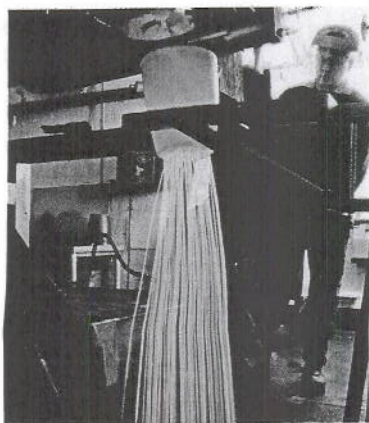


23. *Gold Temperatures.* Gold stays solid at Fahrenheit temperatures below  $1945.4^\circ$ . Determine (in terms of an inequality) those Celsius temperatures for which gold stays solid. Use the formula given in Margin Exercise 11.

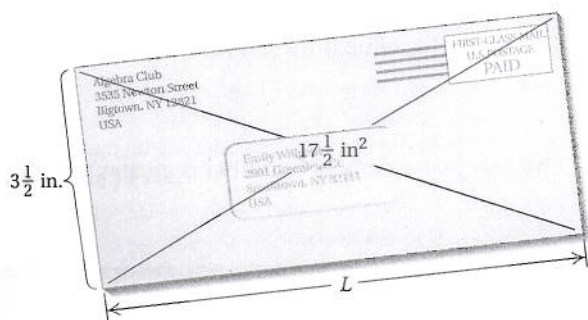


25. *World Records in the 1500-m Run.* The formula

$$R = -0.075t + 3.85$$

can be used to predict the world record in the 1500-m run  $t$  years after 1930. Determine (in terms of an inequality) those years for which the world record will be less than 3.5 min.

27. *Sizes of Envelopes.* Rhetoric Advertising is a direct-mail company. It determines that for a particular campaign, it can use any envelope with a fixed width of  $3\frac{1}{2}$  in. and an area of at least  $17\frac{1}{2}$  in<sup>2</sup>. Determine (in terms of an inequality) those lengths that will satisfy the company constraints.



29. *Blueprints.* To make copies of blueprints, Vantage Reprographics charges a \$5 setup fee plus \$4 per copy. Myra can spend no more than \$65 for the copying. What numbers of copies will allow her to stay within budget?

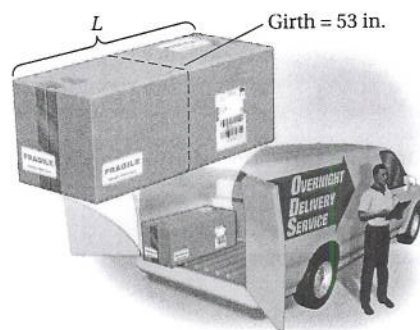
24. *Body Temperatures.* The human body is considered to be fevered when its temperature is higher than  $98.6^\circ\text{F}$ . Using the formula given in Margin Exercise 11, determine (in terms of an inequality) those Celsius temperatures for which the body is fevered.

26. *World Records in the 200-m Dash.* The formula

$$R = -0.028t + 20.8$$

can be used to predict the world record in the 200-m dash  $t$  years after 1920. Determine (in terms of an inequality) those years for which the world record will be less than 19.0 sec.

28. *Sizes of Packages.* An overnight delivery service accepts packages of up to 165 in. in length and girth combined. (Girth is the distance around the package.) A package has a fixed girth of 53 in. Determine (in terms of an inequality) those lengths for which a package is acceptable.



30. *Banquet Costs.* The women's volleyball team can spend at most \$450 for its awards banquet at a local restaurant. If the restaurant charges a \$40 setup fee plus \$16 per person, at most how many can attend?

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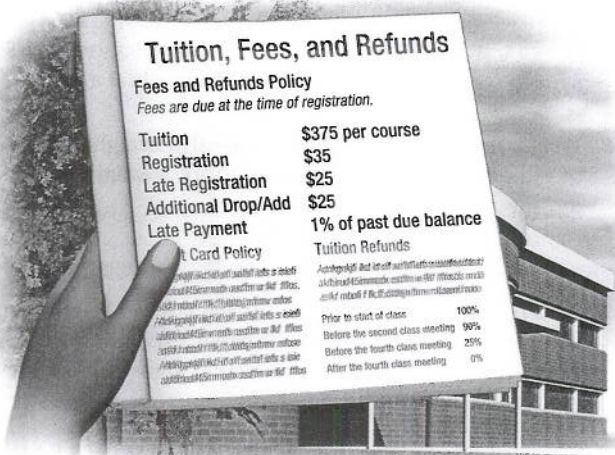
39. Area of  
4 cm. I

31. *Phone Costs.* Simon claims that it costs him at least \$3.00 every time he calls an overseas customer. If his typical call costs 75¢ plus 45¢ for each minute, how long do his calls typically last? (*Hint:* 75¢ = \$0.75.)

33. *College Tuition.* Angelica's financial aid stipulates that her tuition not exceed \$1000. If her local community college charges a \$35 registration fee plus \$375 per course, what is the greatest number of courses for which Angelica can register?

32. *Parking Costs.* Laura is certain that every time she parks in the municipal garage it costs her at least \$2.20. If the garage charges 45¢ plus 25¢ for each half hour, for how long is Laura's car generally parked?

34. *Furnace Repairs.* RJ's Plumbing and Heating charges \$25 plus \$30 per hour for emergency service. Gary remembers being billed over \$100 for an emergency call. How long was RJ's there?



35. *Nutrition.* Following the guidelines of the Food and Drug Administration, Dale tries to eat at least 5 servings of fruits or vegetables each day. For the first six days of one week, he had 4, 6, 7, 4, 6, and 4 servings. How many servings of fruits or vegetables should Dale eat on Saturday, in order to average at least 5 servings per day for the week?

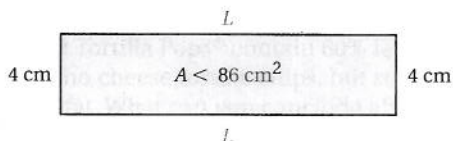
36. *College Course Load.* To remain on financial aid, Millie needs to complete an average of at least 7 credits per quarter each year. In the first three quarters of 2005, Millie completed 5, 7, and 8 credits. How many credits of course work must Millie complete in the fourth quarter if she is to remain on financial aid?

