Name _____ Class _____ Date _____

Reteaching 1-3

Solving Equations

OBJECTIVE: Solving an equation for one of its variables

MATERIALS: None

To solve an equation for one of its variables, rewrite the equation as an equivalent equation with the specified variable on one side of the equation by itself and an expression not containing that variable on the other side.

Example

Solve the equation $\frac{ax - b}{2} = x + 2b$ for x.

Use the properties of equality and the properties of real numbers to rewrite the equation as a sequence of equivalent equations.

$$\frac{ax - b}{2} = x + 2b$$

$2\left(\frac{ax - b}{2}\right) = 2(x + 2b)$ ← **Multiply each side by 2.**

$ax - b = 2(x + 2b)$ ← **Simplify.**

$ax - b = 2x + 4b$ ← **Distributive Property**

$ax - 2x = 4b + b$ ← **Add and subtract to get terms with x on one side and terms without x on the other side.**

$ax - 2x = 5b$ ← **Simplify.**

$x(a - 2) = 5b$ ← **Distributive Property**

$x = \frac{5b}{a - 2}$ ← **Divide each side by $a - 2$.**

The final form of the equation has x on the left side by itself and an expression not containing x on the right side.

Exercises

Solve each equation for the indicated variable.

1. $3m - n = 2m + n$, for m

2. $2(u + 3v) = w - 5u$, for u

3. $ax + b = cx + d$, for x

4. $k(y + 3z) = 4(y - 5)$, for y

5. $\frac{1}{2}r + 3s = 1$, for r

6. $\frac{2}{3}f + \frac{5}{12}g = 1 - fg$, for f

7. $\frac{x + k}{j} = \frac{3}{4}$, for x

8. $\frac{a - 3y}{b} + 4 = a + y$, for y