Real–Life Application: When Will I Ever Use This?

For use with pages 108–113

Lesson 2.6

Playing Computer Games

Some of the more popular computer games are called simulations. They generally take a real-life situation and reproduce it in an exciting and entertaining way.

Suppose you are playing a game that simulates the workings of an ancient tribe of people. These people have to support their village by obtaining food from the wild. Since they are rather primitive, they only know of two ways of getting food: hunting and gathering. You are going to use your knowledge of linear inequalities to direct your people in the most efficient way to gather food.

Suppose your tribe of people has ten people designated to gather food, with the following conditions.

- Each one of them can gather food for up to twelve hours a day.
- Each hour hunting will yield six units of food, while each hour gathering will yield four.
- Tribal customs require that for each hour hunting, at least two hours must be spent gathering.

Answer the following questions to optimize the amount of food that your people can gather.

1. How many hours total can the tribe devote to obtaining food each day?

2. Let *x* represent hours spent hunting and *y* represent hours spent gathering. Write an inequality to represent how these quantities relate to the total number of hours spent obtaining food.

3. Write an inequality using *x* and *y* to represent the restriction due to tribal customs.

4. Knowing that each hour hunting will yield six units of food, while each hour gathering will yield four, write an expression using *x* and *y* to represent how much food is collected.

5. Graph the inequalities from Exercises 2 and 3. Also, graph the inequalities $x \geq 0$ and $y \geq 0$ (because these variables can't be less than zero—you cannot work negative hours!). Shade in the areas that *all* the inequalities share. Your shaded area should look like a polygon.

6. Pick four ordered pairs inside the region you have just shaded, and evaluate them in the expression you found in Exercise 4. Which pair yields the most food?

7. Compare your answers with others in the class, and see who has the best scheme for gathering food.