LESSON 17

# Solving 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.

$\_\_\_\_h + \_\_\_\_$

THINK This cost changes.

THINK This cost does not change.

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

**Step 4** Solve the inequality.

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

REMEMBER Subtract the same number from both sides.

$75h + 500 - \_\_\_\_ \leq 2{,}100 - \_\_\_\_$

$75h \leq \_\_\_\_$

REMEMBER Divide both sides by the same number.

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

$m \leq \_\_\_\_$

So, Mr. Tanner can hire the landscape designer for no more than ____ 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?

$w + 28 \geq 50$

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?

$m + 17 > 36$

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?

$8t \leq 144$; $T \leq 18$ (18 Tables)

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?

$50p + 150 \geq 500$; $p \geq 7$ (7 more)

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?

$85w + 463 \geq 718$

$w \geq 3$ (3 more)

## 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?

1. Which inequality matches the problem?

   A. $28 + w \leq 140$
   B. $28 + w \geq 140$
   C. $28w \geq 140$
   D. $28w \leq 140$

2. For how many weeks does Filmore need to save?

   A. 4 or more weeks
   B. 5 or more weeks
   C. 5 or fewer weeks
   D. exactly 4 weeks

3. Mark needs at least 235 feet of wire. He already has 128 feet. How many more feet must he buy?

   A. 80 or more feet
   B. 90 or more feet
   C. 105 or more feet
   D. 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?

4. Which inequality matches the problem?

   A. $38w - 54 \geq 195$
   B. $38w - 54 \leq 195$
   C. $38w + 54 \leq 195$
   D. $38w + 54 \geq 195$

5. How many pairs of pants can she buy?

   A. 3 or fewer pairs
   B. 4 or fewer pairs
   C. 3 or more pairs
   D. Exactly 4 pairs

6. 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?

   A. 35 or more packages
   B. 36 or more packages
   C. 35 or fewer packages
   D. exactly 35 packages





7. 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.

   **Part B** Solve the inequality.

   **Part C** Answer the question.

   At most 22 days

**Math Words** Fill in the blanks.

8. Use the symbol ____ if "at most" is in the problem.

9. Use the symbol ____ if "at least" is in the problem.