

Lesson Plan for Block SchedulingHalf-day lesson (See *Pacing the Chapter*, TE pages 1C–1D)

For use with pages 19–25

GOALS

1. Solve linear equations.
2. Use linear equations to solve real-life problems.

State/Local Objectives _____

✓ Check the items you wish to use for this lesson.

STARTING OPTIONS

- _____ Homework Check: TE page 14; Answer Transparencies
 _____ Warm-Up or Daily Homework Quiz: TE pages 19 and 17,
 CRB page 38, or Transparencies

TEACHING OPTIONS

- _____ Motivating the Lesson: TE page 20
 _____ Lesson Opener (Visual Approach): CRB page 39 or Transparencies
 _____ Graphing Calculator Activity with Keystrokes: CRB pages 40–41
 _____ Examples 1–6: SE pages 19–21
 _____ Extra Examples: TE pages 20–21 or Transparencies; Internet
 _____ Technology Activity: SE page 25
 _____ Closure Question: TE page 21
 _____ Guided Practice Exercises: SE page 22

APPLY/HOMEWORK**Homework Assignment (See also the assignment for Lesson 1.4.)**

- _____ Block Schedule: 18–42 even, 43, 44, 46, 47, 50, 57–77 odd

Reteaching the Lesson

- _____ Practice Masters: CRB pages 42–44 (Level A, Level B, Level C)
 _____ Reteaching with Practice: CRB pages 45–46 or Practice Workbook with Examples
 _____ Personal Student Tutor

Extending the Lesson

- _____ Applications (Real Life): CRB page 48
 _____ Challenge: SE page 24; CRB page 49 or Internet

ASSESSMENT OPTIONS

- _____ Checkpoint Exercises: TE pages 20–21 or Transparencies
 _____ Daily Homework Quiz (1.3): TE page 24, CRB page 52, or Transparencies
 _____ Standardized Test Practice: SE page 24; TE page 24; STP Workbook; Transparencies

Notes _____

CHAPTER PACING GUIDE	
Day	Lesson
1	1.1 (all); 1.2 (all)
2	1.3 (all) ; 1.4 (begin)
3	1.4 (end); 1.5 (all)
4	1.6 (all); 1.7 (all)
5	Review/Assess Ch. 1

WARM-UP EXERCISES

For use before Lesson 1.3, pages 19–24

Verify that the statement is true when $x = \frac{2}{3}$.

- $6(1 - x) = 11x - 2(x + 2)$
- $2x - 4(x - 1) = 2(2x - 1) + 3x$

Multiply the expression by the LCD of the denominators and simplify.

- $\frac{2}{5}x - \frac{1}{4}$
- $\frac{11}{6} - \frac{3}{2}x + \frac{2}{7}x$

DAILY HOMEWORK QUIZ

For use after Lesson 1.2, pages 11–18

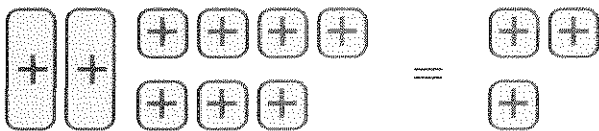
- Write the expression “the p th power of 10” using exponents.
- Evaluate -3^6 .
- Evaluate the expression $18 \div (6 - 3)^2 - 8$.
- Evaluate $(3x^2 - 2) \div (5x)$ when $x = 2$.
- Evaluate $\frac{y(3 - 2x)}{x - y}$ when $x = -2$ and $y = -1$.
- Simplify the expression $5(-3p^2 - 2) + 2(p - p^2)$.

Visual Approach Lesson Opener

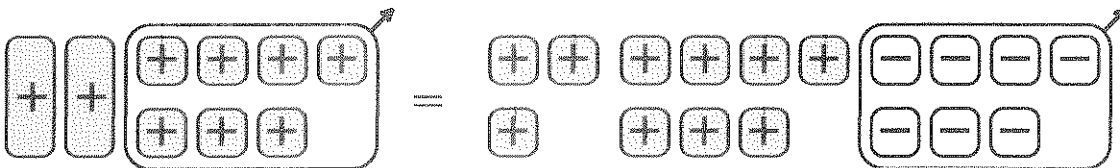
For use with pages 19–24

1. Carry out Steps 1–3 to solve $2x + 7 = -3$ using algebra tiles. Answer the questions in Steps 2 and 3.

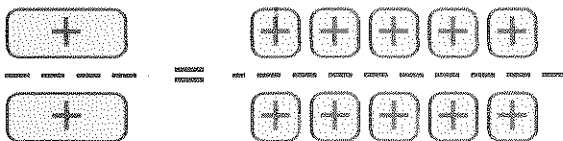
Step 1 Model the equation.



Step 2 Subtract seven 1-tiles from each side. To do this you need to add 7 zero pairs to the right side of the equation. What is the resulting equation?



Step 3 Split the tiles on each side in half. What is the value of x ?



Use algebra tiles to model and solve each equation. (*Hint: To model $x - 5$, you can think of it as $x + (-5)$.)*

2. $2x = 8$

3. $x - 5 = -6$

4. $3x - 4 = 11$

5. $2x + 10 = 4$

Graphing Calculator Activity Keystrokes

For use with page 25

TI-82

Y= 7 X,T,0 - 2 ENTER 4 X,T,0 +

I3 ENTER

2nd [TBLSET] 0 ENTER 1 ENTER ENTER ▼

ENTER 2nd [TABLE]

Use the cursor key ▼ to scroll down to $x = 5$.Look across to see that $y_1 = 33$ and $y_2 = 33$.**TI-83**

Y= 7 X,T,0,n - 2 ENTER 4 X,T,0,n +

I3 ENTER

2nd [TBLSET] 0 ENTER 1 ENTER ENTER ▼

ENTER 2nd [TABLE]

Use the cursor key ▼ to scroll down to $x = 5$.Look across to see that $y_1 = 33$ and $y_2 = 33$.

Graphing Calculator Activity Keystrokes

For use with page 25

SHARP EL-9600c

$\frac{Y=}{7}$ $\frac{X/0/T/n}{-}$ 2 **ENTER** 4 $\frac{X/0/T/n}{+}$

13 **ENTER**

2ndF [TBLSET] **ENTER** \downarrow **ENTER** 1 **ENTER**
[TABLE]

Use the cursor key \downarrow to scroll down to $x = 5$.

Look across to see that $y_1 = 33$ and $y_2 = 33$.

CASIO CFX-9850GA PLUS

From the main menu, choose TABLE.

7 $\frac{X,0,T}{-}$ 2 **EXE** 4 $\frac{X,0,T}{+}$ 13 **EXE**

F5 0 **EXE** 5 **EXE** 1 **EXE** **EXIT** **F6**

Use the cursor key \downarrow to scroll down to $x = 5$.