37. *Perimeter of a Rectangle.* The width of a rectangle is fixed at 8 ft. What lengths will make the perimeter at least 200 ft? at most 200 ft?

38. *Perimeter of a Triangle.* One side of a triangle is 2 cm shorter than the base. The other side is 3 cm longer than the base. What lengths of the base will allow the perimeter to be greater than 19 cm?

39. *Area of a Rectangle.* The width of a rectangle is fixed at 4 cm. For what lengths will the area be less than  $86 \text{ cm}^2$ ?

40. *Area of a Rectangle.* The width of a rectangle is fixed at 16 yd. For what lengths will the area be at least  $264 \text{ yd}^2$ ?



**Insurance-covered Repairs.** Most insurance companies will replace a vehicle if an estimated repair exceeds 80% of the "blue-book" value of the vehicle. Michelle's insurance company paid \$8500 for repairs to her Subaru after an accident. What can be concluded about the blue-book value of the car?

**Fat Content in Foods.** Reduced Fat Skippy® peanut butter contains 12 g of fat per serving. In order for a food to be labeled "reduced fat," it must have at least 25% less fat than the regular item. What can you conclude about the number of grams of fat in a serving of the regular Skippy peanut butter?

Source: Best Foods

**Pond Depth.** On July 1, Garrett's Pond was 25 ft deep. Since that date, the water level has dropped  $\frac{2}{3}$  ft per week. For what dates will the water level not exceed 21 ft?

**Area of a Triangular Flag.** As part of an outdoor education course, Wanda needs to make a bright-colored triangular flag with an area of at least  $3 \text{ ft}^2$ . What heights can the triangle be if the base is  $1\frac{1}{2} \text{ ft}$ ?



**Electrician Visits.** Dot's Electric made 17 customer calls last week and 22 calls this week. How many calls must be made next week in order to maintain an average of at least 20 for the three-week period?



**Insurance-covered Repairs.** Following an accident, Jeff's Ford pickup was replaced by his insurance company because the damage was so extensive. Before the damage, the blue-book value of the truck was \$21,000. How much would it have cost to repair the truck? (See Exercise 41.)

**Fat Content in Foods.** Reduced Fat Chips Ahoy!® cookies contain 5 g of fat per serving. What can you conclude about the number of grams of fat in regular Chips Ahoy! cookies (see Exercise 43)?

Source: Nabisco Brands, Inc.

**Weight Gain.** A 3-lb puppy is gaining weight at a rate of  $\frac{3}{4}$  lb per week. When will the puppy's weight exceed  $22\frac{1}{2}$  lb?

**Area of a Triangular Sign.** Zoning laws in Harrington prohibit displaying signs with areas exceeding  $12 \text{ ft}^2$ . If Flo's Marina is ordering a triangular sign with an 8-ft base, how tall can the sign be?



**Volunteer Work.** George and Joan do volunteer work at a hospital. Joan worked 3 more hr than George, and together they worked more than 27 hr. What possible numbers of hours did each work?

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51.  $D_W$  If  $f$  represents Fran's age and  $t$  represents Todd's age, write a sentence that would translate to  $t + 3 < f$ .

52.  $D_W$  Explain how the meanings of "Five more than a number" and "Five is more than a number" differ.

### SKILL MAINTENANCE

#### VOCABULARY REINFORCEMENT

In each of Exercises 53–60, fill in the blank with the correct term from the given list. Some of the choices may not be used.

53. The product of a(n) \_\_\_\_\_ number of negative numbers is always positive. [1.5a]
54. The product of a(n) \_\_\_\_\_ number of negative numbers is always negative. [1.5a]
55. The \_\_\_\_\_ inverse of a negative number is always positive. [1.3b]
56. The \_\_\_\_\_ inverse of a negative number is always negative. [1.6b]
57. Equations with the same solutions are called \_\_\_\_\_ equations. [2.1b]
58. The \_\_\_\_\_ for equations asserts that when we add the same number to the expressions on each side of the equation, we get equivalent equations. [2.1b]
59. The \_\_\_\_\_ for inequalities asserts that when we multiply or divide by a negative number on both sides of an inequality, the direction of the inequality symbol \_\_\_\_\_ . [2.7d]
60. Any replacement for the variable that makes an equation true is called a(n) \_\_\_\_\_ of the equation. [2.1a]

addition principle  
multiplication principle  
solution  
replacement  
variable  
is reversed  
stays the same  
even  
odd  
multiplicative  
additive  
equivalent

### SYNTHESIS

61. *Ski Wax.* Green ski wax works best between  $5^\circ$  and  $15^\circ$  Fahrenheit. Determine those Celsius temperatures for which green ski wax works best.

62. *Parking Fees.* Mack's Parking Garage charges \$4.00 for the first hour and \$2.50 for each additional hour. For how long has a car been parked when the charge exceeds \$16.50?

63. *Nutritional Standards.* In order for a food to be labeled "lowfat," it must have fewer than 3 g of fat per serving. Reduced fat Tortilla Pops<sup>®</sup> contain 60% less fat than regular nacho cheese tortilla chips, but still cannot be labeled lowfat. What can you conclude about the fat content of a serving of nacho cheese tortilla chips?

64. *Parking Fees.* When asked how much the parking charge is for a certain car (see Exercise 62), Mack replies "between 14 and 24 dollars." For how long has the car been parked?

The review that follows is meant to prepare you for a chapter exam. It consists of three parts. The first part, Concept Reinforcement, is designed to increase understanding of the concepts through true/false exercises. The second part is a list of important properties and formulas. The third part is the Review Exercises. These provide practice exercises for the exam, together with references to section objectives so you can go back and review. Before beginning, stop and look back over the skills you have obtained. What skills in mathematics do you have now that you did not have before studying this chapter?

### CONCEPT REINFORCEMENT

Determine whether the statement is true or false. Answers are given at the back of the book.

