

Accelerated 65-95, HW 4 (B 4.4) Systems of Equations Applications

**Concept and Vocabulary Check:**

1. Suppose that  $x$  represents the cost of one apple and  $y$  represents the cost of one banana. The cost of five apples and six bananas is represented by \_\_\_\_\_.
2. Suppose that  $x$  represents the length of a rectangular lot, in feet, and  $y$  represents its width, in feet. The cost of fencing the entire lot at \$10 per foot for the length and \$15 per foot for the width is represented by \_\_\_\_\_.
3. A solar heating system costs \$25,600 to install and has operating costs of \$225 per year. The total cost for the solar system after  $x$  years is represented by \_\_\_\_\_.
4. The combined yearly interest for  $x$  dollars invested at 4% and  $y$  dollars invested at 5% is represented by \_\_\_\_\_.
5. The total amount of acid in  $x$  milliliters of a 7% acid solution and  $y$  milliliters of a 15% acid solution is represented by \_\_\_\_\_.

**Practice Exercises:**

1. The sum of two numbers is 17. If one number is subtracted from the other, their difference is -3. Find the numbers.
3. Three times a first number decreased by a second number is -1. The first number increased by twice the second number is 23. Find the numbers.

## Applications:

In all of your application problems I expect you to define any variables used and to state an appropriate conclusion using complete sentences and proper grammar.

5. The bar graph on page 330 shows the average time per day that Americans devote to sprucing up. Each day, the sum of the average times spent on grooming for 20- to 24-year-old women and men is 86 minutes. The difference between grooming times for 20- to 24-year-old women and men is 12 minutes. How many minutes per day do 20- to 24-year-old women and men spend on grooming?

7. The graph on page 330 shows the four candy bars with the highest fat content, representing grams of fat and calories in each bar.

One Mr. Goodbar and two Mounds bars contain 780 calories. Two Mr. Goodbars and one Mounds bar contain 786 calories. Find the caloric content of each candy bar.

15. A rectangular lot whose perimeter is 320 feet is fenced along three sides. An expensive fencing along the lot's length costs \$16 per foot. An inexpensive fencing along the two side widths costs only \$5 per foot. The total cost of the fencing along the three sides comes to \$2140. What are the lot's dimensions?
17. You are choosing between two long distance telephone plans. Plan A has a monthly fee of \$20 with a charge of \$0.05 per minute for all long-distance calls. Plan B has a monthly fee of \$5 with a charge of \$0.10 per minute for all long-distance calls.
- For how many minutes of calls will the costs for the two plans be the same? What will be the cost for each plan?
  - If you make approximately 10 calls per month, each averaging 20 minutes, which plan should you select? Explain your answer.

19. You are choosing between two plans at a discount warehouse. Plan A offers an annual membership fee of \$100 and you pay 80% of the manufacturer's recommended list price. Plan B offers an annual membership fee of \$40 and you pay 90% of the manufacturer's recommended list price. How many dollars of merchandise would you have to purchase in a year to pay the same amount under both plans? What will be the cost for each plan, including merchandise?

25. Nutritional information for macaroni and broccoli is given in the table on page 331. How many servings of each would it take to get exactly 14 grams of protein and 48 grams of carbohydrates?

29. You invest \$20,000 in two accounts paying 7% and 8% annual interest. How much should be invested at each rate if the total interest earned for the year is to be \$1520?

33. You invest \$6,000 in two accounts paying 6% and 9% annual interest. At the end of the year, the accounts earn the same interest. How much was invested at each rate?

37. A lab technician needs to mix a 5% fungicide solution with a 10% fungicide solution to obtain a 50-liter mixture consisting of 8% fungicide. How many liters of each solution need to be used?

39. How many ounces of a 15% alcohol solution must be mixed with 4 ounces of a 20% alcohol solution to make a 17% alcohol solution?