

## 2.4

## Exercises

FOR  
EXTRA  
HELP

MyMathLab

MathXL  
PRACTICE

WATCH

DOWNLOAD

READ

REVIEW

- In your own words, write the general procedure for solving applications as outlined in this section.
- List some of the words that translate as “=” when writing an equation to solve an applied problem.
- Suppose that a problem requires you to find the number of cars on a dealer’s lot. Which one of the following would not be a reasonable answer? Justify your answer.  
A. 0      B. 45      C. 1      D.  $6\frac{1}{2}$
- Suppose that a problem requires you to find the number of hours a light bulb is on during a day. Which one of the following would not be a reasonable answer? Justify your answer.  
A. 0      B. 4.5      C. 13      D. 25
- Suppose that a problem requires you to find the distance traveled in miles. Which one of the following would not be a reasonable answer? Justify your answer.  
A. -10      B. 1.8      C.  $10\frac{1}{2}$       D. 50
- Suppose that a problem requires you to find the time in minutes. Which one of the following would not be a reasonable answer? Justify your answer.  
A. 0      B. 10.5      C. -5      D. 90

Solve each problem. See Example 1.

- The product of 8, and a number increased by 6, is 104. What is the number?
- The product of 5, and 3 more than twice a number, is 85. What is the number?
- Two less than three times a number is equal to 14 more than five times the number. What is the number?
- Nine more than five times a number is equal to 3 less than seven times the number. What is the number?
- If 2 is subtracted from a number and this difference is tripled, the result is 6 more than the number. Find the number.
- If 3 is added to a number and this sum is doubled, the result is 2 more than the number. Find the number.
- The sum of three times a number and 7 more than the number is the same as the difference between -11 and twice the number. What is the number?
- If 4 is added to twice a number and this sum is multiplied by 2, the result is the same as if the number is multiplied by 3 and 4 is added to the product. What is the number?

Solve each problem. See Example 2.

15. The number of drive-in movie screens has declined steadily in the United States. Pennsylvania and Ohio had the most remaining drive-in movie screens in 2007. Pennsylvania had 2 more screens than Ohio, and there were 68 screens total in the two states. How many drive-in movie screens remained in each state? (Source: Drive-Ins.com)

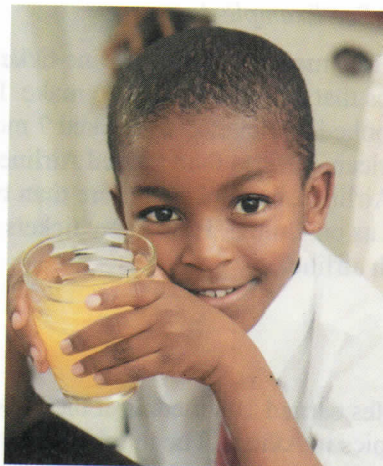


16. Two of the most watched episodes in television were the final episode of *M\*A\*S\*H*, broadcast on February 23, 1983, and the “Who Shot J. R.?” episode of *Dallas*, broadcast on November 21, 1980. The total number of viewers for these two episodes was about 91 million, with 9 million more people watching the *M\*A\*S\*H* episode than the *Dallas* one. How many people watched each show? (Source: Nielsen Media Research.)



17. During the 109th session (2005–2006), the U.S. Senate had a total of 99 Democrats and Republicans. There were 11 more Republicans than Democrats. How many Democrats and Republicans were there in the Senate? (Source: *World Almanac and Book of Facts*.)
18. The total number of Democrats and Republicans in the U.S. House of Representatives during the 109th session was 434. There were 30 more Republicans than Democrats. How many members of each party were there? (Source: *World Almanac and Book of Facts*.)
19. The Police and Kenny Chesney had the two top-grossing North American concert tours in 2007, together generating \$204.3 million in ticket sales. If Kenny Chesney took in \$62.1 million less than The Police, how much did each tour generate? (Source: Pollstar.)
20. The Toyota Camry was the top-selling passenger car in the United States in 2005, followed by the Honda Accord. Honda Accord sales were 65 thousand less than Toyota Camry sales, and 803 thousand of these two cars were sold. How many of each make of car were sold? (Source: [www.wikipedia.org](http://www.wikipedia.org))
21. In the 2006–2007 NBA regular season, the Phoenix Suns won 19 more than twice as many games as they lost. The Suns played 82 games. How many wins and losses did the team have? (Source: [nba.com](http://nba.com))
22. In the 2007 regular baseball season, the Boston Red Sox won 36 less than twice as many games as they lost. They played 162 regular season games. How many wins and losses did the team have? (Source: [www.mlb.com](http://www.mlb.com))