- \_\_\_\_\_ 1. If  $x > y$ , then  $-x < -y$ .
- \_\_\_\_\_ 2. Consecutive odd integers are 2 units apart.
- \_\_\_\_\_ 3. For any number  $n$ ,  $n \geq n$ .
- \_\_\_\_\_ 4.  $3 - x = 4x$  and  $5x = -3$  are equivalent equations.
- \_\_\_\_\_ 5. Some equations have no solution.
- \_\_\_\_\_ 6.  $2x - 7 < 11$  and  $x < -9$  are equivalent inequalities.

### IMPORTANT PROPERTIES AND FORMULAS

*The Addition Principle for Equations:*

For any real numbers  $a$ ,  $b$ , and  $c$ :  $a = b$  is equivalent to  $a + c = b + c$ .

*The Multiplication Principle for Equations:*

For any real numbers  $a$ ,  $b$ , and  $c$ ,  $c \neq 0$ :  $a = b$  is equivalent to  $a \cdot c = b \cdot c$ .

*The Addition Principle for Inequalities:*

For any real numbers  $a$ ,  $b$ , and  $c$ :

$a < b$  is equivalent to  $a + c < b + c$ ;

$a > b$  is equivalent to  $a + c > b + c$ ;

$a \leq b$  is equivalent to  $a + c \leq b + c$ ;

$a \geq b$  is equivalent to  $a + c \geq b + c$ .

*The Multiplication Principle for Inequalities:*

For any real numbers  $a$  and  $b$ , and any *positive* number  $c$ :

$a < b$  is equivalent to  $ac < bc$ ;  $a > b$  is equivalent to  $ac > bc$ .

For any real numbers  $a$  and  $b$ , and any *negative* number  $c$ :

$a < b$  is equivalent to  $ac > bc$ ;  $a > b$  is equivalent to  $ac < bc$ .

## Review Exercises

Solve. [2.1b]

1.  $x + 5 = -17$

2.  $n - 7 = -6$

3.  $x - 11 = 14$

4.  $y - 0.9 = 9.09$

Solve. [2.2a]

5.  $-\frac{2}{3}x = -\frac{1}{6}$

6.  $-8x = -56$

7.  $-\frac{x}{4} = 48$

8.  $15x = -35$

9.  $\frac{4}{5}y = -\frac{3}{16}$

Solve.

10. 5

Solve.

12.  $5t$

14. 14

15.  $0.2$

16.  $\frac{1}{4}$

17.  $14j$

Solve.

18.  $4(x$

20.  $8(x$

21.  $-5x$

22.  $6(x$

Determine the inequality.

23.  $-3$

Solve. Write the solution set.

26.  $y + 7 < 12$

28.  $2 + 6 < x$

30.  $3x + 2 < 14$

32.  $4 - 8 < x$

Solve. [2.3a]

10.  $5 - x = 13$

11.  $\frac{1}{4}x - \frac{5}{8} = \frac{3}{8}$

Solve. [2.3b, c]

12.  $5t + 9 = 3t - 1$

13.  $7x - 6 = 25x$

14.  $14y = 23y - 17 - 10$

15.  $0.22y - 0.6 = 0.12y + 3 - 0.8y$

16.  $\frac{1}{4}x - \frac{1}{8}x = 3 - \frac{1}{16}x$

17.  $14y + 17 + 7y = 9 + 21y + 8$

Solve. [2.3c]

18.  $4(x + 3) = 36$

19.  $3(5x - 7) = -66$

20.  $8(x - 2) - 5(x + 4) = 20 + x$

21.  $-5x + 3(x + 8) = 16$

22.  $6(x - 2) - 16 = 3(2x - 5) + 11$

Determine whether the given number is a solution of the inequality  $x \leq 4$ . [2.7a]

23. -3

24. 7

25. 4

Solve. Write set notation for the answers. [2.7c, d, e]

26.  $y + \frac{2}{3} \geq \frac{1}{6}$

27.  $9x \geq 63$

28.  $2 + 6y > 14$

29.  $7 - 3y \geq 27 + 2y$

30.  $3x + 5 < 2x - 6$

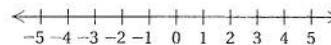
31.  $-4y < 28$

32.  $4 - 8x < 13 + 3x$

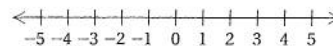
33.  $-4x \leq \frac{1}{3}$

Graph on a number line. [2.7b, e]

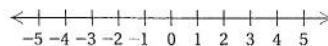
34.  $4x - 6 < x + 3$



35.  $-2 < x \leq 5$



36.  $y > 0$



Solve. [2.4b]

37.  $C = \pi d$ , for  $d$

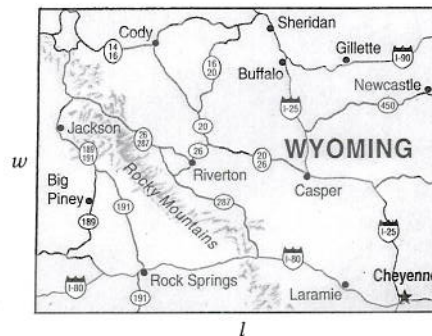
38.  $V = \frac{1}{3}Bh$ , for  $B$

39.  $A = \frac{a + b}{2}$ , for  $a$

40.  $y = mx + b$ , for  $x$

Solve. [2.6a]

41. Dimensions of Wyoming. The state of Wyoming is roughly in the shape of a rectangle whose perimeter is 1280 mi. The length is 90 mi more than the width. Find the dimensions.



42. Interstate Mile Markers. The sum of two consecutive mile markers on I-5 in California is 691. Find the numbers on the markers.

