EXAMPLE 4 TAKS REASONING: Multi-Step Problem

PAINT MIXING You have an 8 pint mixture of paint that is made up of equal amounts of yellow paint and blue paint. To create a certain shade of green, you need a paint mixture that is 80% yellow. How many pints of yellow paint do you need to add to the mixture?

ANOTHER WAY
For an alternative method for solving the problem in Example 4, turn to page 827 for the **Problem Solving Workshop**.

Solution

Because the amount of yellow paint equals the amount of blue paint, the mixture has 4 pints of yellow paint. Let p represent the number of pints of yellow paint that you need to add.

STEP 1 **Write** a verbal model. Then write an equation.

$$\frac{\text{Pints of yellow paint in mixture} + \text{Pints of yellow paint needed}}{\text{Pints of paint in mixture} + \text{Pints of yellow paint needed}} = \text{Desired percent yellow in mixture}$$

$$\frac{4 + p}{8 + p} = 0.8$$

STEP 2 **Solve** the equation.

$\frac{4 + p}{8 + p} = 0.8$ — Write equation.

$4 + p = 0.8(8 + p)$ — Cross products property

$4 + p = 6.4 + 0.8p$ — Distributive property

$0.2p = 2.4$ — Rewrite equation.

$p = 12$ — Solve for p.

▶ You need to add 12 pints of yellow paint.

CHECK

$\frac{4 + p}{8 + p} = 0.8$ — Write original equation.

$\frac{4 + 12}{8 + 12} \stackrel{?}{=} 0.8$ — Substitute 12 for p.

$\frac{16}{20} \stackrel{?}{=} 0.8$ — Simplify numerator and denominator.

$0.8 = 0.8$ ✓ — Write fraction as decimal. Solution checks.

GUIDED PRACTICE for Examples 2, 3, and 4

Solve the equation. Check your solution.

3. $\frac{a}{a + 4} + \frac{1}{3} = \frac{-12}{a + 4}$

4. $\frac{n}{n - 11} - 1 = \frac{22}{n^2 - 5n - 66}$

5. WHAT IF? In Example 4, suppose you need a paint mixture that is 75% yellow. How many pints of yellow paint do you need to add to the mixture?