Look across to see that $y_1 = 33$ and $y_2 = 33$.

Practice A

For use with pages 19–24

Solve the equation. Check your solution.

1. $x + 3 = 0$

2. $x - 7 = 2$

3. $5 + x = 4$

4. $-18 + x = 6$

5. $5 = x + 2$

6. $-3 = x - 11$

7. $6x = 24$

8. $5x = -15$

9. $\frac{1}{3}x = 6$

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

11. $3 = -9x$

12. $4 = 12x$

13. $-3 = x - 8$

14. $-3x = 12$

15. $6x = 20$

16. $x + \frac{1}{2} = \frac{3}{8}$

17. $\frac{1}{3} + x = \frac{5}{6}$

18. $x - \frac{3}{4} = \frac{1}{12}$

19. $x - \frac{2}{3} = -3$

20. $4x = \frac{1}{3}$

21. $7x = \frac{14}{5}$

22. $5x - 2 = 13$

23. $9 - 3x = -3$

24. $x + 4 = 2x + 9$

Describe the error. Then write the correct steps.

25. ~~$x + 6 = 17$
 $x = 23$~~

26. ~~$x - 12 = 2$
 $x = -10$~~

27. ~~$5x = 10$
 $x = 50$~~

28. ~~$2x + 1 = 7$
 $2x = 8$
 $x = 4$~~

29. ~~$3x - 2 = 7$
 $3x = 9$
 $x = 27$~~

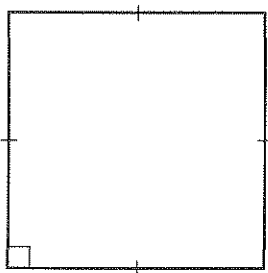
30. ~~$2(x + 3) = 8$
 $2x + 3 = 8$
 $2x = 5$
 $x = \frac{5}{2}$~~

31. ~~$3x - 3 = 2x + 1$
 $5x = 4$
 $x = \frac{4}{5}$~~

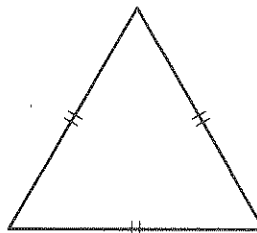
32. ~~$\frac{1}{2}x - 4 = 2$
 $\frac{1}{2}x = 6$
 $x = 3$~~

33. ~~$\frac{3}{2}(2x + 1) = 5$
 $3x + 1 = 5$
 $3x = 4$
 $x = \frac{4}{3}$~~

- 34.
- Perimeter**
- The perimeter of a square is 36 inches. Find its dimensions.



- 35.
- Perimeter**
- An equilateral triangle has sides of equal length. Find the dimensions of an equilateral triangle with a perimeter of 39 inches.



- 36.
- Sales Tax**
- The state sales tax in Pennsylvania is 0.06 (or 6%). If your total bill at the music store included \$1.32 in tax, how much did the merchandise cost?

- 37.
- Movie Tickets**
- A ticket to the movies costs \$7. You have \$21. How many tickets can you buy?

Practice B

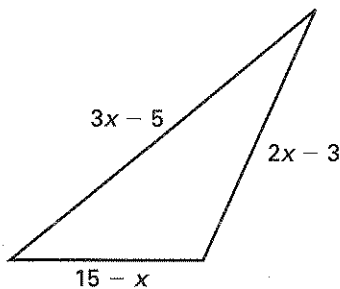
For use with pages 19–24

Solve the equation. Check your solution.

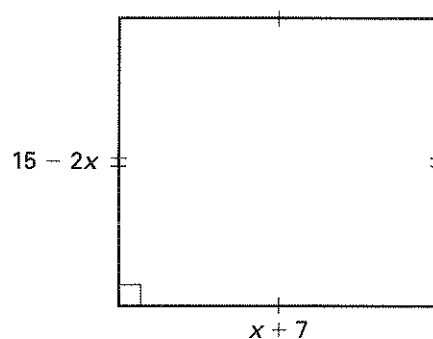
- | | | |
|------------------------------|---|--|
| 1. $x - 8 = 12$ | 2. $2x + 3 = 7$ | 3. $5x - 2 = 13$ |
| 4. $6 - x = 4$ | 5. $9 - 3x = -3$ | 6. $8x + 3 = 5$ |
| 7. $3x - 5 = 9$ | 8. $x + 4 = 2x + 9$ | 9. $3x - 1 = x + 4$ |
| 10. $4 + 5x = x - 8$ | 11. $\frac{1}{2}x + 6 = -4$ | 12. $\frac{2}{3}x - 1 = x + 7$ |
| 13. $-(x + 1) = 2(3x - 1)$ | 14. $3(x - 2) = 5(4 + x)$ | 15. $2(7 - x) = 6(1 + 2x)$ |
| 16. $3(x + 4) = 3(8 - 2x)$ | 17. $\frac{1}{2}(4x + 10) = 5 - 3x$ | 18. $\frac{1}{3}x + 1 = -\frac{1}{3}x - 8$ |
| 19. $\frac{3}{2}(x - 5) = 7$ | 20. $\frac{1}{4}x + 2 = 3 - \frac{3}{4}x$ | 21. $5(2x - 2) = 4 - 2x$ |

Find the dimensions of the figure.

22. The perimeter of the figure is 35 feet.



23. The perimeter of the figure is 38 feet.



24. **Sales Tax** The state sales tax in Pennsylvania is 0.06 (or 6%). If your total bill at the music store included \$1.32 in tax, how much did the merchandise cost?
25. **Movie Tickets** A ticket to the movies costs \$7. You have \$21. How many tickets can you buy?
26. **Weekly Pay** You have a summer job that pays \$5.60 an hour. You get \$8.40 an hour for overtime (anything over 40 hours). How many hours of overtime must you work to earn \$287?
27. **Plumbing Bill** The bill from your plumber was \$134. The cost for labor was \$32 per hour. The cost for materials was \$46. How many hours did the plumber work?
28. **Travel Time** You want to visit your aunt who lives 255 miles away. The interstate is 10 miles from your house and once you get off the interstate, you must travel 14 miles more to get to your aunt's house. If you drive 55 miles per hour on the interstate, how many hours will you travel on the interstate?
29. **Babysitting Rate** You charge \$2 plus \$.50 per child for every hour you babysit. You earn \$3.50 an hour when you watch the Crandell children. How many children are in this family?

Practice C

For use with pages 19–24

Solve the equation. Check your solution.

