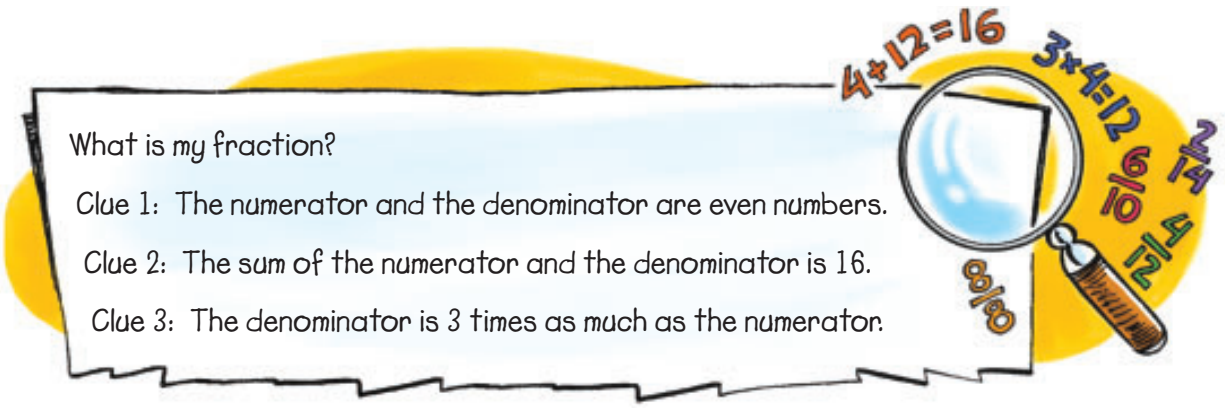
Chapter 7
Lesson 8

# Solving Problems Using Logical Reasoning

**GOAL**

**Use logical reasoning to solve fraction and decimal problems.**

Matthew gave Lauren the following fraction riddle to solve.




**What is Matthew's fraction?**

## Lauren's Solution

### Understand

I need to think of a fraction that matches all the clues.

### Make a Plan

First, I'll list fractions that match the first 2 clues.
Then I'll use the last clue to solve the riddle.

### Carry Out the Plan

Clue 1 says that the numerator and the denominator are even. There are too many possibilities. I need to look at the next clue.

Clue 2 says that the sum of the numerator and the denominator is 16. I can only list even numerators and denominators because of Clue 1. Some fractions that match Clue 1 and Clue 2 are $\frac{2}{14}$, $\frac{4}{12}$, $\frac{6}{10}$, and $\frac{8}{8}$.

Clue 3 says that the denominator of the fraction has to be 3 times as much as the numerator.

Matthew's fraction is $\frac{4}{12}$, since 12 is 3 times as much as 4.

## Reflecting

**A.** How did Lauren use logical reasoning to solve the problem?

Clue 1: A decimal hundredth is between $\frac{1}{2}$ and 0.8.
Clue 2: The number of tenths is an odd number.
Clue 3: The number of hundredths is 5.

## Checking

**1.** Use Lauren's method to figure out the decimals that match the clues at the left.

## Practising

**2.** Use the clues below to determine which coins Indra has. Show all the possibilities.

Clue 1: Indra has 12 coins, including dimes, quarters, and dollars.
Clue 2: Less than $\frac{1}{4}$ of the coins are dollars.
Clue 3: More than $\frac{1}{2}$ but fewer than $\frac{3}{4}$ of the coins are quarters.

**3.** An unknown fraction is equivalent to $\frac{1}{2}$. The sum of its numerator and denominator is 48. What is the fraction?

**4.** Create a fraction or decimal problem that you can solve using clues. Trade problems with a partner, and solve each other's problems.