

# Word Problem on Systems of Linear Equations: Problem Type 2

## • Example 1

A manufacturer produces a standard model and a deluxe model of a 13-inch (in.) television set. The standard model requires 12 h of labor to produce, while the deluxe model requires 18 h. The company has 360 h of labor available per week. The plant's capacity is a total of 25 sets per week. If all the available time and capacity are to be used, how many of each type of set should be produced?

The unknowns in this case are the number of standard and deluxe models that can be produced.

Let  $x$  be the number of standard models and  $y$  the number of deluxe models.

Our system will come from the two given conditions that fix the total number of sets that can be produced and the total labor hours available.

$$x + y = 25$$

$$12x + 18y = 360$$

Solving the system we have

$$x = 15 \quad \text{and} \quad y = 10$$

which tells us that to use all the available capacity, the plant should produce 15 standard sets and 10 deluxe sets per week.

## ● ● ● CHECK YOURSELF 1

A manufacturer produces standard cassette players and compact disc players. The cassette players require 2 h of electronic assembly and the CDs 3 h. The cassette players require 4 h of case assembly and the CDs 2 h. The company has 120 h of electronic assembly time available per week and 160 h of case assembly time. How many of each type of unit can be produced each week if all available assembly time is to be used?

## ● ● ● CHECK YOURSELF ANSWER

1. 30 cassette players and 20 CDs.

# 2.34 Exercises

Name \_\_\_\_\_

Section \_\_\_\_\_

Date \_\_\_\_\_

## A N S W E R S

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

Solve each word problem.

1. **Geometry.** The length of a rectangle is 3 in. less than twice its width. If the perimeter of the rectangle is 84 in., find the dimensions of the rectangle.

2. **Geometry.** The length of a rectangle is 5 cm more than 3 times its width. If the perimeter of the rectangle is 74 cm, find the dimensions of the rectangle.

3. **Mixture Problem.** The cost of an order for 10 computer disks and 3 packages of paper was \$22.50. The next order was for 30 disks and 5 packages of paper, and its cost was \$53.50. Find the price of a single disk and a single package of paper.

4. **Mixture Problem.** A coffee retailer has two grades of decaffeinated beans—one selling for \$4 per pound and the other for \$6.50 per pound. She wishes to blend the beans to form a 150-lb mixture that will sell for \$4.75 per pound. How many pounds of each grade of bean should be used in the mixture?