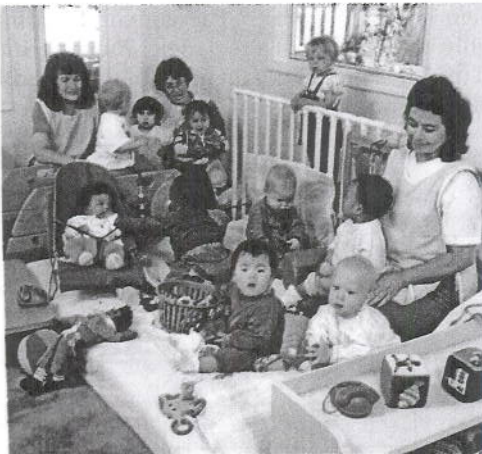
43. An entertainment center sold for \$2449 in June. This was \$332 more than the cost in February. Find the cost in February.
44. Ty is paid a commission of \$4 for each appliance he sells. One week, he received \$108 in commissions. How many appliances did he sell?
45. The measure of the second angle of a triangle is  $50^\circ$  more than that of the first angle. The measure of the third angle is  $10^\circ$  less than twice the first angle. Find the measures of the angles.

Solve. [2.5a]

46. What number is 20% of 75?
47. Fifteen is what percent of 80?
48. 18 is 3% of what number?

49. *Job Opportunities.* There were 905 thousand child-care workers in 1998. Job opportunities are expected to grow to 1141 thousand by 2008. What is the percent of increase?

Source: *Handbook of U.S. Labor Statistics*



Solve. [2.6a]

50. After a 30% reduction, a bread maker is on sale for \$154. What was the marked price (the price before the reduction)?

51. A hotel manager's salary is \$61,410, which is a 15% increase over the previous year's salary. What was the previous salary?

52. A tax-exempt charity received a bill of \$145.90 for a sump pump. The bill incorrectly included sales tax of 5%. How much does the charity actually owe?

Solve. [2.8b]

53. *Test Scores.* Your test grades are 71, 75, 82, and 86. What is the lowest grade that you can get on the next test and still have an average test score of at least 80?

54. The length of a rectangle is 43 cm. What widths will make the perimeter greater than 120 cm?

55. *D<sub>W</sub>* Would it be better to receive a 5% raise and then an 8% raise or the other way around? Why? [2.5a]

56. *D<sub>W</sub>* Are the inequalities  $x > -5$  and  $-x < 5$  equivalent? Why or why not? [2.7d]

### SYNTHESIS

Solve.

57.  $2|x| + 4 = 50$  [1.2e], [2.3a]
58.  $|3x| = 60$  [1.2e], [2.2a]
59.  $y = 2a - ab + 3$ , for  $a$  [2.4b]

Solve.

1.  $x + 7$

4.  $-\frac{4}{7}x$

7.  $8 - y =$

10.  $-3x -$

12.  $4(3x -$

Solve. Write

14.  $x + 6 \leq$

17.  $-2y \geq 2$

20.  $4 - 6x >$

Graph on a r

22.  $y \leq 9$

24.  $-2 \leq x \leq$

Solve.

25. What nun

27. 800 is 2% ,



Solve.

1.  $x + 7 = 15$

2.  $t - 9 = 17$

3.  $3x = -18$

4.  $-\frac{4}{7}x = -28$

5.  $3t + 7 = 2t - 5$

6.  $\frac{1}{2}x - \frac{3}{5} = \frac{2}{5}$

7.  $8 - y = 16$

8.  $-\frac{2}{5} + x = -\frac{3}{4}$

9.  $3(x + 2) = 27$

10.  $-3x - 6(x - 4) = 9$

11.  $0.4p + 0.2 = 4.2p - 7.8 - 0.6p$

12.  $4(3x - 1) + 11 = 2(6x + 5) - 8$

13.  $-2 + 7x + 6 = 5x + 4 + 2x$

Solve. Write set notation for the answers.

14.  $x + 6 \leq 2$

15.  $14x + 9 > 13x - 4$

16.  $12x \leq 60$

17.  $-2y \geq 26$

18.  $-4y \leq -32$

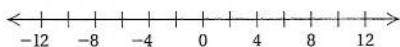
19.  $-5x \geq \frac{1}{4}$

20.  $4 - 6x > 40$

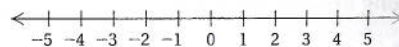
21.  $5 - 9x \geq 19 + 5x$

Graph on a number line.

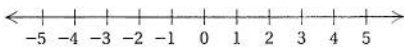
22.  $y \leq 9$



23.  $6x - 3 < x + 2$



24.  $-2 \leq x \leq 2$



Solve.

25. What number is 24% of 75?

26. 15.84 is what percent of 96?

27. 800 is 2% of what number?

28. **Job Opportunities.** Job opportunities for physician's assistants are expected to increase from 58,000 in 2000 to 89,000 in 2010. What is the percent of increase?

Source: *Monthly Labor Review*, November 2001

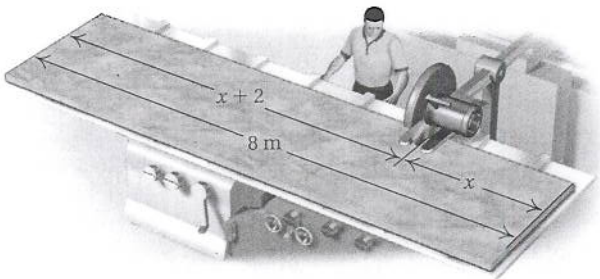




29. *Perimeter of a Photograph.* The perimeter of a rectangular photograph is 36 cm. The length is 4 cm greater than the width. Find the width and the length.

31. *Raffle Tickets.* The numbers on three raffle tickets are consecutive integers whose sum is 7530. Find the integers.

33. *Board Cutting.* An 8-m board is cut into two pieces. One piece is 2 m longer than the other. How long are the pieces?



35. *Budgeting.* Jason has budgeted an average of \$95 a month for entertainment. For the first five months of the year, he has spent \$98, \$89, \$110, \$85, and \$83. How much can Jason spend in the sixth month without exceeding his average budget?

37. Solve  $A = 2\pi rh$  for  $r$ .

30. *Charitable Contributions.* About 35.9% of all charitable contributions are made to religious organizations. In 2003, about \$86.4 billion was given to religious organizations. How much was given to charities in general?