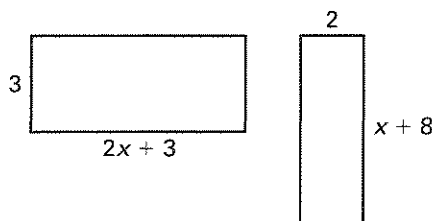
1. $18 = 6x$
2. $3x + 7 = 10$
3. $4x + 1 = x - 8$
4. $3(x + 2) = -2(x + 4)$
5. $-4(3 - x) + 6 = 2(x - 3)$
6. $2(x + 1) = 4 - 3(2x + 1)$
7. $3(1 - x) - (3 + x) = 8$
8. $2(x + 1) - 3(x + 7) = 2$
9. $6(2x - 1) + 3 = 6(2 - x) - 1$
10. $\frac{3}{4}(2x + 8) = 5 - x$
11. $\frac{1}{5}(\frac{5}{2}x - 10) = 4(x + 3)$
12. $-3.6x + 3.1 = 3(5.2 - 1.2x)$
13. $\frac{2}{3}(3x + \frac{6}{5}) = \frac{1}{5}(5x - 1)$
14. $5x - 2(3 - x) = -(4 - x)$
15. $1.5(4x - 2) = 2(0.5x - 3.5)$

Determine whether the following equations have no solution or are identities.

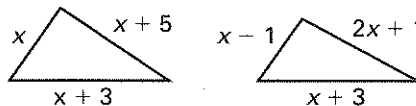
16. $3x + 2 = 3(5 + x)$
17. $5x + 2 = 2(2x + 1) + x$
18. $6x + 2 - 4x = 3(2x + 1) - 2(2x + \frac{1}{2})$
19. $-5(2x + 3) = 2(4 - 3x) - 4x$

Find the dimensions of the figures.

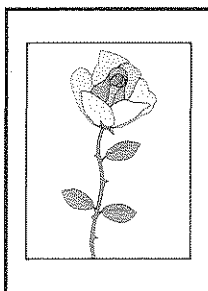
20. The two rectangles shown have the same area.



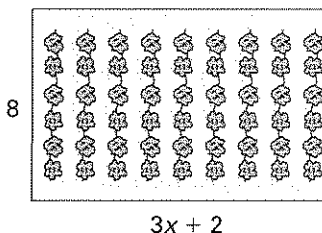
21. The two triangles shown have the same perimeter.



22. **Photo Frame** You want to mat and frame a 5×7 photograph. The perimeter of the outside of the mat is 44 inches. The mat is twice as wide at the top and bottom as it is at the sides. Find the dimensions of the mat.



23. **Garden Fencing** Your garden has an area of 136 square feet. You want to put a fence around the entire garden. How much fencing do you need?



Reteaching with Practice

For use with pages 19–24

GOAL

Solve linear equations and use linear equations to answer questions about real-life situations

VOCABULARYAn **equation** is a statement in which two expressions are equal.A **linear equation** in one variable is an expression that can be written in the form $ax = b$ where a and b are constants and $a \neq 0$.A number is a **solution** of an equation if the statement is true when the number is substituted for the variable.Two equations are **equivalent** if they have the same solutions.**EXAMPLE 1****Variable on One Side**Solve $-19 = -2y + 5$.**SOLUTION**

$$-19 = -2y + 5 \quad \text{Write original equation.}$$

$$-24 = -2y \quad \text{To isolate } y, \text{ subtract 5 from each side.}$$

$$12 = y \quad \text{Divide each side by } -2.$$

Exercises for Example 1

Solve the equation.

1. $3 = -x - 2$

2. $-18 = y + 6$

3. $9 - z = 5$

4. $6 + 6x = -12$

5. $2x - 5 = 1$

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

EXAMPLE 2**Variable on Both Sides**Solve $4x - 2x = 15 - 3x$.**SOLUTION**

$$4x - 2x = 15 - 3x \quad \text{Write original equation.}$$

$$2x = 15 - 3x \quad \text{Combine like terms.}$$

$$5x = 15 \quad \text{To collect the variable terms, add } 3x \text{ to each side.}$$

$$x = 3 \quad \text{Divide each side by 5.}$$

Exercises for Example 2

Solve the equation.

7. $15 - 3a = -4a + 16$

8. $-3m + 6 = 24m + 6$

9. $4s - 6 = 7s + 3$

10. $8t - t + 1 = 10 - 2t$

11. $x - 4 = 2x + 7$

12. $4x = 24 + 16x$

Reteaching with Practice

For use with pages 19–24

EXAMPLE 3 *Using the Distributive Property*Solve $15(4 - y) = 5(10 + 2y)$.**SOLUTION**

$15(4 - y) = 5(10 + 2y)$	Write original equation.
$60 - 15y = 50 + 10y$	Distributive property
$60 = 50 + 25y$	To collect the variable terms, add 15y to each side.
$10 = 25y$	Subtract 50 from each side.
$\frac{2}{5} = y$	Divide each side by 25.

Exercises for Example 3

Solve the equation.

13. $5(x - 3) + 12 = -2(x - 2)$ 14. $-4(k - 2) + 3(k + 1) = 7$
 15. $-2x = 2(x + 1)$ 16. $3x - 9 = 2(x - 5)$

EXAMPLE 4 *Solving an Equation with Fractions*Solve $\frac{2}{3}x + \frac{3}{5} = \frac{4}{15}$.**SOLUTION**

$\frac{2}{3}x + \frac{3}{5} = \frac{4}{15}$	Write original equation.
$15(\frac{2}{3}x + \frac{3}{5}) = 15(\frac{4}{15})$	Multiply each side by the LCD, 15.
$10x + 9 = 4$	Distributive property
$10x = -5$	To isolate x , subtract 9 from each side.
$x = -\frac{1}{2}$	Divide each side by 10.

Exercises for Example 4

Solve the equation.

17. $6n = \frac{2}{3}(5n - 2)$ 18. $\frac{3}{4}x + 1 = 4$
 19. $\frac{1}{2}x - \frac{2}{3} = 4x$ 20. $\frac{3}{5}x = \frac{2}{3}x + 1$

LESSON
1.3

NAME _____ DATE _____

Quick Catch-Up for Absent Students

For use with pages 19–25

The items checked below were covered in class on (date missed) _____

Lesson 1.3: Solving Linear Equations

___ **Goal 1:** Solve linear equations. (pp. 19–20)

Material Covered:

- ___ Example 1: Solving an Equation with a Variable on One Side
- ___ Example 2: Solving an Equation with a Variable on Both Sides
- ___ Example 3: Using the Distributive Property
- ___ Student Help: Skills Review
- ___ Example 4: Solving an Equation with Fractions

Vocabulary:

- equation, p. 19
- linear equation in one variable, p. 19
- solution of an equation, p. 19
- equivalent equations, p. 19

___ **Goal 2:** Use linear equations to solve real-life problems. (p. 21)

Material Covered:

- ___ Example 5: Writing and Using a Linear Equation
- ___ Example 6: Writing and Using a Geometric Formula

Activity 1.3: Using Tables to Solve Equations (p. 25)

___ **Goal:** Solve linear equations using the *Table* feature of a graphing calculator.

- ___ Student Help: Keystroke Help
- ___ Student Help: Study Tip

___ Other (specify) _____

Homework and Additional Learning Support

- ___ Textbook (specify) pp. 22–24 _____

- ___ Internet: Extra Examples at www.mcdougallittell.com
- ___ *Reteaching with Practice* worksheet (specify exercises) _____
- ___ *Personal Student Tutor* for Lesson 1.3

Lesson 1.3

Real-Life Application: When Will I Ever Use This?