23. A one-cup serving of orange juice contains 3 mg less than four times the amount of vitamin C as a one-cup serving of pineapple juice. Servings of the two juices contain a total of 122 mg of vitamin C. How many milligrams of vitamin C are in a serving of each type of juice? (Source: U.S. Agriculture Department.)
24. A one-cup serving of pineapple juice has 9 more than three times as many calories as a one-cup serving of tomato juice. Servings of the two juices contain a total of 173 calories. How many calories are in a serving of each type of juice? (Source: U.S. Agriculture Department.)



Solve each problem. See Example 3.

25. The value of a “Mint State-63” (uncirculated) 1950 Jefferson nickel minted at Denver is  $\frac{4}{3}$  the value of a similar condition 1944 nickel minted at Philadelphia. Together, the value of the two coins is \$28.00. What is the value of each coin? (Source: Yeoman, R., *A Guide Book of United States Coins*, edited by K. Bressett, 61st edition, 2008.)
26. In one day, a store sold  $\frac{8}{5}$  as many DVDs as CDs. The total number of DVDs and CDs sold that day was 273. How many DVDs were sold?

27. The world’s largest taco was made in the city of Mexicali, Mexico. The taco contained approximately 1 kg of onion for every 6.6 kg of grilled steak. The total weight of these two ingredients was 617.6 kg. To the nearest tenth of a kilogram, how many kilograms of onions and how many kilograms of grilled steak were used to make the taco? (Source: Guinness World Records.)
28. The world’s most populous countries are China and India. As of mid-2005, the combined population of these two countries was estimated at 2.4 billion. If there were about  $\frac{4}{5}$  as many people living in India as China, what was the population of each country, to the nearest tenth of a billion? (Source: U.S. Census Bureau.)



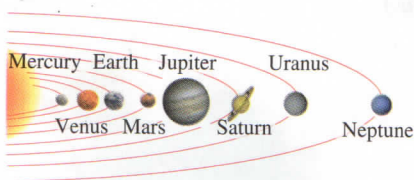
29. U.S. five-cent coins are made from a combination of two metals: nickel and copper. For every pound of nickel, 3 lb of copper are used. How many pounds of copper would be needed to make 560 lb of five-cent coins? (Source: The United States Mint.)
30. A bakery makes a special whole-grain bread using two kinds of flour: whole wheat and rye. The recipe for this bread calls for 1 oz of rye flour for every 4 oz of whole-wheat flour. How many ounces of each kind of flour should be used to make a loaf of bread weighing 32 oz?

Solve each problem. See Example 4.

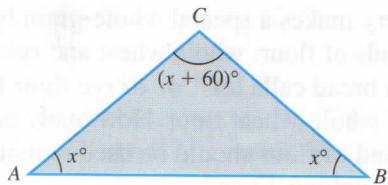
31. Al Moser, an office manager, books airline tickets for business trips that employees need to make. In one week, he booked 55 tickets. He booked 7 more tickets on American Airlines than United Airlines. On Southwest Airlines, he booked 4 more than twice as many tickets as on United. How many tickets did he book on each airline?

33. The United States earned 103 medals at the 2004 Summer Olympics in Athens. The number of silver medals earned was 4 more than the number of gold medals. The number of bronze medals earned was 6 less than the number of gold medals. How many of each kind of medal did the United States earn? (Source: *The Gazette*, August 30, 2004.)

35. Venus is 31.2 million mi farther from the sun than Mercury, while Earth is 57 million mi farther from the sun than Mercury. If the total of the distances from these three planets to the sun is 196.2 million mi, how far away from the sun is Mercury? (All distances given here are mean (average) distances.) (Source: *The New York Times Almanac*.)

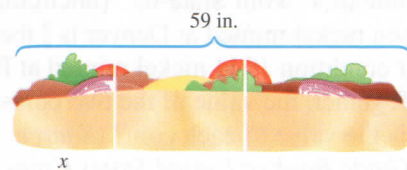


37. The sum of the measures of the angles of any triangle is  $180^\circ$ . In triangle  $ABC$ , angles  $A$  and  $B$  have the same measure, while the measure of angle  $C$  is  $60^\circ$  greater than each of  $A$  and  $B$ . What are the measures of the three angles?



