Number Problems

1. The sum of a number and five is thirteen. Find the number.
2. The difference of ten and a number is negative eight. Find the number.
3. The sum of twice a number and four is fourteen. Find the number.
4. The difference of four times a number and eight is sixteen. Find the number.
5. Five times the sum of a number and seven is thirty. Find the number.
6. Five times the difference of twice a number and six is negative twenty. Find the number.
7. One number is two more than another. Their sum is eight. Find both numbers.
8. One number is three less than another. Their sum is fifteen. Find the numbers.
9. One number is four less than three times another. If their sum is increased by five, the result is twenty-five. Find the numbers.

Age Problems

11. Shelly is 3 years older than Michele. Four years ago the sum of their ages was 67. Find the age of each person now.

\[
\begin{array}{c|cc}
\text{Four Years Ago} & \text{Now} \\
Shelly & x - 1 & x + 3 \\
Michele & x - 4 & x
\end{array}
\]

12. Cary is 9 years older than Dan. In 7 years the sum of their ages will be 93. Find the age of each man now.

\[
\begin{array}{c|cc}
\text{Now} & \text{In Seven Years} \\
Cary & x + 9 & x + 16 \\
Dan & x & x + 7
\end{array}
\]

Perimeter Problems

21. The perimeter of a square is 36 inches. Find the length of one side.
22. The perimeter of a square is 44 centimeters. Find the length of one side.
23. The perimeter of a square is 60 feet. Find the length of one side.
24. The perimeter of a square is 84 meters. Find the length of one side.
25. One side of a triangle is three times the shortest side. The third side is 7 feet more than the shortest side. The perimeter is 62 feet. Find all three sides.
26. One side of a triangle is half the longest side. The third side is 10 meters less than the longest side. The perimeter is 45 meters. Find all three sides.
27. One side of a triangle is half the longest side. The third side is 12 feet less than the longest side. The perimeter is 53 feet. Find all three sides.
28. One side of a triangle is 6 meters more than twice the shortest side. The third side is 9 meters more than the shortest side. The perimeter is 75 meters. Find all three sides.
16. Tim is 5 years older than JoAnn. Six years from now the sum of their ages will be 79. How old are they now?

<table>
<thead>
<tr>
<th></th>
<th>Now</th>
<th>Six Years From Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tim</td>
<td>x + 5</td>
<td>x + 11</td>
</tr>
<tr>
<td>JoAnn</td>
<td>x</td>
<td>x + 6</td>
</tr>
</tbody>
</table>

17. Jack is twice as old as Lacy. In 3 years the sum of their ages will be 54. How old are they now?

18. John is 4 times as old as Martha. Five years ago the sum of their ages was 50. How old are they now?

19. Pat is 20 years older than his son Patrick. In 2 years Pat will be twice as old as Patrick. How old are they now?

20. Diane is 23 years older than her daughter Amy. In 6 years Diane will be twice as old as Amy. How old are they now?

28. One side of a triangle is 6 meters more than twice the shortest side. The third side is 9 meters more than the shortest side. The perimeter is 75 meters. Find all three sides.

29. The length of a rectangle is 5 inches more than the width. The perimeter is 34 inches. Find the length and width.

30. The width of a rectangle is 3 feet less than the length. The perimeter is 10 feet. Find the length and width.

31. The length of a rectangle is 7 inches more than twice the width. The perimeter is 68 inches. Find the length and width.

32. The length of a rectangle is 4 inches more than three times the width. The perimeter is 72 inches. Find the length and width.

33. The length of a rectangle is 6 feet more than three times the width. The perimeter is 36 feet. Find the length and width.

34. The length of a rectangle is 3 feet less than twice the width. The perimeter is 54 feet. Find the length and width.

**Coin Problems**

35. Martha has $4.40 in quarters and dimes. If she has 5 more quarters than dimes, how many of each coin does she have?

<table>
<thead>
<tr>
<th>Dimes</th>
<th>Quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>x</td>
</tr>
<tr>
<td>Value (cents)</td>
<td>10x</td>
</tr>
</tbody>
</table>

36. Kendra has $2.75 in dimes and nickels. If she has twice as many dimes as nickels, how many of each coin does she have?

<table>
<thead>
<tr>
<th>Nickels</th>
<th>Dimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>x</td>
</tr>
<tr>
<td>Value (cents)</td>
<td>5x</td>
</tr>
</tbody>
</table>

37. Tanner has $4.35 in nickels and quarters. If he has 15 more nickels than quarters, how many of each coin does he have?

<table>
<thead>
<tr>
<th>Nickels</th>
<th>Dimes</th>
<th>Quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>x + 3</td>
<td>x</td>
</tr>
<tr>
<td>Value</td>
<td>5(x + 3)</td>
<td>x</td>
</tr>
</tbody>
</table>

38. Mike has $1.55 in dimes and nickels. If he has 7 more nickels than dimes, how many of each coin does he have?

39. Katie has a collection of nickels, dimes, and quarters with a total value of $4.35. There are 3 more dimes than nickels and 5 more quarters than nickels. How many of each coin is in her collection?