Source: AAFRC Trust for Philanthropy/Giving USA 2004

32. *Savings Account.* Money is invested in a savings account at 5% simple interest. After 1 year, there is \$924 in the account. How much was originally invested?

34. *Lengths of a Rectangle.* The width of a rectangle is 96 yd. Find all possible lengths such that the perimeter of the rectangle will be at least 540 yd.

36. *Copy Machine Rental.* It costs \$225 per month plus 1.2¢ per copy to rent a copy machine. A catalog publisher needs to lease a copy machine for use during a special project that they anticipate will take 3 months. They decide to rent the copier, but must stay within a budget of \$2400 for copies. Determine (in terms of an inequality) the number of copies they can make and still remain within budget.

38. Solve  $y = 8x + b$  for  $x$ .

**SYNTHESIS**

39. Solve  $c = \frac{1}{a-d}$  for  $d$ .

40. Solve:  $3|w| - 8 = 37$ .

41. A movie theater had a certain number of tickets to give away. Five people got the tickets. The first got one-third of the tickets, the second got one-fourth of the tickets, and the third got one-fifth of the tickets. The fourth person got eight tickets, and there were five tickets left for the fifth person. Find the total number of tickets given away.

Test: Chapter 1, p. 79

1. [1.1a] 6    2. [1.1b]  $x - 9$     3. [1.1a] 240 ft<sup>2</sup>  
 4. [1.2d] <    5. [1.2d] >    6. [1.2d] >    7. [1.2d] <  
 8. [1.2e] 7    9. [1.2e]  $\frac{9}{4}$     10. [1.2e] 2.7    11. [1.3b]  $-\frac{2}{3}$   
 12. [1.3b] 1.4    13. [1.3b] 8    14. [1.6b]  $-\frac{1}{2}$   
 15. [1.6b]  $\frac{7}{4}$     16. [1.4a] 7.8    17. [1.3a] -8  
 18. [1.3a]  $\frac{7}{40}$     19. [1.4a] 10    20. [1.4a] -2.5  
 21. [1.4a]  $\frac{7}{8}$     22. [1.5a] -48    23. [1.5a]  $\frac{3}{16}$   
 24. [1.6a] -9    25. [1.6c]  $\frac{3}{4}$     26. [1.6c] -9.728  
 27. [1.8d] -173    28. [1.8d] -5    29. [1.4b] 14°F  
 30. [1.3c], [1.4b] Up 15 points    31. [1.5b] 16,080  
 32. [1.6d]  $\frac{33}{35}$ °C per minute    33. [1.7c]  $18 - 3x$   
 34. [1.7c]  $-5y + 5$     35. [1.7d]  $2(6 - 11x)$   
 36. [1.7d]  $7(x + 3 + 2y)$     37. [1.4a] 12  
 38. [1.8b]  $2x + 7$     39. [1.8b]  $9a - 12b - 7$   
 40. [1.8c]  $68y - 8$     41. [1.8d] -4    42. [1.8d] 448  
 43. [1.2d]  $-2 \geq x$     44. [1.2e], [1.8d] 15  
 45. [1.8c]  $4a$     46. [1.7e]  $4x + 4y$

CHAPTER 2

Margin Exercises, Section 2.1, pp. 82-85

1. False    2. True    3. Neither    4. Yes    5. No  
 6. No    7. Yes    8. 9    9. -13    10. 22    11. 13.2  
 12. -6.5    13. -2    14.  $\frac{31}{8}$

Exercise Set 2.1, p. 86

1. Yes    3. No    5. No    7. Yes    9. No    11. No  
 13. 4    15. -20    17. -14    19. -18    21. 15  
 23. -14    25. 2    27. 20    29. -6    31.  $6\frac{1}{2}$     33. 19.9  
 35.  $\frac{7}{3}$     37.  $-\frac{7}{4}$     39.  $\frac{41}{24}$     41.  $-\frac{1}{20}$     43. 5.1    45. 12.4  
 47. -5    49.  $1\frac{5}{6}$     51.  $-\frac{10}{21}$     53. DW    55. -11    56. 5  
 57.  $-\frac{5}{12}$     58.  $\frac{1}{3}$     59.  $-\frac{3}{2}$     60. -5.2    61.  $-\frac{1}{24}$   
 62. 172.72    63.  $\$83 - x$     64. 65t miles    65. 342.246  
 67.  $-\frac{26}{15}$     69. -10    71. All real numbers    73.  $-\frac{5}{17}$   
 75. 13, -13

Margin Exercises, Section 2.2, pp. 88-91

1. 15    2.  $-\frac{7}{4}$     3. -18    4. 10    5. 10    6.  $-\frac{4}{5}$   
 7. 7800    8. -3    9. 28

Exercise Set 2.2, p. 92

1. 6    3. 9    5. 12    7. -40    9. 1    11. -7    13.  $-\frac{6}{5}$   
 15. 6    17. -63    19. 36    21. -21    23.  $-\frac{3}{5}$     25.  $-\frac{3}{2}$   
 27.  $\frac{9}{2}$     29. 7    31. -7    33. 8    35. 15.9    37. -50

39. -14    41. DW    43. 7x    44.  $-x + 5$     45.  $8x + 11$   
 46.  $-32y$     47.  $x - 4$     48.  $-5x - 23$     49.  $-10y - 42$   
 50.  $-22a + 4$     51. 8r miles    52.  $\frac{1}{2}b \cdot 10 \text{ m}^2$ , or  $5b \text{ m}^2$   
 53. -8655    55. No solution    57. No solution  
 59.  $\frac{b}{3a}$     61.  $\frac{4b}{a}$

Margin Exercises, Section 2.3, pp. 94-100

1. 5    2. 4    3. 4    4. 39    5.  $-\frac{3}{2}$     6. -4.3    7. -3  
 8. 800    9. 1    10. 2    11. 2    12.  $\frac{17}{2}$     13.  $\frac{8}{3}$   
 14.  $-\frac{43}{10}$ , or -4.3    15. 2    16. 3    17. -2    18.  $-\frac{1}{2}$   
 19. Yes    20. Yes    21. Yes    22. Yes    23. No  
 24. No    25. No    26. No    27. All real numbers  
 28. No solution