32. Lauren Morse, a mathematics textbook editor, works 7.5 hr a day. She spent a recent day making telephone calls, writing e-mails, and attending meetings. She spent twice as much time attending meetings as making telephone calls and 0.5 hr longer writing e-mails than making telephone calls. How many hours did she spend on each task?

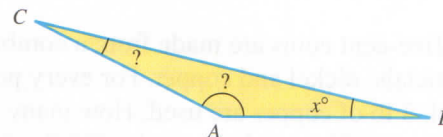
34. Nagaraj Nanjappa has a party-length submarine sandwich 59 in. long. He wants to cut it into three pieces so that the middle piece is 5 in. longer than the shortest piece and the shortest piece is 9 in. shorter than the longest piece. How long should the three pieces be?



36. Saturn, Jupiter, and Uranus together have a total of 137 known satellites (moons). Jupiter has 16 more satellites than Saturn, and Uranus has 20 fewer satellites than Saturn. How many known satellites does Uranus have? (Source: *The New York Times Almanac*.)



38. In triangle  $ABC$ , the measure of angle  $A$  is  $141^\circ$  more than the measure of angle  $B$ . The measure of angle  $B$  is the same as the measure of angle  $C$ . Find the measure of each angle. (Hint: See Exercise 37.)



Use the concepts of this section to answer each question.

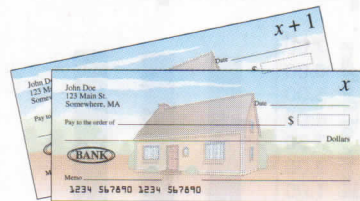
39. Is there an angle that is equal to its supplement? Is there an angle that is equal to its complement? If the answer is yes to either question, give the measure of the angle.
40. If  $x$  represents an integer, how can you express the next smaller consecutive integer in terms of  $x$ ? The next smaller even integer?

Solve each problem. See Examples 5 and 6.

41. Find the measure of an angle whose complement is four times its measure.
42. Find the measure of an angle whose complement is five times its measure.
43. Find the measure of an angle whose supplement is eight times its measure.
44. Find the measure of an angle whose supplement is three times its measure.
45. Find the measure of an angle whose supplement measures  $39^\circ$  more than twice its complement.
46. Find the measure of an angle whose supplement measures  $38^\circ$  less than three times its complement.
47. Find the measure of an angle such that the difference between the measures of its supplement and three times its complement is  $10^\circ$ .
48. Find the measure of an angle such that the sum of the measures of its complement and its supplement is  $160^\circ$ .

Solve each problem. See Examples 7 and 8.

49. The numbers on two consecutively numbered gym lockers have a sum of 137. What are the locker numbers?
50. The sum of two consecutive check numbers is 357. Find the numbers.



51. Two pages that are back-to-back in this book have 293 as the sum of their page numbers. What are the page numbers?
52. Two houses on the same side of the street have house numbers that are consecutive even integers. The sum of the integers is 58. What are the two house numbers?
53. Find two consecutive even integers such that the lesser added to three times the greater gives a sum of 46.
54. Find two consecutive odd integers such that twice the greater is 17 more than the lesser.
55. When the lesser of two consecutive integers is added to three times the greater, the result is 43. Find the integers.
56. If five times the lesser of two consecutive integers is added to three times the greater, the result is 59. Find the integers.
57. If the sum of three consecutive even integers is 60, what is the first of the three even integers? (*Hint: If  $x$  and  $x + 2$  represent the first two consecutive even integers, how would you represent the third consecutive even integer?*)
58. If the sum of three consecutive odd integers is 69, what is the third of the three odd integers?

Apply the ideas of this section to solve Exercises 59 and 60, which are based on the graphs.

59. In 2003, federal funding for Head Start programs increased by \$0.13 billion from the previous year. The increase from 2003 to 2004 was \$0.10 billion. Over the three-year period 2002–2004, the total funding was \$19.98 billion. What was federal Head Start funding for each of these years? (*Source: U.S. Department of Health and Human Services.*)
60. In a typical group of 1000 workers from each of the boatbuilding, iron foundry, and amusement park/arcade industries, there were 30 more injuries in iron foundries (I) than in amusement parks/arcades (A). There were 12 more injuries in amusement parks/arcades than in boatbuilding (B). Among these workers, there were 387 nonfatal occupational injuries. How many injuries took place in each industry? (*Source: U.S. Bureau of Labor Statistics.*)

