

## EXTRA PRACTICE 22

### Solving Applications: Systems of Two Equations

Use after Section 8.3

Name \_\_\_\_\_

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Example: The campus bookstore sells two kinds of sweatshirts. The hooded ones sell for \$39.50 and the crewneck ones sell for \$34.50. During the first week of school, a total of 250 sweatshirts were sold at a total value of \$9185. How many of each kind were sold?

We let  $x$  represent the number of hooded sweatshirts sold and  $y$  represent the number of crewneck sweatshirts sold.

The total sold was 250, so we have  $x + y = 250$ . The total amount taken in was \$9185, thus we have  $39.50x + 34.50y = 9185$ .

We solve the following system.

$$\begin{array}{rcl} x + y = 250 & & x + y = 250 \\ 39.5x + 34.5y = 9185 & \text{or} & 395x + 345y = 91,850 \text{ (Multiplying by 10)} \end{array}$$

The solution of the system is  $x = 112$  and  $y = 138$ . These values check. Thus 112 hooded sweatshirts and 138 crewneck sweatshirts were sold.

Solve.

1. The sum of two numbers is  $-11$ . Twice the first number minus the second is 32. Find the numbers. \_\_\_\_\_
2. Two investments are made totaling \$16,000. For a certain year these investments yield \$970 in simple interest. Part of the \$16,000 is invested at 5% and the rest at 7%. How much is invested at 7%? \_\_\_\_\_
3. A collection of nickels and dimes is worth \$3.30. There are 42 coins in all. How many of each kind of coin are there? \_\_\_\_\_
4. Patrick is 4 years younger than his sister Alice. In five years, Patrick will be  $\frac{3}{4}$  as old as Alice. How old is Patrick now? \_\_\_\_\_

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5. The difference between two numbers is 14. Twice the smaller is 7 more than the larger. What are the numbers? \_\_\_\_\_
  
6. The perimeter of a lot is 84 ft. The length exceeds the width by 16 feet. Find the length and the width. \_\_\_\_\_
  
7. One night a theater sold 548 movie tickets. An adult's ticket costs \$6.50, and a child's ticket costs \$3.50. In all, \$2881 was taken in. How many of each kind of ticket were sold?  
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8. A train leaves Smithville and travels south at a speed of 60 mph. Three hours later, a second train leaves on a parallel track and travels south at 90 mph. How far from the station will they meet? \_\_\_\_\_
  
9. The sum of a certain number and a second number is 21. The second number minus the first number is  $-57$ . Find the numbers. \_\_\_\_\_
  
10. The perimeter of a rectangular field is 110 feet. The length is 7 feet more than twice the width. Find the dimensions. \_\_\_\_\_
  
11. A chemist has one solution that is 20% saline and a second that is 65% saline. How many gallons of each should be mixed together to get 120 gallons of a solution that is 50% saline?  
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12. Two investments are made totaling \$23,000. For a certain year these investments yield \$2095 in simple interest. Part of the \$23,000 is invested at 8% and the rest at 11%. How much is invested at each rate? \_\_\_\_\_

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13. Two angles are complementary. One angle is  $10^\circ$  less than three times the other. Find the measures of the angles. \_\_\_\_\_

14. A small boat took 2 hr to make a trip downstream with a 4-mph current. The return trip against the same current took 3 hr. Find the speed of the boat in still water. \_\_\_\_\_