Name _____

2-4 Solving Equations With Variables on Both Sides

OBJECTIVE: **I can solve equations with variables on both sides to identify equations that are identities or have no solution**

With the person sitting next to you, discuss the problem provided and document your response

The diagram gives information about the populations of two towns. After how many years will the populations be equal? How do you know?

Essential Understanding

Essential Understanding To solve equations with variables on both sides, you can use the properties of equality and inverse operations to write a series of simpler equivalent equations.

Example

#1 Solving an Equation With Variables on Both Sides

What is the solution of $5x + 2 = 2x + 14$?

Your Turn to Work it Out

1. What is the solution of $7k + 2 = 4k - 10$?

Example #2 Using an Equation With Variables on Both Sides

Graphic Design It takes a graphic designer 1.5 h to make one page of a Web site. Using new software, the designer could complete each page in 1.25 h, but it takes 8 h to learn the software. How many Web pages would the designer have to make in order to save time using the new software?

Your Turn to Work it Out

2. An office manager spent $650 on a new energy-saving copier that will reduce the monthly electric bill for the office from $112 to $88. In how many months will the copier pay for itself?

Example

#3 Solving an Equation With Grouping Symbols

What is the solution of $2(5x - 1) = 3(x + 11)$?

Your Turn to Work it Out

3. What is the solution of the equation?

$4(2y + 1) = 2(y - 13)$

Example

#4 Identities and Equations With No Solution

What is the solution of each equation?

A $10x + 12 = 2(5x + 6)$

B $9m - 4 = -3m + 5 + 12m$

Your Turn to Work it Out

4. What is the solution of each equation?

$3(4b - 2) = -6 - 12b$