40. Mary Jo has $3.90 worth of nickels, dimes, and quarters. The number of nickels is 3 more than the number of dimes. The number of quarters is 7 more than the number of dimes. How many of each coin is in her collection?
43. Cory has a collection of nickels, dimes, and quarters with a total value of $2.55. There are 6 more dimes than nickels and twice as many quarters as nickels. How many of each coin is in her collection?

<table>
<thead>
<tr>
<th>Nickels</th>
<th>Dimes</th>
<th>Quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>$x$</td>
<td>$x + 15$</td>
</tr>
<tr>
<td>Value (cents)</td>
<td>$5(x + 15)$</td>
<td>$22x$</td>
</tr>
</tbody>
</table>

44. Kelly has a collection of nickels, dimes, and quarters with a total value of $7.40. There are four more nickels than dimes and twice as many quarters as nickels. How many of each coin is in her collection?

<table>
<thead>
<tr>
<th>Nickels</th>
<th>Dimes</th>
<th>Quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>$x + 4$</td>
<td>$x$</td>
</tr>
<tr>
<td>Value (cents)</td>
<td>$3(x + 4)$</td>
<td>$25[2(x + 4)]$</td>
</tr>
</tbody>
</table>

37. Tanner has $4.35 in nickels and quarters. If he has 15 more nickels than quarters, how many of each coin does he have?

<table>
<thead>
<tr>
<th>Nickels</th>
<th>Quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>$x + 15$</td>
</tr>
<tr>
<td>Value (cents)</td>
<td>$5(x + 15)$</td>
</tr>
</tbody>
</table>

38. Connor has $9.00 in dimes and quarters. If he has twice as many quarters as dimes, how many of each coin does he have?

<table>
<thead>
<tr>
<th>Dimes</th>
<th>Quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>$x$</td>
</tr>
<tr>
<td>Value (cents)</td>
<td>$10x$</td>
</tr>
</tbody>
</table>

39. Sue has $3.10 in dimes and nickels. If she has 9 more dimes than nickels, how many of each coin does she have?

<table>
<thead>
<tr>
<th>Nickels</th>
<th>Dimes</th>
<th>Quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>$x$</td>
<td>$x$</td>
</tr>
<tr>
<td>Value (cents)</td>
<td>$10x$</td>
<td>$25[2(x + 4)]$</td>
</tr>
</tbody>
</table>

---

Triangle Problems

21. Two angles in a triangle are equal and their sum is equal to the third angle in the triangle. What are the measures of each of the three interior angles?

22. One angle in a triangle measures twice the smallest angle, whereas the largest angle is six times the smallest angle. Find the measures of all three angles.

23. The smallest angle in a triangle is $\frac{1}{3}$ as large as the largest angle. The third angle is twice the smallest angle. Find the three angles.

24. One angle in a triangle is half the largest angle but three times the smallest. Find all three angles.
25. A right triangle has one 37° angle. Find the other two angles.

26. In a right triangle, one of the acute angles is twice as large as the other acute angle. Find the measure of the two acute angles.

27. One angle of a triangle measures 20° more than the smallest, while a third angle is twice the smallest. Find the measure of each angle.

28. One angle of a triangle measures 50° more than the smallest, while a third angle is three times the smallest. Find the measure of each angle.

Miscellaneous Problems

29. Ticket Prices: Miguel is selling tickets to a barbecue. Adult tickets cost $6.00 and children’s tickets cost $4.00. He sells six more children’s tickets than adult tickets. The total amount of money he collects is $184. How many adult tickets and how many children’s tickets did he sell?

<table>
<thead>
<tr>
<th>Number</th>
<th>Adult</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>6x</td>
<td>4(x + 6)</td>
</tr>
</tbody>
</table>

30. Working Two Jobs: Maggie has a job working in an office for $10 an hour and another job driving a tractor for $12 an hour. One week she works in the office twice as long as she drives the tractor. Her total income for that week is $416. How many hours did she spend at each job?

<table>
<thead>
<tr>
<th>Job</th>
<th>Office</th>
<th>Tractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours Worked</td>
<td>2x</td>
<td>x</td>
</tr>
<tr>
<td>Wages Earned</td>
<td>10(2x)</td>
<td>12x</td>
</tr>
</tbody>
</table>

31. Phone Bill: The cost of a long-distance phone call is $0.41 for the first minute and $0.32 for each additional minute. If the total charge for a long-distance call is $5.21, how many minutes was the call?

32. Phone Bill: Danny, who is 1 year old, is playing with the telephone when he accidentally presses one of the buttons. His mother has programmed the dialer to dial his friend Sue’s number. Sue answers the phone and realizes Danny is on the other end. She talks to Danny, trying to get him to hang up. The cost for a call is $0.23 for the first minute and $0.14 for every minute after that. If the total charge for the call is $3.33, how long did it take Sue to convince Danny to hang up the phone?