Calculator Corner, p. 101

1. Left to the student    2. Left to the student

Exercise Set 2.3, p. 102

1. 5    3. 8    5. 10    7. 14    9. -8    11. -8    13. -7  
 15.  $\frac{2}{3}$     17. 6    19. 4    21. 6    23. -3    25. 1  
 27. 6    29. -20    31. 7    33. 2    35. 5    37. 2  
 39. 10    41. 4    43. 0    45. -1    47.  $-\frac{4}{3}$     49.  $\frac{2}{5}$   
 51. -2    53. -4    55.  $\frac{4}{5}$     57.  $-\frac{28}{27}$     59. 6    61. 2  
 63. No solution    65. All real numbers    67. 6    69. 8  
 71. 1    73. All real numbers    75. No solution  
 77. 17    79.  $-\frac{5}{3}$     81. -3    83. 2    85.  $\frac{4}{7}$   
 87. No solution    89. All real numbers    91.  $-\frac{51}{31}$   
 93. DW    95. -6.5    96. -75.14    97.  $7(x - 3 - 2y)$   
 98.  $8(y - 11x + 1)$     99. -160    100.  $-17x + 18$   
 101.  $91x - 242$     102. 0.25    103.  $-\frac{5}{32}$     105.  $\frac{52}{45}$

Margin Exercises, Section 2.4, pp. 106-109

1. 2.8 mi    2. 280,865 socks    3. 341 mi    4.  $q = 3B$   
 5.  $r = \frac{d}{t}$     6.  $I = \frac{E}{R}$     7.  $x = y - 5$     8.  $x = y + 7$   
 9.  $x = y + b$     10.  $y = \frac{5x}{9}$ , or  $\frac{5}{9}x$     11.  $p = \frac{bq}{a}$   
 12.  $x = \frac{y - b}{m}$     13.  $Q = \frac{a + p}{t}$     14.  $D = \frac{C}{\pi}$   
 15.  $c = 4A - a - b - d$

Exercise Set 2.4, p. 110

1. (a) 57,000 Btu's; (b)  $a = \frac{B}{30}$     3. (a)  $1\frac{3}{5}$  mi; (b)  $t = 5M$   
 5. (a) 1423 students; (b)  $n = 15f$   
 7. 10.5 calories per ounce    9. 42 games    11.  $x = \frac{y}{5}$   
 13.  $c = \frac{a}{b}$     15.  $x = y - 13$     17.  $x = y - b$

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19.  $x = 5 - y$    21.  $x = a - y$    23.  $y = \frac{5x}{8}$ , or  $\frac{5}{8}x$   
 25.  $x = \frac{By}{A}$    27.  $t = \frac{W - b}{m}$    29.  $x = \frac{y - c}{b}$   
 31.  $b = 3A - a - c$    33.  $t = \frac{A - b}{a}$    35.  $h = \frac{A}{b}$   
 37.  $w = \frac{P - 2l}{2}$ , or  $\frac{1}{2}P - l$    39.  $a = 2A - b$   
 41.  $a = \frac{F}{m}$    43.  $c^2 = \frac{E}{m}$    45.  $x = \frac{c - By}{A}$    47.  $t = \frac{3k}{v}$   
 49. **DW**   51. 1   52. -90   53. -9.325   54. 44  
 55. -13.2   56.  $-21a + 12b$    57.  $\frac{1}{6}$    58.  $-\frac{3}{2}$

59. (a) 1901 calories;  
 (b)  $a = \frac{917 + 6w + 6h - K}{6}$ ;  
 $h = \frac{K - 917 - 6w + 6a}{6}$ ;  
 $w = \frac{K - 917 - 6h + 6a}{6}$

61.  $b = \frac{Ha - 2}{H}$ , or  $a - \frac{2}{H}$ ;  $a = \frac{2 + Hb}{H}$ , or  $\frac{2}{H} + b$   
 63. A quadruples.   65. A increases by  $2h$  units.

Margin Exercises, Section 2.5, pp. 114-117

1.  $13\% \cdot 80 = a$    2.  $a = 60\% \cdot 70$    3.  $43 = 20\% \cdot b$   
 4.  $110\% \cdot b = 30$    5.  $16 = n \cdot 80$    6.  $n \cdot 94 = 10.5$   
 7. 1.92   8. 115   9. 36%   10. 111,416 mi<sup>2</sup>  
 11. About 1.2 million   12. About 58%

Exercise Set 2.5, p. 118

1. 20%   3. 150   5. 546   7. 24%   9. 2.5   11. 5%  
 13. 25%   15. 84   17. 24%   19. 16%   21.  $46\frac{2}{3}$   
 23. 0.8   25. 5   27. 40   29. \$198   31. \$1584  
 33. \$528   35. Japan: 44.3%; Germany: 24.9%  
 37. About 603 at-bats   39. \$195   41. (a) 16%; (b) \$29  
 43. (a) \$3.75; (b) \$28.75   45. (a) \$28.80; (b) \$33.12  
 47. 200 women   49. About 31.5 lb   51. \$655; 196%  
 53. \$2190; \$1455   55. \$3935; 261%   57. **DW**  
 59. -11   60. -100   61.  $-\frac{2}{5}$    62. 2   63.  $a + c$   
 64.  $7x - 9y$    65. -3.9   66.  $-6\frac{1}{8}$    67. Division;  
 subtraction   68. Exponential; division; subtraction  
 69. 6 ft 7 in.