For use with pages 19–24

Going Home

Your school is $18\frac{3}{4}$ miles south of Pittsburgh and your house is $44\frac{1}{4}$ miles south of Pittsburgh. You leave your school at 5:00 P.M., traveling south by bicycle at an average speed of 15 miles per hour. Your father leaves Pittsburgh in a car at 5:45 P.M. He is driving south at an average speed of 55 miles per hour. Let t represent the time it takes your father to drive from Pittsburgh toward your house.

1. Find the time it would take you to ride your bicycle home.
2. Find the time your father will arrive home.
3. Write an equation to find your distance d_1 from Pittsburgh after t hours.
4. Write an equation to find your father's distance d_2 from Pittsburgh after t hours.
5. Use your equations from Exercises 3 and 4 to find how long it takes your father to pass you.
6. Find the number of hours you rode your bicycle when your father passes you.
7. At what time did your father pass you on your bicycle?
8. How many miles did you ride your bicycle when your father passed you?
9. You want to arrive home before your father. Assume that all other information stays the same. What time should you leave school?

Challenge: Skills and Applications

For use with pages 19–24

In Exercises 1–4, solve the equation for x in terms of the other variables.

1. $ax - b = x + c$

2. $b(x - d) = c(x + d)$

3. $p - \frac{x}{c} = qx + d$

4. $\frac{x}{2b} = \frac{a}{2} + cx - d$

5. A watermelon was originally 98% water, by weight. After being cut open and left for several days, some of the water evaporated, and the melon is now 92% water.

- a. Let w = the original weight of the melon, and x = the amount of water that evaporated. Write an equation involving x and w that models the given situation.
- b. Solve this equation to find out what fraction of the original weight was lost in the evaporation process.

6. In baseball, a player's batting average is

$$\frac{\text{number of hits}}{\text{number of official at-bats}}$$

expressed as a decimal. At the beginning of one game José Ramirez was batting 0.312, and after getting 3 straight hits, his average climbed to 0.318.

- a. Write a linear equation that expresses José's number of hits h in terms of his number of at-bats b , *before* he got the 3 straight hits.
- b. Write another linear equation that expresses the relationship between his number of hits and at-bats after the 3 straight hits.
- c. By substituting the expression for h that you found in part (a) into the equation you found in part (b), find b .
7. a. If you add all the positive integers starting with 1 and continuing through any positive integer n , the sum is given by the expression

$$\frac{n(n + 1)}{2}$$

Use this fact to write an expression, in terms of x and n , for the sum of the positive integers starting with x and continuing through $x + n$.

- b. Use the formula you found in part (a) to answer the following question: If the sum of a positive integer x and the next 10 consecutive positive integers is 319, what is x ?

Lesson Plan2-day lesson (See *Pacing the Chapter*, TE pages 1C–1D)

For use with pages 26–32

GOALS

1. Rewrite equations with more than one variable.
2. Rewrite common formulas.

State/Local Objectives _____

✓ Check the items you wish to use for this lesson.

STARTING OPTIONS

- ____ Homework Check: TE page 22; Answer Transparencies
 ____ Warm-Up or Daily Homework Quiz: TE pages 26 and 24, CRB page 52, or Transparencies

TEACHING OPTIONS

- ____ Motivating the Lesson: TE page 27
 ____ Lesson Opener (Activity): CRB page 53 or Transparencies
 ____ Graphing Calculator Activity with Keystrokes: CRB pages 54–55
 ____ Examples: Day 1: 1–4, SE pages 26–27; Day 2: 5–6, SE page 28
 ____ Extra Examples: Day 1: TE page 27 or Transp.; Day 2: TE page 28 or Transp.
 ____ Closure Question: TE page 28
 ____ Guided Practice: SE page 29 Day 1: Exs. 1–2, 4–9; Day 2: Exs. 3, 10–11

APPLY/HOMEWORK**Homework Assignment**

- ____ Basic Day 1: 12–20 even, 24–26, 31, 33–42; Day 2: 21–23, 32, 43, 44, 47–65 odd
 ____ Average Day 1: 12–28 even, 30, 32–34; Day 2: 25–31 odd, 35–39, 41, 43, 44, 47–65 odd
 ____ Advanced Day 1: 12–28 even, 30, 32–36; Day 2: 21–31 odd, 35–39, 41, 43, 44, 45, 47–65 odd

Reteaching the Lesson

- ____ Practice Masters: CRB pages 56–58 (Level A, Level B, Level C)
 ____ Reteaching with Practice: CRB pages 59–60 or Practice Workbook with Examples
 ____ Personal Student Tutor

Extending the Lesson

- ____ Applications (Interdisciplinary): CRB page 62
 ____ Challenge: SE page 32; CRB page 63 or Internet

ASSESSMENT OPTIONS

- ____ Checkpoint Exercises: Day 1: TE page 27 or Transp.; Day 2: TE page 28 or Transp.
 ____ Daily Homework Quiz (1.4): TE page 32, CRB page 66, or Transparencies
 ____ Standardized Test Practice: SE page 31; TE page 32; STP Workbook; Transparencies

Notes _____

Lesson Plan for Block Scheduling1-day lesson (See *Pacing the Chapter*, TE pages 1C–1D)

For use with pages 26–32

GOALS

1. Rewrite equations with more than one variable.
2. Rewrite common formulas.

State/Local Objectives _____

_____**CHAPTER PACING GUIDE**

Day	Lesson
1	1.1 (all); 1.2 (all)
2	1.3 (all); 1.4 (begin)
3	1.4 (end); 1.5 (all)
4	1.6 (all); 1.7 (all)
5	Review/Assess Ch. 1

✓ Check the items you wish to use for this lesson.

