Chapter 2: More Practice

For each of the following, use the simple interest formula $i = prt$.

1. Joe loans his brother $2,000 for 4 years at a simple interest rate of 4% per year. At the end of the 4 years, how much does his brother owe?

2. Suppose Joe would like to make $600 in interest by loaning his brother $2,000 for 4 years. What interest rate should he charge?

3. Maria borrowed $500 from her parents at a simple interest rate of 4.5%. At the end of the loan period, she repaid them $556.25. Determine the length of the loan.

For each of the following, use the compound interest formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$. You will need a calculator.

4. Suppose you purchase a $2,000 3-month CD with an interest rate of 2.35%. If you let the interest compound for 4 years, what will be the balance of the CD?

5. If you deposit $50 in a savings account when you were 10 years old, yielding 1.5% interest, what would the balance of the account be today? (Note: Savings accounts are compounded monthly.)

6. Suppose you take $5,000 out in school loans at a rate of 5.5%, and leave the loan to accrue interest for 4 years. What will be the balance of the loan at the end of the four years if interest is compounded monthly?

7. In April of 1803, then President Thomas Jefferson purchased the Louisiana Territory and the citizenship of its residents for 15 million dollars from Napoleon Bonaparte of France. If we assume an annual inflation rate of 2% compounding monthly, what would be the corresponding price today? (Round your answer to the nearest million.)

Translate each of the following phrases into an algebraic expression.

8. 3 more than a number
9. five less than twice a number
10. the total plus a 15% tip
11. the number of cents in d dimes
12. the number of dollars from q quarters
13. a 6% tax on a sale of d dollars
14. the total (including tax) on a sale of d dollars with 6% tax

Translate each of the following phrases into an algebraic equation.

15. The sum of two numbers is ten.
16. The length of a rectangle is two more than twice the width.
17. The width of a rectangle is 8 feet and the perimeter is 26 feet.
18. The length of a rectangle is three feet less than the width, and the perimeter is 30 feet.
19. Two angles are complementary, and one angle is three times the size of the other.
20. The sum of three consecutive integers is 18.

Answer each of the following questions.

21. If the sum of two numbers is 10, find an expression for each number.

22. If $10,000 is shared by two people, and the first person has x dollars, how much does the 2nd person have?
23. If a 15-ft board is cut into two pieces, and then length of the first piece is x feet, how long is the second piece?

In each example, translate the given information into an algebraic equation.

24. Ron runs a ski train. One day he noticed that the train contained 13 more women than men (including himself). If there were a total of 165 people on the train, how many of them were men?

25. A piece of rope 130 cm long is cut into three pieces. The longest piece is 6 cm less than 3 times as long as the shortest piece, and the middle-sized piece is 26 cm longer than the shortest piece. Find the lengths of the three pieces.

26. Find the length of a rectangular garden if its perimeter is 96 feet and its width is 12 feet.

27. An advertisement for a DVD player gives a sale price of $175.50. The regular price is $225. Find the percent discount on this DVD player.

28. Suppose you can afford to spend $50 on some new clothes. If sales tax in Elgin is 6.5%, what is the most expensive item you can purchase?

29. A restaurant bill came to $91.80, including an 8% sales tax. What was the bill for food without tax?

30. AT&T has a long-distance plan which costs $29.95 per month for unlimited long distance calls. A different plan costs $3.95 and 7¢ per minute. After how many minutes will the plans be the same cost?

31. Metra has several options for purchasing tickets. One option is that tickets can be purchased individually – a ride from Elgin to Chicago's Union Station costs $4.90 each way. Another option is a monthly pass, which costs $132.30. How many daily rides must a person make for the cost to be the same as a monthly pass?

32. A set of walkie-talkies has a range of about 2 miles. Suppose Donna and Alice begin walking along a nature trail heading in opposite directions carrying their walkie-talkies. If Donna walks at a rate of 3.5 mph and Alice walks at a rate of 4.5 mph, how long will it take for them to be out of the range of the walkie-talkies?

33. Hal works two part-time jobs. One job pays $7.00 an hour and the other pays $7.75 an hour. Las week Hal earned a total of $190.25 and worked a total of 26 hours. How many hours did Hal work at each job?

34. Oberweis Dairy has 400 quarts of whole milk containing 5% butterfat. How many quarts of low-fat milk containing 1.5% butterfat should be added to produce milk containing 2% butterfat?