Unit 1 Solving Equations	Name: Date: Period:
1.3 Solving Equations with Variables on Both Sides	**Essential Question:**

	Core Concept
	Solving Equations with Variables on Both Sides
	To solve an equation with variables on both sides, simplify one or both sides of the equation, if necessary. Then use inverse operations to collect the variable terms on one side, collect the constant terms on the other side, and isolate the variable.

	Concept Summary
	Steps for Solving Linear Equations
	Here are several steps you can use to solve a linear equation. Depending on the equation, you may not need to use some steps.
	Step 1 Use the Distributive Property to remove any grouping symbols.
	Step 2 Simplify the expression on each side of the equation.
	Step 3 Collect the variable terms on one side of the equation and the constant terms on the other side.
	Step 4 Isolate the variable.
	Step 5 Check your solution.

	EXAMPLE 1 **Solving an Equation with Variables on Both Sides**
	Solve $10 - 4x = -9x$. Check your solution.

EXAMPLE 2 **Solving an Equation with Grouping Symbols**

Solve $3(3x - 4) = \frac{1}{4}(32x + 56)$.

Core Concept

Special Solutions of Linear Equations

Equations do not always have one solution. An equation that is true for all values of the variable is an **identity** and has *infinitely many solutions*. An equation that is not true for any value of the variable has *no solution*.

EXAMPLE 3 **Identifying the Number of Solutions**

Solve each equation.

a. $3(5x + 2) = 15x$

b. $-2(4y + 1) = -8y - 2$

EXAMPLE 4 **Modeling with Mathematics**

A boat leaves New Orleans and travels upstream on the Mississippi River for 4 hours. The return trip takes only 2.8 hours because the boat travels 3 miles per hour faster downstream due to the current. How far does the boat travel upstream?

1. Understand the Problem.

2. Make a Plan

3. Solve the Problem

4. Look Back

Summary: