

**Chapter
1****Equations**

Dear Family,

The Internet has made more information available to people than ever before. Because much of this information comes from other countries, you are likely to see more metric units of measure than ever before. The dimensions for many products are often given using centimeters (cm) or meters (m). You may find a recipe online that uses milliliters (ml) and grams (g) instead of cups and ounces. How will you convert these measurements to more familiar units?

You may know some ways to approximate some familiar customary units. An inch is about the width of your thumb. A cup of flour fits in two cupped hands. "Room temperature" is about 72° Fahrenheit ($^{\circ}$ F). To develop a way to approximate metric measurements, you will need to convert an unfamiliar unit to a familiar one.

Work with your student to find some analogies for some common metric units. For example, one centimeter (cm) is about four tenths of an inch. A common approximation for a centimeter is the width of the nail on your index finger.

Figure out these analogies with your student:

- Find out what "room temperature" is on the Celsius scale. Normal body temperature is 98.6° F—what is normal body temperature on the Celsius scale?
- A mile is about 12 city blocks. Find out how many city blocks are in a kilometer (km).
- A yard is roughly the distance from your nose to your outstretched fingertips. About how long is a meter?
- About how many grams of flour fit in two cupped hands?

There may be other units you have encountered. By finding common analogies, these new units of measure may become more familiar.

A pinch of understanding is worth a pound of information!

Capítulo**1****Ecuaciones**

Estimada Familia:

La Internet ha hecho posible que hoy más que nunca, las personas tengamos más información disponible. Dado que la mayoría de esta información proviene de otros países, estará viendo más unidades métricas que nunca antes. Las dimensiones de muchos productos a menudo se expresan en centímetros (cm) o metros (m). En Internet podrá encontrar una receta que use mililitros (ml) y gramos (g) en vez de tazas y onzas. ¿Cómo convertiría estas medidas a unidades más conocidas?

Pueda que conozca algunas formas de aproximar algunas unidades conocidas. Una pulgada es aproximadamente el ancho de su pulgar. Una taza de harina cabe en dos manos cóncavas. La "temperatura ambiente" es alrededor de 72° Fahrenheit (°F). Para desarrollar una forma de aproximar las medidas métricas, necesitará convertir una unidad no conocida en una conocida.

Trabaje con su estudiante para hallar algunas analogías para ciertas unidades métricas comunes. Por ejemplo, un centímetro (cm) equivale aproximadamente a cuatro décimas de pulgada. Una aproximación común para un centímetro es el ancho de la uña de su dedo índice.

Averigüe estas analogías con su estudiante:

- Averigüen cuánto es la "temperatura ambiente" en la escala de Celsius. La temperatura normal del cuerpo es 98.6°F—¿cuál es la temperatura normal del cuerpo en la escala de Celsius?
- Una milla es alrededor de 12 cuadras de la ciudad. Averigüen cuántas cuadras de la ciudad equivalen a un kilómetro (km).
- Una yarda es más o menos la distancia desde su nariz hasta las puntas estiradas de sus dedos. Aproximadamente, ¿cuánto será un metro?
- Aproximadamente, ¿cuántos gramos de harina caben en dos manos cóncavas?

Pueda ser que hayan encontrado otras unidades. Al encontrar analogías comunes, estas nuevas unidades de medida se hacen más conocidas.

¡Un poquito de comprensión equivale a una libra de información!

Activity
1.1

Start Thinking!

For use before Activity 1.1

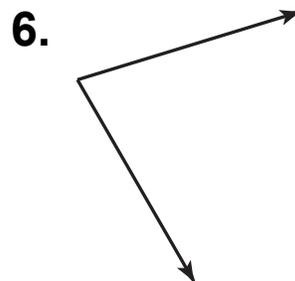
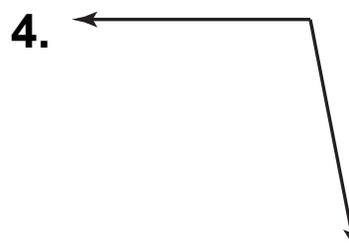
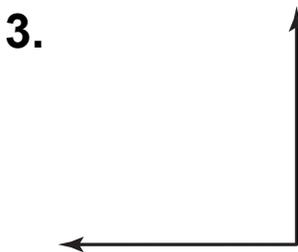
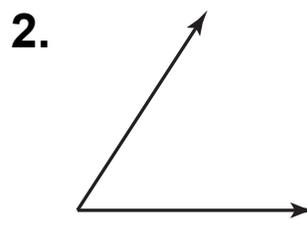
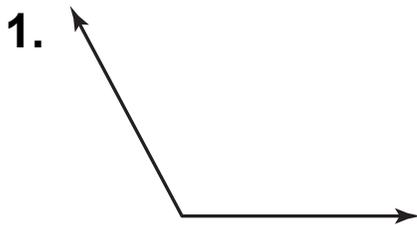
What are some rules in your classroom or school? How are they similar to rules in mathematics?

Activity
1.1

Warm Up

For use before Activity 1.1

Use a protractor to find the measure of the angle.



Lesson
1.1

Start Thinking!

For use before Lesson 1.1

The Addition Property of Equality states that adding the same number to each side of an equation produces an equivalent equation. What do you think the Subtraction, Multiplication, and Division Properties of Equality state?

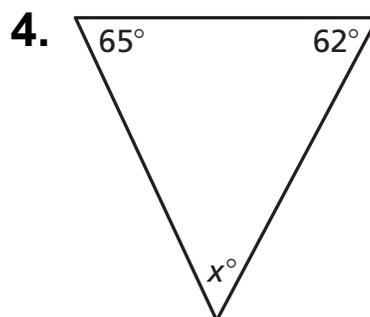
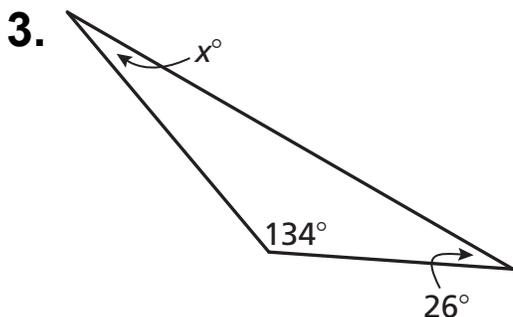
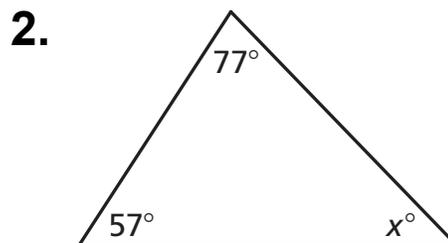
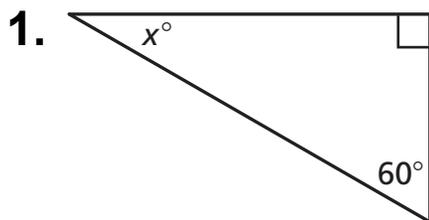
Describe a real-life situation that you can relate to one of the properties of equality.

Lesson
1.1

Warm Up

For use before Lesson 1.1

Find the value of x . Check the reasonableness of your answer.



1.1 Practice A**Solve the equation. Check your solution.**

1. $x + 4 = 11$

2. $n - 14 = 20$

3. $-6 + k = -9$

4. $2\pi + d = 5\pi$

5. $y - 1.4 = -2.7$

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

7. Your school's football team scored 49 points. Your team's score was 19 points more than the opponent's score s . Write and solve an equation to find the opponent's score.

Solve the equation. Check your solution.

8. $5y = 40$

9. $\frac{d}{9} = -2$

10. $1.2 = -3b$

11. $\frac{x}{4.1} = -2$

12. $\frac{2}{5}p = \frac{3}{5}$

13. $-4.5 = -1.2k$

14. You earn \$7.50 per hour to help your uncle in his shop. You earn \$33.75. Write and solve an equation to find how many hours you worked.

Solve the equation. Check your solution.

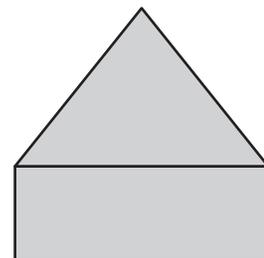
15. $s - |-4| = 7.3$

16. $p + 1.6 \div (-0.4) = -12$

17. Without solving, determine whether the solution of $\frac{1}{3}x = 21$ is *greater than* or *less than* 21. Explain.

18. The volume V of the cylinder is 65π cubic centimeters. The height h of the cylinder is 5 centimeters. Use the formula $V = Bh$ to find the area B of the base of the cylinder.

19. The total area of this shape is 44 square inches. The area of the triangle is 20 square inches. Write and solve an equation to find the area of the rectangle.



1.1 Practice B**Solve the equation. Check your solution.**

1. $-13 + x = -25$

2. $h + 4\pi = 30\pi$

3. $4.5 = m + 2.75$

4. $a - \frac{3}{4} = \frac{2}{3}$

5. $\frac{1}{6} = \frac{5}{12} + p$

6. $c - 2.3 = -5.1$

7. You shopped online and found your MP3 player for \$9.75 less than the store price p . The online price was \$64. Write and solve an equation to find the store price.

Solve the equation. Check your solution.

8. $-1.6x = 8$

9. $\frac{h}{2\pi} = 4.3$

10. $\frac{4}{3} = \frac{2}{15}j$

11. $-23.6 = 5.9t$

12. $6\pi = -2\pi q$

13. $\frac{3}{7}w = -4$

14. The area of a rectangle is 55.8 square inches. The width of the rectangle is 4.5 inches. Write and solve an equation to find the length of the rectangle.

Solve the equation. Check your solution.

15. $5.6 \div 0.4 - r = -8$

16. $n - 5 \cdot \frac{2}{3} = \frac{3}{4}$

17. Write an addition equation and a multiplication equation that each have a solution of -5 .
18. A fruit basket contains oranges and grapefruits. One-third of the oranges and one-fourth of the grapefruits were spoiled. You threw away 4 oranges and 7 grapefruits. How many pieces of fruit were in the basket?
19. You and two friends pay \$40 for tickets. The cost was divided three ways in the ratio 1 : 3 : 6. How much did each person pay?

1.1 Enrichment and Extension

Properties of Equality

There are four properties of equality. These properties are usually used to solve equations. They can also be used to write an equivalent form of a given equation.

Determine which property of equality can be used to transform the first equation into the second equation. Then use the color key to shade the square the appropriate color.

Color Key:

Addition Property of Equality - Yellow

Subtraction Property of Equality - Green

Multiplication Property of Equality - Red

Division Property of Equality - Blue

$2x = 4$ $4x = 8$	$10x = -100$ $x = -10$	$x + 1 = 0$ $x + 6 = 5$	$7 - 2x = -2$ $14 - 2x = 5$	$15x = 45$ $x = 3$	$5x = 10$ $6x = 12$
$9x = 81$ $x = 9$	$x + 5 = 1$ $x + 9 = 5$	$x + 4 = 5$ $x = 1$	$x + 7 = 10$ $x + 2 = 5$	$x = 8$ $x + 2 = 10$	$2.2x = 22$ $x = 10$
$x = 0$ $x + 2 = 2$	$x + 3 = 3$ $x = 0$	$3x = 11$ $-3x = -11$	$12.5x = 7$ $25x = 14$	$x + 2 = 19$ $x = 17$	$3 - x = -4$ $5 - x = -2$
$x + 3 = 6$ $x + 6 = 9$	$x = 2$ $x - 1 = 1$	$4x = 5$ $20x = 25$	$2x = 10$ $5x = 25$	$x - 2 = 14$ $x - 4 = 12$	$x + 1 = 2$ $x + 6 = 7$
$-12x = 60$ $2x = -10$	$2x - 1 = 5$ $2x + 2 = 8$	$x + 13 = 15$ $x + 4 = 6$	$x = 10$ $x - 8 = 2$	$3x + 1 = -4$ $3x + 6 = 1$	$1.5x = 20$ $0.15x = 2$
$-4x = 1$ $16x = -4$	$100x = 50$ $20x = 10$	$x + 1 = 3$ $x + 8 = 10$	$x + 1.5 = 1.7$ $x + 2.8 = 3$	$-14x = 28$ $x = -2$	$x = 3$ $9x = 27$

1. Is it possible to complete the board so that there are no blue squares?
Explain your reasoning.
2. Is it possible to complete the board so that there are no green squares?
Explain your reasoning.