STARTING OPTIONS

- ____ Homework Check: TE page 22; Answer Transparencies
 ____ Warm-Up or Daily Homework Quiz: TE pages 26 and 24,
 CRB page 52, or Transparencies

TEACHING OPTIONS

- ____ Motivating the Lesson: TE page 27
 ____ Lesson Opener (Activity): CRB page 53 or Transparencies
 ____ Graphing Calculator Activity with Keystrokes: CRB pages 54–55
 ____ Examples: Day 2: 1–4, SE pages 26–27; Day 3: 5–6, SE page 28
 ____ Extra Examples: Day 2: TE page 27 or Transp.; Day 3: TE page 28 or Transp.
 ____ Closure Question: TE page 28
 ____ Guided Practice: SE page 29 Day 2: Exs. 1–2, 4–9; Day 3: Exs. 3, 10–11

APPLY/HOMEWORK**Homework Assignment (See also the assignments for Lessons 1.3 and 1.5.)**

- ____ Block Schedule Day 2: 12–28 even, 30, 32–34; Day 3: 25–31 odd, 35–39, 41, 43, 44, 47–65 odd

Reteaching the Lesson

- ____ Practice Masters: CRB pages 56–58 (Level A, Level B, Level C)
 ____ Reteaching with Practice: CRB pages 59–60 or Practice Workbook with Examples
 ____ Personal Student Tutor

Extending the Lesson

- ____ Applications (Interdisciplinary): CRB page 62
 ____ Challenge: SE page 32; CRB page 63 or Internet

ASSESSMENT OPTIONS

- ____ Checkpoint Exercises: Day 2: TE page 27 or Transp.; Day 3: TE page 28 or Transp.
 ____ Daily Homework Quiz (1.4): TE page 32, CRB page 66, or Transparencies
 ____ Standardized Test Practice: SE page 31; TE page 32; STP Workbook; Transparencies

Notes _____

WARM-UP EXERCISES

For use before Lesson 1.4, pages 26–32

Solve the equation.

1. $10x - 14 = 6$

2. $12x + 1.3 = 9x - 8$

3. $\frac{3}{2}x + \frac{2}{3} = \frac{7}{2}x + \frac{1}{6}$

Evaluate the expression for $m = -5$.

4. $18m - 25$

5. $14 - m^2$

DAILY HOMEWORK QUIZ

For use after Lesson 1.3, pages 19–25

Solve the equation. Check your solution.

1. $3n + 11 = -16$

2. $2x - 5 = 4 - 3x$

3. $7(1 - s) = -2(5s + 4) + 6s$

4. $\frac{3}{2}\left(\frac{3}{5} - \frac{3}{4}x\right) = \frac{3}{10}$

5. A triangle with a perimeter of 50 has side lengths $x - 1$, $2x - 3$, and $3x - 6$. What are the side lengths?6. Using the formula $F^\circ = 1.8 C^\circ + 32^\circ$, find the temperature in degrees Celcius of an oven that is 500°F .

Activity Lesson Opener

For use with pages 26–32

SET UP: Work individually.

Each equation on the left was obtained by solving an equation on the right for one of its variables. Match the equations to find things that are fun in the fall.

_____ 1. $y = \frac{2}{3}x - 2$

A $3x - 2y = 6$

_____ 2. $h = \frac{2A}{b}$

B $y = 2(x - 8)$

_____ 3. $b = \frac{2A}{h}$

F $2x - 3y = 6$

_____ 4. $\pi = \frac{A}{r^2}$

I $C = 2\pi r$

_____ 5. $x = \frac{1}{2}y + 8$

L $A = \frac{1}{2}(b_1 + b_2)h$

_____ 6. $x = \frac{2}{3}y + 2$

O $A = \frac{1}{2}bh$

_____ 7. $h = \frac{2A}{b_1 + b_2}$

R $7 = 2(x + y)$

_____ 8. $b_1 = \frac{2A}{h} - b_2$

S $x = xy - 4$

and

T $A = \pi r^2$

_____ 9. $x = \frac{3}{2}y + 3$

_____ 10. $y = \frac{3}{2}x - 3$

_____ 11. $r = \frac{C}{2\pi}$

_____ 12. $x = \frac{7}{2} - y$

_____ 13. $y = \frac{x + 4}{x}$

Graphing Calculator Activity

For use with pages 26–32

GOAL To use an equation with more than one variable.**Activity**

- ① The formula for simple interest is $I = Prt$, where I is interest, P is principal, r is rate, and t is time.
- (a) Find I when $P = \$3000$, $r = 10\%$, and $t = 2$ years.
- (b) Find I when $P = \$3000$, $r = 12\%$, and $t = 3$ years.
- ② If both sides of the equation $I = Prt$ are divided by rt , the resulting equation is $P = \frac{I}{rt}$. Find P when $I = \$600$, $r = 10\%$, and $t = 2$ years.

Exercises

Use a graphing calculator to solve the following problems.

- The formula for simple interest is $I = Prt$.
 - Solve the equation for P and find P when $I = \$240$, $r = 8\%$, and $t = 3$ years.
 - Solve the equation for t and find t when $I = \$360$, $P = \$2000$, and $r = 6\%$.
 - Solve the equation for r and find r when $I = \$540$, $P = \$3000$, and $t = 3$ years.
- The formula for the area of a circle is $A = \pi r^2$.
 - Find A when $r = 5$ inches.
 - Solve the equation for r and find r when $A \approx 132.7$ square feet.
- The formula for the area of a rectangle is $A = lw$, where l is the length and w is the width.
 - Find A when $l = 8.9$ inches and $w = 4.1$ inches.
 - Find A when $l = 6.2$ feet and $w = 5.7$ feet.
- Solve the equation in Exercise 3 for l .
 - Find l when $w = 4.5$ feet and $A = 32.1$ square feet.
 - Find l when $w = 12.8$ miles and $A = 73.9$ square miles.
- The formula for converting Celsius to Fahrenheit is $F = \frac{9}{5}C + 32$, where F is degrees Fahrenheit and C is degrees Celsius.
 - Find F when $C = 10$ degrees.
 - Find C when $F = 72$ degrees.

Graphing Calculator Activity

For use with pages 26–32

TI-82

Activity 1a:

3000 **STO>** **ALPHA** [P] **2nd** [:] ***** 1 0 **STO>**
ALPHA [R] **2nd** [:] 2 **STO>** **ALPHA** [T] **2nd** [:]
ALPHA [P] **ALPHA** [R] **ALPHA** [T] **ENTER**

Activity 1b:

Press **2nd** [ENTRY] to bring up the last entry.
 Edit it with the cursor as follows:

▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ 3 ▶ ▶
 ▶ ▶ ▶ ▶ 2 **ENTER**

Activity 2:

600 **STO>** **ALPHA** [I] **2nd** [:] ***** 1 0 **STO>**
ALPHA [R] **2nd** [:] 2 **STO>** **ALPHA** [T] **2nd** [:]
ALPHA [I] **÷** (**ALPHA** [R] **ALPHA** [T])
ENTER

SHARP EL-9600c

Activity 1a:

3000 **STO** **ALPHA** [P] **ALPHA** [:] ***** 1 0 **STO**
ALPHA [R] **ALPHA** [:] 2 **STO** **ALPHA** [T] **ALPHA** [:]
ALPHA [P] **ALPHA** [R] **ALPHA** [T] **ENTER**

Activity 1b:

Press **2ndF** [ENTRY] to bring up the last entry.
 Edit it with the cursor as follows:

▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ 3 ▶
 ▶ ▶ ▶ ▶ ▶ 2 **ENTER**

Activity 2:

600 **STO** **ALPHA** [I] **ALPHA** [:] ***** 1 0 **STO**
ALPHA [R] **ALPHA** [:] 2 **STO** **ALPHA** [T] **ALPHA** [:]
ALPHA [I] **÷** (**ALPHA** [R] **ALPHA** [T])
ENTER

TI-83

Activity 1a:

3000 **STO>** **ALPHA** [P] **ALPHA** [:] ***** 1 0 **STO>**
ALPHA [R] **ALPHA** [:] 2 **STO>** **ALPHA** [T] **ALPHA** [:]
ALPHA [P] **ALPHA** [R] **ALPHA** [T] **ENTER**

Activity 1b:

Press **2nd** [ENTRY] to bring up the last entry.
 Edit it with the cursor as follows:

▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ 3 ▶ ▶
 ▶ ▶ ▶ ▶ ▶ 2 **ENTER**

Activity 2:

600 **STO>** **ALPHA** [I] **ALPHA** [:] ***** 1 0 **STO>**
ALPHA [R] **ALPHA** [:] 2 **STO>** **ALPHA** [T] **ALPHA** [:]
ALPHA [I] **÷** (**ALPHA** [R] **ALPHA** [T])
ENTER

CASIO CFX-9850GA PLUS

Activity 1a:

3000 **→** **ALPHA** [P] **SHIFT** **F6** **F5**
 .10 **→** **ALPHA** [R] **F5** **ALPHA** [P] **ALPHA** [R]
ALPHA [T] **EXE**

Activity 1b:

◀ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ 3 ▶
 ▶ ▶ ▶ ▶ ▶ ▶ 2 **EXE**

Activity 2:

600 **→** **ALPHA** [I] **F5** .1 **→** **ALPHA** [R]
F5 2 **→** **ALPHA** [T] **F5** **ALPHA** [I] **÷** (**ALPHA** [R]
ALPHA [R] **ALPHA** [T]) **EXE**

Practice A

For use with pages 26–32

Find the value of y for the given value of x by first substituting the value of x into the equation and solving for y .

- | | | |
|----------------------------|-----------------------------|-----------------------------|
| 1. $2x + 3y = 12; x = 3$ | 2. $4x + 5 = 3 - 2y; x = 1$ | 3. $xy + x = -3; x = 3$ |
| 4. $4x - 3xy = 16; x = -2$ | 5. $2y - 5x = 1; x = -5$ | 6. $-x + 3y + 1 = 2; x = 0$ |
| 7. $3x - 7y = 8; x = -2$ | 8. $x = 12 - xy; x = 4$ | 9. $5x + 2y = 8; x = -1$ |

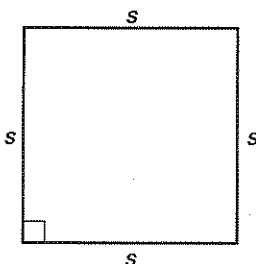
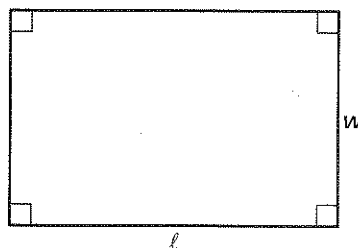
Find the value of y for the given value of x by first solving for y and then substituting the value of x into the equation.

- | | | |
|---|-------------------------------|------------------------------------|
| 10. $3x + 2y = 1; x = 5$ | 11. $y - 2x = 12; x = 3$ | 12. $\frac{1}{2}x + y = 1; x = -6$ |
| 13. $-2x + \frac{1}{3}y + 4 = 0; x = 2$ | 14. $xy - 3x = -4; x = 2$ | 15. $2x + 3xy = 8; x = -2$ |
| 16. $6x - 9y = 9; x = -3$ | 17. $-3x + 7 = 2y + 3; x = 4$ | 18. $8x + 3y = 10; x = 4$ |

Solve the formula for the indicated variable.

19. *Distance*Solve for t : $d = rt$ 21. *Simple Interest*Solve for r : $I = Prt$ 23. *Height of an Equilateral Triangle*Solve for s : $h = \frac{\sqrt{3}}{2}s$ 25. *Area of a Parallelogram*Solve for b : $A = bh$ 27. *Celsius to Fahrenheit*Solve for C : $F = \frac{9}{5}C + 32$ 20. *Distance*Solve for r : $d = rt$ 22. *Simple Interest*Solve for t : $I = Prt$ 24. *Area of a Rectangle*Solve for w : $A = lw$ 26. *Perimeter of an Equilateral Triangle*Solve for s : $P = 3s$ 28. *Area of a Trapezoid*Solve for h : $A = \frac{h}{2}(b_1 + b_2)$

Solve the formula for the indicated variable. Then evaluate the rewritten formula for the given value(s). (Include units of measure in the answer.)

29. *Perimeter of a Square*: $P = 4s$ Solve for s .Find s when $P = 44$ cm.30. *Area of a Rectangle*: $A = lw$ Solve for l .Find l when $A = 24$ ft² and $w = 8$ ft.

Practice B

For use with pages 26–32

Find the value of y for the given value of x by first substituting the value of x into the equation and solving for y .

1. $3x - 7y = 8$; $x = -2$
2. $x = 12 - xy$; $x = 4$
3. $5x + 2y = 8$; $x = -1$
4. $\frac{4}{5}x = \frac{3}{2}y - 4$; $x = 10$
5. $\frac{2}{3}x + \frac{1}{2}y = 6$; $x = 6$
6. $2x + 3y = 1$; $x = -1$

Find the value of y for the given value of x by first solving for y and then substituting the value of x into the equation.

7. $6x - 9y = 9$; $x = -3$
8. $-3x + 7 = 2y + 3$; $x = 4$
9. $8x + 3y = 10$; $x = 4$
10. $2 + xy = 5x$; $x = -1$
11. $\frac{3}{4}x + \frac{4}{7}y = -6$; $x = 8$
12. $\frac{3}{5}x - \frac{2}{9}y = -13$; $x = 15$

Solve the formula for the indicated variable.

13. Height of an Equilateral Triangle

Solve for s : $h = \frac{\sqrt{3}}{2}s$

14. Perimeter of an Equilateral Triangle

Solve for s : $P = 3s$

15. Volume of a Right Circular Cone

Solve for h : $V = \frac{\pi r^2 h}{3}$

16. Celsius to Fahrenheit

Solve for C : $F = \frac{9}{5}C + 32$

17. Area of a Trapezoid

Solve for h : $A = \frac{h}{2}(b_1 + b_2)$

18. Area of a Trapezoid

Solve for b_2 : $A = \frac{h}{2}(b_1 + b_2)$

19. Lateral Surface Area of a Right Circular Cylinder

Solve for r : $S = 2\pi rh$

20. Volume of a Right Circular Cylinder

Solve for h : $V = \pi r^2 h$

Solve the formula for the indicated variable. Then evaluate the rewritten formula for the given value(s). (Include units of measure in the answer.)

