

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.

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.

$$75h \leq 1,600$$

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

$$h \leq 21\frac{1}{3}$$

REMEMBER Divide both sides by the same number.

So, Mr. Tanner can hire the landscape designer for no more than _____ hours.

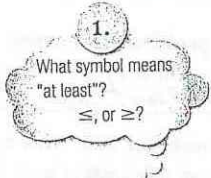
Try It!

Write an inequality for each problem.



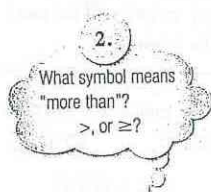
1. Bob has 28 feet of wire. He needs at least 50 feet for a job. How many feet of wire, w , must he buy to have enough wire for the job?

$$w + 28 \geq 50$$



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?

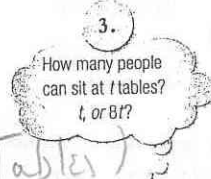
$$m + 17 > 36$$



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?

$$8t \leq 144; t \leq 18 \text{ (18 tables)}$$



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?

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

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?

$$85w + 463 \geq 718$$

$$w \geq 3 \text{ (3 more)}$$

Algebra

On Your Own!

Circle the best answer for each question.

Use this problem to answer questions 1 and 2.

 $\text{least} \Rightarrow \geq$

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? $28w \geq 140$
- 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? $w \geq 5$
- 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? $x + 128 \geq 235$
- 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? $54 + 38w \leq 195$
- 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? $x \leq 3.7$
- 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.

$$19.50d + 71 \leq 500$$

$$19.50d \leq 429$$

$$d \leq 22$$

Part B Solve the inequality.

Part C Answer the question.

At least most, 22 days**Math Words**

Fill in the blanks.

8. Use the symbol \leq if "at most" is in the problem.
9. Use the symbol \geq if "at least" is in the problem.