

## Lesson 15: Graphing Solutions to Inequalities

### Classwork

#### Exercise 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

A local car dealership is trying to sell all of the cars that are on the lot. Currently, there are 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 full weeks,  $w$ , that it will take for the number of cars to be less than 75. Since  $w$  is the number of full or complete weeks,  $w = 1$  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.



5. 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 fewer 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 represents the number of hours,  $h$ , Gary can work in a week.
  - b. Gary is 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). Round to the nearest hour.
3. Sally's 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 costs \$50 for an unlimited number of minutes. For how many minutes,  $m$ , is the first option cheaper than the second option? Graph the solution.
5. The length of a rectangle is 100 centimeters, and its perimeter is greater than 400 centimeters. Henry writes an inequality and graphs the solution below to find the width of the rectangle. Is he correct? If yes, write and solve the inequality to represent the problem and graph. If no, explain the error(s) Henry made.