21. Perimeter of a Square: $P = 4s$

Solve for s .

Find s when $P = 44$ cm.

22. Area of a Rectangle: $A = lw$

Solve for l .

Find l when $A = 24$ ft² and $w = 8$ ft.

Hot Air Balloons In 1794, the French Army sent soldiers up in hot air balloons to observe enemy troop movements. One such balloon, the L'Entrepenant, had a volume of $\frac{256\pi}{3}$ cubic meters.

23. Solve the formula for the volume of a sphere ($V = \frac{4}{3}\pi r^3$) for r^3 . Then use this formula to calculate the radius of the L'Entrepenant balloon.

24. What was the diameter of the L'Entrepenant balloon?

25. Use the formula for surface area of a sphere ($S = 4\pi r^2$) to approximate the surface area of the L'Entrepenant balloon.

Practice C

For use with pages 26–32

Find the value of y for the given x by first substituting the value of x into the equation and solving for y .

1. $xy + 3x = 6; x = 2$

2. $5x + 2y - 13 = x; x = -3$

3. $y(x + 3) + 2x = 1; x = 4$

4. $y(2x - 1) = 5; x = 3$

5. $6x - y(3 + x) = 7; x = -2$

6. $y(x + 2) = 7(x - 3) + 1; x = 1$

Find the value of y for the given x by first solving for y and then substituting the value of x into the equation.

7. $4x - 3xy = 5; x = 1$

8. $\frac{2}{3}x + \frac{1}{5}y = \frac{1}{3}; x = 2$

9. $y(x + 3) = 5; x = 7$

10. $y(2x + 1) - 3x = 8; x = 2$

11. $y(3x - 1) = 4(x + 2) - 1; x = 2$

12. $y(4 - 3x) + 2(x + 1) = 9; x = 3$

Solve the formula for the indicated variable.

13. *Area of a Trapezoid*

Solve for b_1 : $A = \frac{h}{2}(b_1 + b_2)$

14. *Lateral Surface Area of a Frustum of a Right Circular Cone*

Solve for R : $S = \pi s(R + r)$

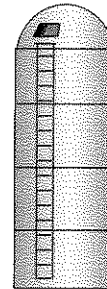
Fundraising The high school girls softball team is holding a car wash to raise money for new uniforms. At the car wash they offer a regular wash for \$7 and a wash and wax for \$15.

- Write an equation that represents the total amount of money they earned.
- How many variables are in the equation? What do they represent?
- The softball team earned \$365. If they washed and waxed 8 cars, how many customers only wanted a wash?

Silo The silo pictured at the right is a cylinder with half of a sphere on top. The silo can hold 576π cubic feet of grain. The radius of the sphere is 6 feet.

- Given that the volume of a cylinder is $V = \pi r^2 h$ and the volume of a sphere is $V = \frac{4}{3} \pi r^3$, write a formula for the volume of the silo.

- Solve the formula you found in Exercise 18 for h .
- Find the height of the silo.



Reteaching with Practice

For use with pages 26–32

GOAL

Rewrite equations and common formulas with more than one variable

EXAMPLE 1**Calculating the Value of a Variable**Given the equation $-y + 2x = -10$, find the value of y when $x = -4$.**SOLUTION:** Method 1

$-y + 2x = -10$	Write original equation.
$-y + 2(-4) = -10$	Substitute -4 for x .
$-y - 8 = -10$	Simplify.
$-y = -2$	To isolate y , add 8 to each side.
$y = 2$	Divide each side by -1 .

SOLUTION: Method 2

$-y + 2x = -10$	Write original equation.
$-y = -10 - 2x$	To isolate y , subtract $2x$ from each side.
$y = 10 + 2x$	Divide each side by -1 .
$y = 10 + 2(-4)$	Substitute -4 for x .
$y = 2$	Simplify.

Exercises for Example 1Find the value of y for the given value of x .

- $-xy + 2x = 20$; $x = 5$
- $4x - 3y - 10 = 1$; $x = -1$
- $5x + 7y = -1$; $x = 4$
- $x = 6 + xy$; $x = -3$

EXAMPLE 2**Using an Equation with More than One Variable**

The formula for calculating the selling price is $S = L - rL$, where L is the list price and r is the rate of discount. An automatic coffee maker is advertised to sell for \$53.55, which is a 15% discount. Calculate the list price.

Reteaching with Practice

For use with pages 26–32

SOLUTION

$$S = L - rL \quad \text{Formula for selling price.}$$

$$S = L(1 - r) \quad \text{Factor } L \text{ out of the terms on the right.}$$

$$\frac{S}{1 - r} = L \quad \text{Divide each side by } 1 - r.$$

$$\frac{53.55}{1 - 0.15} = L \quad \text{Substitute 53.55 for } S \text{ and 0.15 for } r.$$

$$63 = L \quad \text{Simplify.}$$

The list price for the coffee maker is \$63.

Exercises for Example 2

- The cost is $c = 5000 + 0.56x$ where x is the number of items produced. Solve the equation for x , then evaluate x when $c = 8360$.
- At a delicatessen, ham costs \$2.49 per pound and Swiss cheese costs \$3.79 per pound. The customer has \$9.50 to spend on 2 pounds of ham and some cheese. How much cheese can she purchase? Write an equation and solve it.

EXAMPLE 3**Rewriting a Common Formula**

The formula for converting from Celsius to Fahrenheit is $F = \frac{9}{5}C + 32$.
Solve for C .

SOLUTION

$$F = \frac{9}{5}C + 32 \quad \text{Formula for conversion from Celsius to Fahrenheit}$$

$$F - 32 = \frac{9}{5}C \quad \text{To isolate } C, \text{ subtract 32 from each side.}$$

$$\frac{5}{9}(F - 32) = C \quad \text{Multiply each side by } \frac{5}{9}.$$

Exercises for Example 3**Solve for the indicated variable.**

- Solve for r : $A = 2\pi rh$
- Solve for w : $V = lwh$
- Solve for b : $\frac{b}{h} = \frac{3}{4}$
- Solve for t : $A = P + Prt$
- Solve for h : $V = \frac{1}{3}b^2h$
- Solve for x : $p = 12 - \frac{x}{1000}$

Quick Catch-Up for Absent Students

For use with pages 26–32

The items checked below were covered in class on (date missed) _____

Lesson 1.4: Rewriting Equations and Formulas___ **Goal 1:** Rewrite equations with more than one variable. (pp. 26–27)**Material Covered:**