33. Hourly Wages: JoAnn works in the publicity office at the state university. She is paid $12 an hour for the first 35 hours she works each week and $18 an hour for every hour after that. If she makes $492 one week, how many hours did she work?

34. Hourly Wages: Diann has a part-time job that pays her $6.50 an hour. During one week she works 26 hours and is paid $178.10. She realizes when she sees her check that she has been given a raise. How much per hour is that raise?

35. Office Numbers: Professors Wong and Gill have offices in the mathematics building at Miami Dade College. Their office numbers are consecutive odd integers with a sum of 14660. What are the office numbers of these two professors?

36. Cell Phone Numbers: Diana and Tim buy two cell phones. The phone numbers assigned to each are consecutive integers with a sum of 11,100,028. If the smaller number is Diana’s, what are their phone numbers?

37. Age: Marissa and Kendra are 2 years apart in age. Their ages are two consecutive even integers. Kendra is the younger of the two. If Marissa’s age is added to twice Kendra’s age, the result is 26. How old is each girl?

38. Age: Justin’s and Ethan’s ages form two consecutive odd integers. What is the difference of their ages?

39. Arrival Time: Jeff and Carla Cole are driving separately from San Luis Obispo, California, to the north shore of Lake Tahoe, a distance of 425 miles. Jeff leaves San Luis Obispo at 11:00 am and averages 56 miles per hour on the drive. Carla leaves later, at 1:00 pm, but averages 65 miles per hour. Which person arrives in Lake Tahoe first?

40. Piano Lessons: Tyler is taking piano lessons. Because he doesn’t practice as often as his parents would like him to, he has to pay for part of the lessons himself. His parents pay him $0.60 to do the laun-
Chapter 2: Linear Equations and Inequalities

dry and $1.25 to mow the lawn. In one month, he
does the laundry 6 more times than he mows
the lawn. If his parents pay him $15.50 that month,
how many times did he mow the lawn?

At one time, the Texas Junior College Teachers
Association annual conference was held in Austin. At
that time a taxi ride in Austin was $1.25 for the first $5
of a mile and $0.25 for each additional $\frac{1}{2}$ of a mile. Use
this information for Problems 41 and 42.

41. Cost of a Taxi Ride: If the distance from one of
the convention hotels to the airport is 7.5 miles, how
much will it cost to take a taxi from that hotel to
the airport?

42. Cost of a Taxi Ride: Suppose the distance from one
of the hotels to one of the western dance clubs in
Austin is 12.4 miles. If the fare meter in the taxi
gives the charge for that trip as $16.50, is the meter
working correctly?

43. Geometry: The length and width of a rectangle are
consecutive even integers. The perimeter is 44
meters. Find the length and width.

44. Geometry: The length and width of a rectangle are
consecutive odd integers. The perimeter is 128
meters. Find the length and width.

45. Geometry: The angles of a triangle are three
consecutive integers. Find the measure of each angle.

46. Geometry: The angles of a triangle are three
consecutive even integers. Find the measure of each angle.

Dance Lessons: Besides the number of people in the
dance lesson, what additional information does he
need to know to always be sure he is being paid
the correct amount?

Maintaining Your Skills

The problems that follow review some of the more
important skills you have learned in previous sections
and chapters. You can consider the time you spend
working these problems as time spent studying for
exams.

Simplify the expression $36x - 12$ for each of the following values of $x$.

$31. \quad \frac{1}{2} - 3$

$32. \quad \frac{1}{6} - 6$

$33. \quad \frac{1}{9} - 8$

$34. \quad \frac{3}{2} - 42$

$35. \quad \frac{5}{6} - 6$

$36. \quad \frac{5}{12} - 3$

$37. \quad \frac{6}{9} - 8$

$38. \quad \frac{2}{3} - 12$

Find the value of each expression when $x = -4$.

$59. \quad 3(x - 4) - 24$

$60. \quad 3x - 4) - 24$

$61. \quad -5x + 8 - 28$

$62. \quad 5x - 8 - 12$

$63. \quad \frac{x - 14}{36}$

$64. \quad \frac{x - 12}{-4}$

Finding the value of each expression when $x = -4$:

$59. \quad 3(x - 4) - 24$

$60. \quad 3x - 4 - 24$

$61. \quad -5x + 8 - 28$

$62. \quad 5x + 8 - 12$

$63. \quad \frac{x - 14}{36}$

$64. \quad \frac{x - 12}{-4}$

Getting Ready for the Next Section:

To understand all of the explorations in the
textbook, you must be familiar with the concepts below.

Solve the following equations:

$71. \quad x - 3 = 6$

$72. \quad x + 3 = 6$

$73. \quad x - 3 = 6$

$74. \quad x + 3 = 6$