$

$$\begin{aligned} 3. \quad 14 + 13k &= -6 + 3k \\ \quad -3k &\quad -3k \\ 14 + 10k &= -6 \\ -14 &\quad -14 \\ 10k &= -20 \\ \div 10 &\quad \div 10 \\ K &= -2 \end{aligned}$$

$$\begin{aligned} 14 + \underline{13(-2)} &= -6 + \underline{3(-2)} \\ 14 + (-26) &= -6 + (-6) \\ -12 &= -12 \end{aligned}$$

$$4. \quad 2(s - 9) = s + 2$$

$$2(s + -9) = s + 2$$

$$2s + -18 = s + 2$$

$$-s \quad -s$$

$$s + -18 = 2$$

$$-(-18) \quad -(-18)$$

$$s = 20$$

$$2(20 - 9) = 20 + 2$$

$$2(11) = 22$$

$$22 = 22$$

Homework: "Extra Practice 4.5" Even numbered problems

RETEACHING 4.5 EQUATIONS WITH VARIABLES ON BOTH SIDES

Some equations have variables on both sides of the equal sign. To solve such equations, get all of the terms containing variables on the same side of the equation. Then combine like terms and solve.

Example 1

Solve $5x - 3 = 3x - 4$.

Solution

$5x - 3 = 3x - 4$	Given
$(5x - 3x) - 3 = (3x - 3x) - 4$	Subtraction Property of Equality
$2x - 3 = -4$	Simplify
$2x - 3 + 3 = -4 + 3$	Addition Property of Equality
$2x = -1$	Simplify
$\frac{2x}{2} = \frac{-1}{2}$	Division Property of Equality
$x = -\frac{1}{2}$	Simplify

Example 2

Solve $4(z + 2) = z - 4$.

Solution

$4(z + 2) = z - 4$	Given
$4z + 8 = z - 4$	Distributive Property
$(4z - z) + 8 = (z - z) - 4$	Subtraction Property of Equality
$3z + 8 = -4$	Simplify
$3z + 8 - 8 = -4 - 8$	Subtraction Property of Equality
$3z = -12$	Simplify
$\frac{3z}{3} = \frac{-12}{3}$	Division Property of Equality
$z = -4$	Simplify

EXERCISES

Solve each equation. Show each step.

1. $8x = 3 + 5x$ _____

2. $6a - 2 = 5a + 10$ _____

3. $14 + 13k = -6 + 3k$ _____

4. $2(s - 9) = s + 2$ _____

**EXTRA PRACTICE 4.5 EQUATIONS WITH
VARIABLES ON BOTH
SIDES**

Solve each equation.

1. $4y = 45 - y$ _____

2. $7q + 2 = 3q - 10$ _____

3. $3a + 12 = 4a$ _____

4. $6w = w + 9.5$ _____

5. $9p + 15 = 16p$ _____

6. $4.2t + 5 = 3.6t - 4$ _____

7. $7x + 4 = 8x + 6 + x$ _____

8. $3m + 2m + 8 = 2(m + 4)$ _____

9. $2.5(b + 3) = -2(b - 3)$ _____

10. $4x - (x + 10) = -2(1 - x)$ _____

11. $c - (3 - c) + 2c = 3c + 3$ _____

12. $6(2r - 1) = 3r - 2(r + 2)$ _____

13. $1.2(2d + 2) = 4.8 - (0.6d + 3)$ _____

14. $8 - (r + 3) - 2r = 4r - 5$ _____

For Exercises 15 and 16, define a variable, write an equation, and solve.

15. Luanne and Lamont are comparing the money they save. Luanne started with \$100 and saves \$5 a month. Lamont started with \$80 and saves \$10 a month. How many months will it be before Luanne and Lamont have saved the same amount of money?

16. Rafael and Lei are riding their bicycles. Rafael has traveled 2 miles and is covering 5 miles each hour. Lei has traveled 1 mile and is covering 7 miles each hour. If they continue at these rates, in how many hours will Rafael and Lei have covered the same distance?