___ Example 1: Rewriting an Equation with More Than One Variable

___ Activity: Equations with More Than One Variable

___ Example 2: Calculating the Value of a Variable

___ Example 3: Writing an Equation with More Than One Variable

___ Example 4: Using an Equation with More Than One Variable

___ **Goal 2:** Rewrite common formulas. (p. 28)**Material Covered:**

___ Student Help: Skills Review

___ Example 5: Rewriting a Common Formula

___ Example 6: Applying a Common Formula

___ Other (specify) _____

Homework and Additional Learning Support

___ Textbook (specify) pp. 29–32 _____

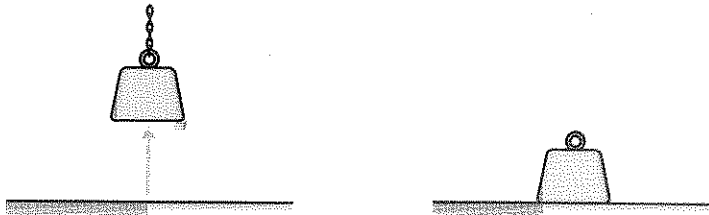
___ *Reteaching with Practice* worksheet (specify exercises) ________ *Personal Student Tutor* for Lesson 1.4

Interdisciplinary Application

For use with pages 26–32

Work

PHYSICAL SCIENCE Work is commonly thought of as the accomplishment of some task or job. For instance, if you are holding a heavy object stationary to prevent it from falling, you may think you are doing work. However, work is accomplished only when a force acts through a distance. (See the diagrams below.)



Work being done.

Work, *not* being done.

So, work is defined as the product of the magnitude of the force and the parallel distance through which the force acts. The standard unit for work is the newton-meter, or joule (abbreviated J). The joule is named in honor of the early English scientist James Prescott Joule. One joule is the amount of work done by a force of 1 newton with a distance of 1 meter.

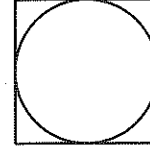
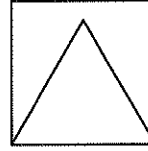
1. Use the information described above to write the verbal model for the definition of work.
2. Assign labels to your verbal model.
3. Write the algebraic model for the definition of work.
4. You use a force of 20 newtons to move a box of textbooks 0.50 meter on a level surface. Find the amount of work that is being done.
5. You use a force of 20 newtons to move the same box of textbooks 250 centimeters on a level surface. Find the amount of work that is being done.
6. You and a friend use a combined force of 45 newtons to move a box of textbooks 1.5 meters on a level surface. Find the amount of work that is being done.
7. Rewrite your formula to solve for distance. Check your algebraic formula with unit analysis.
8. Use your algebraic model from Exercise 7 to find the distance a box is moved when the amount of work done is 68.75 joules and the force is 25 newtons.

Challenge: Skills and Applications

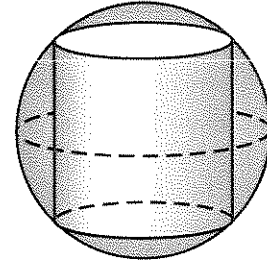
For use with pages 26–32

1. Solve the equation $(x - 3)y + 7 = (x - 1)y - 5$ for y . Can you solve this equation for x ? For which value(s) of x is the equation true?

2. a. The first diagram shows an equilateral triangle and a square with the same side length s . Find the area of the triangle A_T in terms of the area of the square A_S .



- b. The second diagram shows a circle with the same diameter as the length of a side of the square. Find the area of the circle A_C in terms of A_S .
- c. Use parts (a) and (b) to express the area of the circle A_C in terms of the area of the triangle A_T .
3. The sphere shown at the right has radius R . Suppose a cylinder of height h is inscribed in the sphere, as shown. Find the volume V of the cylinder in terms of R and h only.



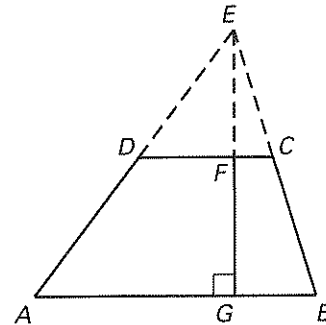
4. This exercise shows one way of deriving the formula for the area of a trapezoid from the formula for the area of a triangle. In the diagram at the right, let $AB = b$, $DC = a$, $FG = h$, and $EF = p$.

- a. From similar triangles, we know that $\frac{p}{p+h} = \frac{a}{b}$.

Solve this equation for p .

- b. Write a formula for the area A of the trapezoid by expressing it as the difference between the area of 2 triangles. Leave your answer in terms of p , h , a , and b .

- c. By substituting the expression you found for p in part (a) into the equation you found in part (b), express A in terms of a , b , and h only.



Lesson Plan1-day lesson (See *Pacing the Chapter*, TE pages 1C–1D)

For use with pages 33–40

GOALS

1. Use a general problem-solving plan to solve real-life problems.
2. Use other problem-solving strategies to help solve real-life problems.

State/Local Objectives _____

✓ Check the items you wish to use for this lesson.

STARTING OPTIONS

- ____ Homework Check: TE page 29; Answer Transparencies
 ____ Warm-Up or Daily Homework Quiz: TE pages 33 and 32, CRB page 66, or Transparencies

TEACHING OPTIONS

- ____ Motivating the Lesson: TE page 34
 ____ Lesson Opener (Application): CRB page 67 or Transparencies
 ____ Examples 1–6: SE pages 33–36
 ____ Extra Examples: TE pages 34–36 or Transparencies
 ____ Closure Question: TE page 36
 ____ Guided Practice Exercises: SE page 37

APPLY/HOMEWORK**Homework Assignment**

- ____ Basic 8–18, 28, 29, 31–41 odd; Quiz 2: 1–8
 ____ Average 8–21, 28, 29, 31–41 odd; Quiz 2: 1–8
 ____ Advanced 8–21, 24–30, 31–41 odd; Quiz 2: 1–8

Reteaching the Lesson

- ____ Practice Masters: CRB pages 68–70 (Level A, Level B, Level C)
 ____ Reteaching with Practice: CRB pages 71–72 or Practice Workbook with Examples
 ____ Personal Student Tutor

Extending the Lesson

- ____ Applications (Real-Life): CRB page 74
 ____ Math & History: SE page 40; CRB page 75; Internet
 ____ Challenge: SE page 39; CRB page 76 or Internet

ASSESSMENT OPTIONS

- ____ Checkpoint Exercises: TE pages 34–36 or Transparencies
 ____ Daily Homework Quiz (1.5): TE page 39, CRB page 80, or Transparencies
 ____ Standardized Test Practice: SE page 39; TE page 39; STP Workbook; Transparencies
 ____ Quiz (1.3–1.5): SE page 40; CRB page 77

Notes _____