Margin Exercises, Section 2.6, pp. 123-132

1.  $62\frac{2}{3}$  mi   2. Jenny: 8 in.; Emma: 4 in.; Sarah: 6 in.  
 3. 313 and 314   4. 60,417 copies  
 5. Length: 84 ft; width: 50 ft   6. First: 30°; second: 90°;  
 third: 60°   7. Second: 80; third: 89   8. \$8400   9. \$658

Translating for Success, p. 133

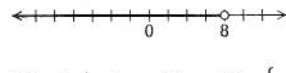
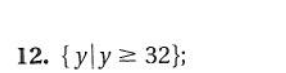
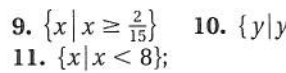
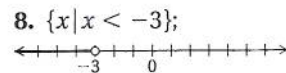
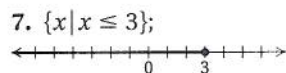
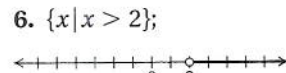
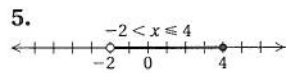
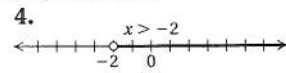
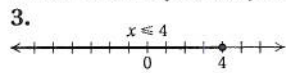
1. B   2. H   3. G   4. N   5. J   6. C   7. L   8. E  
 9. F   10. D

Exercise Set 2.6, p. 134

1. 180 in.; 60 in.   3. \$4.29   5. \$6.3 billion   7.  $699\frac{1}{3}$  mi  
 9. 1204 and 1205   11. 41, 42, 43   13. 61, 63, 65  
 15. Length: 48 ft; width: 14 ft   17. \$75   19. \$85  
 21. 11 visits   23. 28°, 84°, 68°   25. 33°, 38°, 109°  
 27. \$350   29. \$852.94   31. 12 mi   33. \$36  
 35. \$25 and \$50   37. **DW**   39.  $-\frac{47}{40}$    40.  $-\frac{17}{40}$   
 41.  $-\frac{3}{10}$    42.  $-\frac{32}{15}$    43. -10   44. 1.6   45. 409.6  
 46. -9.6   47. -41.6   48. 0.1   49. 120 apples  
 51. About 0.65 in.   53. \$9.17, not \$9.10

Margin Exercises, Section 2.7, pp. 139-146

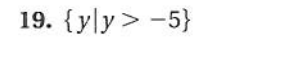
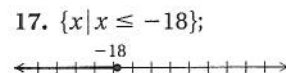
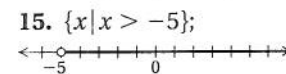
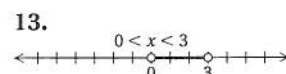
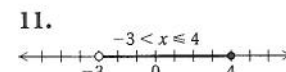
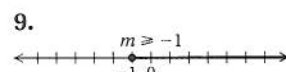
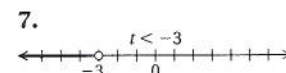
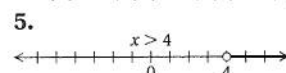
1. (a) No; (b) no; (c) no; (d) yes; (e) no; (f) no  
 2. (a) Yes; (b) yes; (c) yes; (d) no; (e) yes; (f) yes



13.  $\{x | x ≥ -6\}$    14.  $\{y | y < -\frac{13}{5}\}$   
 15.  $\{x | x > -\frac{1}{4}\}$    16.  $\{y | y ≥ \frac{19}{9}\}$    17.  $\{y | y ≥ \frac{19}{9}\}$   
 18.  $\{x | x ≥ -2\}$    19.  $\{x | x ≥ -4\}$    20.  $\{x | x > \frac{8}{3}\}$

Exercise Set 2.7, p. 147

1. (a) Yes; (b) yes; (c) no; (d) yes; (e) yes  
 3. (a) No; (b) no; (c) no; (d) yes; (e) no



21.  $\{x | x > 2\}$    23.  $\{x | x ≤ -3\}$    25.  $\{x | x < 4\}$   
 27.  $\{t | t > 14\}$    29.  $\{y | y ≤ \frac{1}{4}\}$    31.  $\{x | x > \frac{7}{12}\}$   
 33.  $\{x | x < 7\}$ ;

35.  $\{x | x < 3\}$ ;
37.  $\{y | y ≥ -\frac{2}{5}\}$    39.  $\{x | x ≥ -6\}$    41.  $\{y | y ≤ 4\}$   
 43.  $\{x | x > \frac{17}{3}\}$    45.  $\{y | y < -\frac{1}{14}\}$    47.  $\{x | x ≤ \frac{3}{10}\}$   
 49.  $\{x | x < 8\}$    51.  $\{x | x ≤ 6\}$    53.  $\{x | x < -3\}$   
 55.  $\{x | x > -3\}$    57.  $\{x | x ≤ 7\}$    59.  $\{x | x > -10\}$

61.  $\{y|y < 2\}$  63.  $\{y|y \geq 3\}$  65.  $\{y|y > -2\}$   
 67.  $\{x|x > -4\}$  69.  $\{x|x \leq 9\}$  71.  $\{y|y \leq -3\}$   
 73.  $\{y|y < 6\}$  75.  $\{m|m \geq 6\}$  77.  $\{t|t < -\frac{5}{3}\}$   
 79.  $\{r|r > -3\}$  81.  $\{x|x \geq -\frac{57}{34}\}$  83.  $\{x|x > -2\}$   
 85.  $D_W$  87.  $-74$  88.  $4.8$  89.  $-\frac{5}{8}$  90.  $-1.11$   
 91.  $-38$  92.  $-\frac{7}{8}$  93.  $-9.4$  94.  $1.11$  95.  $140$   
 96.  $41$  97.  $-2x - 23$  98.  $37x - 1$  99. (a) Yes;  
 (b) yes; (c) no; (d) no; (e) no; (f) yes; (g) yes  
 101. No solution

Margin Exercises, Section 2.8, pp. 151–154

1.  $m \geq 92$  2.  $c \geq 4000$  3.  $p \leq 21,900$   
 4.  $45 < t < 55$  5.  $d > 15$  6.  $w < 110$  7.  $n > -2$   
 8.  $c \leq 12,500$  9.  $d \leq 11.4\%$  10.  $s \geq 23$   
 11.  $\frac{9}{5}C + 32 < 88; \{C|C < 31\frac{1}{9}\}$   
 12.  $\frac{91 + 86 + 89 + s}{4} \geq 90; \{s|s \geq 94\}$

