## **3.2** Solving Equations Having Like Terms and Parentheses

**Goal:** Solve equations using the distributive property.

## **Example 1** Writing and Solving an Equation

**Baseball Game** A group of five friends are going to a baseball game. Tickets for the game cost \$12 each, or \$60 for the group. The group also wants to eat at the game. Hot dogs cost \$2.75 each and bottled water costs \$1.25 each. The group has a total budget of \$85. If the group buys the same number of hot dogs and bottles of water, how many can they afford to buy?

## Solution

Let *n* represent the number of hot dogs and the number of bottles of water. Then 2.75n represents the cost of *n* hot dogs and 1.25n represents the cost of *n* bottles of water. Write a verbal model.



**Answer:** The answer must be a whole number. Round down so the budget is not exceeded. The group can afford to buy hot dogs and bottles of water.





Checkpoint Solve the equation. Check your solution.

<b>1.</b> $-20 = 5(3 - x)$	<b>2.</b> $4y - 14 + 3y = 28$
<b>3.</b> $-3(6-2x) = 12$	4. $5x - 2(x - 3) = 30$

Use after Lesson 3.2

## Solving a Problem Arithmetically and Algebraically

**Goal:** Solve the same problem arithmetically and algebraically.

Example 1 Solving a Problem Arithmetically		
The perimeter of the figure is 42 inches. Find x, the length of 4 of the hexagon's sides. $x$ $y$ in.		
Solution		
The perimeter is the sum of the four sides <i>x</i> plus twice the of the rectangle.		
<b>1.</b> Multiply the length of the rectangle by :		
<b>2.</b> Subtract twice the length of the rectangle from the		
<b>3.</b> The difference found in Step 2 represents the sum of the four		
sides <i>x</i> , so divide this difference by 4 to find :		
$\frac{4}{4} = $		
<b>Answer</b> The length of each side <i>x</i> is .		
Example 2 Solving a Problem Algebraically		
The perimeter of the figure is 42 inches. Find x, the length of 4 of the hexagon's sides.		
Solution		
P=2I+4x	Write a formula for the	
$42 = 2\left( \begin{array}{c} \\ \end{array} \right) + 4x$	Substitute 42 for <i>P</i> and for <i>I</i> .	
$42 = \bigsqcup + 4x$	Multiply.	
= 4x	Subtract from each side and simplify.	
$\frac{\Box}{\Box} = \frac{4x}{\Box}$	Divide each side by	
= x	Simplify.	
<b>Answer:</b> The length of each side <i>x</i> is		