

## Lesson 15: Graphing Solutions to Inequalities

### Exercise 1

1. Two identical cars need to fit into a small garage. The opening is 23 feet 6 inches wide, and there must be at least 3 feet 6 inches of clearance between the cars and between the edges of the garage. How wide can the cars be?

### Example 1

A local car dealership is trying to sell all of the cars that are on the lot. Currently, it has 525 cars on the lot, and the general manager estimates that they will consistently sell 50 cars per week. Estimate how many weeks it will take for the number of cars on the lot to be less than 75.

Write an inequality that can be used to find the number of  $w$  full weeks. Since  $w$  is the number of full or complete weeks, when  $w = 1$  means at the end of week 1.

Solve and graph the inequality.

Interpret the solution in the context of the problem.

Verify the solution.

**Exercise 2**

2. The cost of renting a car is \$25 per day plus a one time fee of \$75.50 for insurance. How many days can the car be rented if the total cost is to be no more than \$525?
  - a. Write an inequality to model the situation.
  - b. Solve and graph the inequality.
  - c. Interpret the solution in the context of the problem.

**Additional Exercises**

For each problem, write, solve, and graph the inequality, and interpret the solution within the context of the problem.

3. Mrs. Smith decides to buy three sweaters and a pair of jeans. She has \$120 in her wallet. If the price of the jeans is \$35, what is the highest possible price of a sweater?

- The members of the Select Chorus agree to buy at least 250 tickets for an outside concert. They buy 80 less lawn tickets than balcony tickets. What is the least number of balcony tickets bought?
- Samuel needs \$29 to download some songs and movies on his iPod. His mother agrees to pay him \$6 an hour for raking leaves in addition to his \$5 weekly allowance. What is the minimum number of hours Samuel must work in one week to have enough money to purchase the songs and movies?

**Problem Set**

1. Ben has agreed to play less video games and spend more time studying. He has agreed to play less than 10 hours of video games each week. On Monday through Thursday, he plays video games for a total of  $5\frac{1}{2}$  hours. For the remaining 3 days, he plays video games for the same amount of time each day. Find  $t$ , the amount of time he plays video games, for each of the 3 days. Graph your solution.
2. Gary's contract states that he must work more than 20 hours per week. The graph below represents the number of hours he can work in a week.
  - a. Write an algebraic inequality that representing the number of hours,  $h$ , Gary can work in a week.
  - b. Gary gets paid \$15.50 per hour in addition to a weekly salary of \$50. This week he wants to earn more than \$400. Write an inequality to represent this situation.
  - c. Solve and graph the solution from part (b).
3. A bank account has \$650 in it. Every week, Sally withdraws \$50 to pay for her dog sitter. What is the maximum number of weeks that Sally can withdraw the money so there is at least \$75 remaining in the account? Write and solve an inequality to find the solution and graph the solution on a number line.
4. On a cruise ship, there are two options for an internet connection. The first option is a fee of \$5 plus an additional \$0.25 per minute. The second option \$50 for an unlimited number of minutes. For how many minutes,  $m$ , is the first option cheaper than the second option? Graph the solution.