Exercise Set 2.8, p. 155

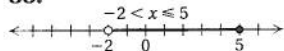
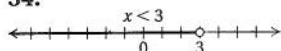
1.  $n \geq 7$  3.  $w > 2 \text{ kg}$  5.  $90 \text{ mph} < s < 110 \text{ mph}$   
 7.  $a \leq 1,200,000$  9.  $c \geq \$1.50$  11.  $x > 8$  13.  $y \leq -4$   
 15.  $n \geq 1300$  17.  $A \leq 500 \text{ L}$  19.  $3x + 2 < 13$   
 21.  $\{x|x \geq 84\}$  23.  $\{C|C < 1063^\circ\}$  25.  $\{Y|Y \geq 1935\}$   
 27.  $\{L|L \geq 5 \text{ in.}\}$  29. 15 or fewer copies 31. 5 min or  
 more 33. 2 courses 35. 4 servings or more  
 37. Lengths greater than or equal to 92 ft; lengths less than  
 or equal to 92 ft 39. Lengths less than 21.5 cm  
 41. The blue-book value is greater than or equal to \$10,625.  
 43. It has at least 16 g of fat. 45. Dates at least 6 weeks  
 after July 1 47. Heights greater than or equal to 4 ft  
 49. 21 calls or more 51.  $D_W$  53. Even 54. Odd  
 55. Additive 56. Multiplicative 57. Equivalent  
 58. Addition principle 59. Multiplication principle;  
 is reversed 60. Solution  
 61. Temperatures between  $-15^\circ\text{C}$  and  $-9\frac{4}{9}^\circ\text{C}$   
 63. They contain at least 7.5 g of fat per serving.

Concept Reinforcement, p. 160

1. True 2. True 3. True 4. False 5. True  
 6. False

Summary and Review: Chapter 2, p. 160

1.  $-22$  2.  $1$  3.  $25$  4.  $9.99$  5.  $\frac{1}{4}$  6.  $7$  7.  $-192$   
 8.  $-\frac{7}{3}$  9.  $-\frac{15}{64}$  10.  $-8$  11.  $4$  12.  $-5$  13.  $-\frac{1}{3}$   
 14.  $3$  15.  $4$  16.  $16$  17. All real numbers 18.  $6$   
 19.  $-3$  20.  $28$  21.  $4$  22. No solution 23. Yes  
 24. No 25. Yes 26.  $\{y|y \geq -\frac{1}{2}\}$  27.  $\{x|x \geq 7\}$   
 28.  $\{y|y > 2\}$  29.  $\{y|y \leq -4\}$  30.  $\{x|x < -11\}$   
 31.  $\{y|y > -7\}$  32.  $\{x|x > -\frac{9}{11}\}$  33.  $\{x|x \geq -\frac{1}{12}\}$   
 34.

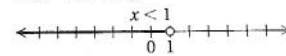
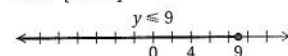


36. 37.  $d = \frac{C}{\pi}$  38.  $B = \frac{3V}{h}$

39.  $a = 2A - b$  40.  $x = \frac{y - b}{m}$  41. Length: 365 mi;  
 width: 275 mi 42. 345, 346 43. \$2117  
 44. 27 appliances 45.  $35^\circ, 85^\circ, 60^\circ$  46. 15  
 47. 18.75% 48. 600 49. About 26% 50. \$220  
 51. \$53,400 52. \$138.95 53. 86 54.  $\{w|w > 17 \text{ cm}\}$   
 55.  $D_W$  The end result is the same either way. If  $s$  is the  
 original salary, the new salary after a 5% raise followed by an  
 8% raise is  $1.08(1.05s)$ . If the raises occur the other way  
 around, the new salary is  $1.05(1.08s)$ . By the commutative  
 and associative laws of multiplication, we see that these are  
 equal. However, it would be better to receive the 8% raise  
 first, because this increase yields a higher salary initially  
 than a 5% raise. 56.  $D_W$  The inequalities are equivalent  
 by the multiplication principle for inequalities. If we  
 multiply both sides of one inequality by  $-1$ , the other  
 inequality results. 57. 23,  $-23$  58. 20,  $-20$   
 59.  $a = \frac{y - 3}{2 - b}$

Test: Chapter 2, p. 163

1. [2.1b] 8 2. [2.1b] 26 3. [2.2a]  $-6$  4. [2.2a] 49  
 5. [2.3b]  $-12$  6. [2.3a] 2 7. [2.3a]  $-8$  8. [2.1b]  $-\frac{7}{20}$   
 9. [2.3c] 7 10. [2.3c]  $\frac{5}{3}$  11. [2.3b]  $\frac{5}{2}$   
 12. [2.3c] No solution 13. [2.3c] All real numbers  
 14. [2.7c]  $\{x|x \leq -4\}$  15. [2.7c]  $\{x|x > -13\}$   
 16. [2.7d]  $\{x|x \leq 5\}$  17. [2.7d]  $\{y|y \leq -13\}$   
 18. [2.7d]  $\{y|y \geq 8\}$  19. [2.7d]  $\{x|x \leq -\frac{1}{20}\}$   
 20. [2.7e]  $\{x|x < -6\}$  21. [2.7e]  $\{x|x \leq -1\}$   
 22. [2.7b] 23. [2.7b, e]



24. [2.7b] 25. [2.5a] 18

26. [2.5a] 16.5% 27. [2.5a] 40,000  
 28. [2.5a] About 53.4% 29. [2.6a] Width: 7 cm; length:  
 11 cm 30. [2.5a] About \$240.7 billion  
 31. [2.6a] 2509, 2510, 2511 32. [2.6a] \$880  
 33. [2.6a] 3 m, 5 m 34. [2.8b]  $\{l|l \geq 174 \text{ yd}\}$   
 35. [2.8b]  $\{b|b \leq \$105\}$  36. [2.8a]  $\{c|c \leq 143,750\}$   
 37. [2.4b]  $r = \frac{A}{2\pi h}$  38. [2.4b]  $x = \frac{y - b}{8}$   
 39. [2.4b]  $d = \frac{1 - ca}{-c}$ , or  $\frac{ca - 1}{c}$   
 40. [1.2e], [2.3a] 15,  $-15$  41. [2.6a] 60 tickets