

LESSON  
17Solving Problems with  
Inequalities

## Review It!

To solve problems with inequalities, look for key words.

Mr. Tanner plans to hire a landscape designer. The designer charges \$500 plus \$75 for each hour or part of an hour. How many hours can Mr. Tanner hire the designer if he wants to spend no more than \$2,100?

**Step 1** Look for key words.

"No more than" means "less than or equal to."

**Step 2** Choose a variable.

Let  $h$  = number of hours

**Step 3** Write an inequality.

$$\underline{\hspace{1cm}}h + \underline{\hspace{1cm}}$$

**THINK** This cost changes.

$$\text{The inequality is } 75h + 500 \leq 2,100.$$

**THINK** This cost does not change.

**Step 4** Solve the inequality.

$$75h + 500 \leq 2,100$$

$$75h + 500 - 500 \leq 2,100 - 500$$

**REMEMBER** Subtract the same number from both sides.

$$75h \leq 1,600$$

$$\frac{75h}{75} \leq \frac{1,600}{75}$$

$$h \leq \underline{\hspace{1cm}}$$

**REMEMBER** Divide both sides by the same number.

So, Mr. Tanner can hire the landscape designer for no more than  $\underline{\hspace{1cm}}$  hours.

## Try It!

Write an inequality for each problem.

## Ask Yourself

1. Bob has 28 feet of wire. He needs at least 50 feet for a job. How many feet of wire,  $w$ , must he buy to have enough wire for the job?

1.

What symbol means "at least"?

$\leq$ , or  $\geq$ ?

2. Grace wants to run more than 36 miles each week. This week she has already run 17 miles. How many more miles,  $m$ , should she run this week to meet her goal?

2.

What symbol means "more than"?

$>$ , or  $\geq$ ?

Write and solve an inequality. Answer the question.

3. Nina is having a party. She rented a tent that can seat 144 people. She rented tables that seat 8 people each. What is the GREATEST number of tables,  $t$ , that she can use in the tent?

3.

How many people can sit at  $t$  tables?  $t$ , or  $8t$ ?

4. Sharon needs 500 forks for a party. Forks come in packages of 50. If she already has 150 forks, how many packages,  $p$ , of forks does she need to buy to have enough for the party?

5. Carla's vacation will cost at least \$718. She saves \$85 each week. She already has \$463. How many weeks,  $w$ , does she have to save before she has enough for the vacation?

**On Your Own!**

Circle the best answer for each question.

Use this problem to answer questions 1 and 2.

Filmore saves \$28 each week to buy a video game that costs at least \$140. For how many weeks will he need to save to buy the game?

- Which inequality matches the problem?
  - $28 + w \leq 140$
  - $28 + w \geq 140$
  - $28w \geq 140$
  - $28w \leq 140$
- For how many weeks does Filmore need to save?
  - 4 or more weeks
  - 5 or more weeks
  - 5 or fewer weeks
  - exactly 4 weeks
- Mark needs at least 235 feet of wire. He already has 128 feet. How many more feet must he buy?
  - 80 or more feet
  - 90 or more feet
  - 105 or more feet
  - 107 or more feet

Use this problem to answer questions 4 and 5.

Vicki budgeted \$195 for clothes. She bought shoes for \$54. Jeans cost \$38 each. How many pairs of jeans can she buy and stay within her budget?

- Which inequality matches the problem?
  - $38w - 54 \geq 195$
  - $38w - 54 \leq 195$
  - $38w + 54 \leq 195$
  - $38w + 54 \geq 195$
- How many pairs of pants can she buy?
  - 3 or fewer pairs
  - 4 or fewer pairs
  - 3 or more pairs
  - Exactly 4 pairs
- Tony needs at least 350 buns for a cookout. Buns come in packages of 8. He already has 64 buns. How many packages does he need to buy?
  - 35 or more packages
  - 36 or more packages
  - 35 or fewer packages
  - exactly 35 packages

- Mrs. Damon saved \$500 to rent a car during her vacation. The car rental company charges \$19.50 each day plus \$71. For how many days,  $d$ , can Mrs. Damon rent the car?

**Part A** Write an inequality that you can use to solve the problem.

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**Part B** Solve the inequality.

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**Part C** Answer the question.

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**Math Words**

Fill in the blanks.

- Use the symbol \_\_\_\_\_ if "at most" is in the problem.
- Use the symbol \_\_\_\_\_ if "at least" is in the problem.