NUMBERS PROBLEMS

1. The number is 3 more than twice another. The sum of the numbers is 18. Find the two numbers.

2. The sum of two numbers is 32. One of the numbers is 4 less than 5 times the other. Find the two numbers.

3. The difference of two numbers is 6. Twice the smaller is 4 more than the larger. Find the two numbers.

4. The larger of two numbers is 5 more than twice the smaller. If the smaller is subtracted from the larger result is 12. Find the two numbers.

5. The sum of three numbers is 8. Twice the smallest is 2 less than the largest, while the sum of the largest and smallest is 5. Use a linear system in three variables to find the three numbers.

6. The sum of three numbers is 14. The largest is 4 times the smallest, while the sum of the smallest and twice the largest is 18. Use a linear system in three variables to find the three numbers.

TICKET AND INTEREST PROBLEMS

7. A total of 925 tickets were sold for a game for a total of $1,150. If adult tickets sold for $2.00 and children’s tickets sold for $1.00, how many of each kind of ticket were sold?

8. If tickets for a show cost $2.00 for adults and $1.50 for children, how many of each kind of ticket were sold if a total of 300 tickets were sold for $525?

9. Mr. Jones has $20,000 to invest. He invests part at 6% and the rest at 7%. If he earns $1,280 in interest after one year, how much did he invest at each rate?

10. A man invests $17,000 in two accounts. One account earns 5% interest per year and the other 6.5%. If his total interest after one year is $970, how much did he invest at each rate?

11. Susan invests twice as much money at 7.5% as she does at 6%. If her total interest after a year is $840, how much does she have invested at each rate?

12. A woman earns $1,350 in interest from two accounts in a year. If she has three times as much invested at 7% as she does at 6%, how much does she have in each account?

13. A man invests $2,200 in three accounts that pay 6%, 8%, and 9% in annual interest, respectively. He has three times as much invested at 9% as he does at 6%. If his total interest for the year is $178, how much is invested at each rate?

14. A student has money in three accounts that pay 5%, 7%, and 8% in annual interest. She has three times as much invested at 8% as she does at 5%. If the total amount she has invested is $1,600 and her interest for the year comes to $115, how much money does she have in each account?
MIXTURE PROBLEMS

15. How many gallons of 20% alcohol solution and 50% alcohol solution must be mixed to get 9 gallons of 30% alcohol solution?

16. How many ounces of 30% hydrochloric acid solution and 80% hydrochloric acid solution must be mixed to get 10 ounces of 50% hydrochloric acid solution?

17. A mixture of 16% disinfectant solution is to be made from 20% and 14% disinfectant solutions. How much of each solution should be used if 15 gallons of the 16% solution are needed?

18. How much 25% antifreeze and 50% antifreeze should be combined to give 40 gallons of 30% antifreeze?

RATE PROBLEMS

19. It takes a boat 2 hours to travel 24 miles downstream and 3 hours to travel 18 miles upstream. What is the speed of the boat in still water? What is the speed of the current of the river?

20. A boat on a river travels 20 miles downstream in only 2 hours. It takes the same boat 6 hours to travel 12 miles upstream. What are the speed of the boat and the speed of the current?

21. An airplane flying with the wind can cover a certain distance in 2 hours. The return trip against the wind takes 2 and half hours. How fast is the plane and what is the speed of the air, if the distance is 600 miles?

22. An airplane covers a distance of 1,500 miles in 3 hours when it flies with the wind and 3 and 1/3 hours when it flies against the wind. What is the speed of the plane in still air?

COIN PROBLEMS

23. Bob has 20 coins totaling $1.40. If he has only dimes and nickels, how many of each coin does he have?

24. If Amy has 15 coins totaling $2.70, and the coins are quarters and dimes, how many of each coin does she have?

25. A collection of nickels, dimes, and quarters consists of 9 coins with a total value of $1.20. If the number of dimes is equal to the number of nickels, find the number of each type of coin.

26. A coin collection consists of 12 coins with total value of $1.20. If the collection consists only of nickels, dimes, and quarters, and the number of dimes is two more than twice the number of nickels, how many of each type of coin are in the collection?
27. A manufacturing company finds that they can sell 300 items if the price per item is $2.00, and 400 items if the price is $1.50 per item. If the relationship between the number of items sold \( X \) and price per item \( p \) is a linear one, find a formula that gives \( X \) in terms of \( p \). Then use the formula to find the number of items they will sell if the price per item is $3.00.

28. A company manufactures and sells bracelets. They have found from past experience that they can sell 300 bracelets each week if the price per bracelet is $2.00, but only 150 bracelets are sold if the price is $2.50 per bracelet. If the relationship between the number of bracelets sold \( X \) and the price per bracelet \( p \) is a linear one, find a formula that gives \( X \) in terms of \( p \). Then use the formula to find the number of bracelets they will sell at $3.00 each.

29. Five Cities Garbage charges a flat monthly fee for their services plus a certain amount for each bag of trash they pick up. A customer notices that the January bill for picking up 5 bags of trash was $25.60, while the February bill for 7 bags of trash was $27.10. Assume the relationship between the total monthly charges \( C \) and the number of bags of trash picked up \( x \) is a linear relationship. Use the data to find the formula that gives \( C \) in terms of \( x \). Then use the formula to predict the cost for picking up 12 bags of trash in one month.

30. A bottled water company charges a flat fee each month for the use of their water dispenser plus a certain amount for each gallon of water delivered. Suppose that the company delivers 10 gallons of water in March and the March bill is $18. Then, in April, 15 gallons of water are delivered for a total charges of $23.50. Assume the relationship between the total monthly charges \( C \) and the number of gallons of water delivered \( x \) is a linear relationship. Use the data to find the formula that gives \( C \) in terms of \( x \). Then use the formula to predict the cost if 20 gallons of water are delivered in one month.