Puzzle Time

Did You Hear About...

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P		

Complete each exercise. Find the answer in the answer column. Write the word under the answer in the box containing the exercise letter.

5 WHO
7.2 HOW
-9 MAN
-13 SOUP
$-\frac{4}{3}$ IT
-14 HE
$\frac{3}{4}$ ARE
$\frac{7}{8}$ IN
42 SOMETHING
4.5 WASH

Solve the equation.

- A. $x + 9 = -12$
- B. $-8 + k = -17$
- C. $-0.3 + r = 4.7$
- D. $f + 3\pi = 12\pi$
- E. $d - 6\pi = -\pi$
- F. $\frac{1}{8} = s - \frac{3}{4}$
- G. $m - \frac{1}{4} = -\frac{1}{3}$
- H. $-0.8b = 10.4$
- I. $46.2 = 4.2p$
- J. $-7\pi h = 98\pi$
- K. $12.5 = \frac{t}{\pi}$
- L. $3.9r = 17.55$
- M. $\frac{3}{8}q = -\frac{1}{2}$
- N. $-\frac{5}{6} = \frac{2}{3}w$
- O. Your dog weighs 28.5 pounds more than your cat. Your dog weighs 37.8 pounds. What is your cat's weight?
- P. Nathaniel's sister has $\frac{5}{6}$ as many songs on her MP3 player as he has on his MP3 player. His sister has 35 songs. How many songs does Nathaniel have?

9.3 WITH
5π SOAP
12.5π COULD
8π WAS
$-\frac{1}{12}$ HIS
9π PUT
$-\frac{5}{4}$ DOWN
11 SO
-21 THE
$-\frac{3}{5}$ THAT

Activity
1.2**Start Thinking!**

For use before Activity 1.2

Why do you think it is important to check your answer to a math problem?

Activity
1.2**Warm Up**

For use before Activity 1.2

Simplify the expression.

1. $2n + 5 + 3n$

2. $x - 7 - 4x$

3. $4f + f + 6f$

4. $(9 - m) + 4m + 7$

5. $17 + 2t - 9 + 2t$

6. $(y + 7) + (2y - 5)$

Lesson
1.2

Start Thinking!

For use before Lesson 1.2

Explain why the following situation can be modeled by a multi-step equation.

A plumber charges \$80 per hour for labor plus \$60 for parts.

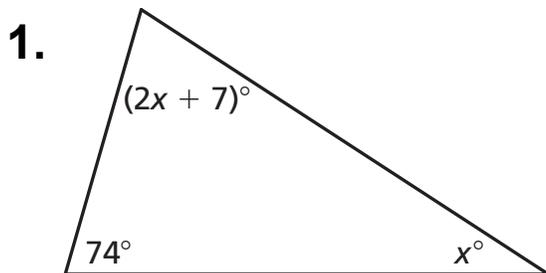
Come up with your own scenario that can be modeled by a multi-step equation.

Lesson
1.2

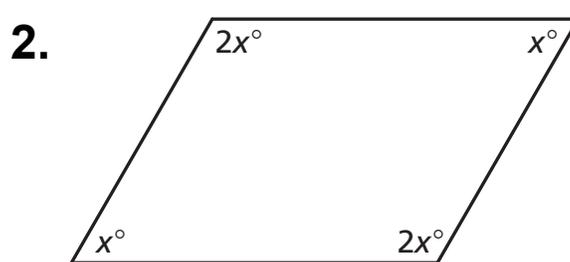
Warm Up

For use before Lesson 1.2

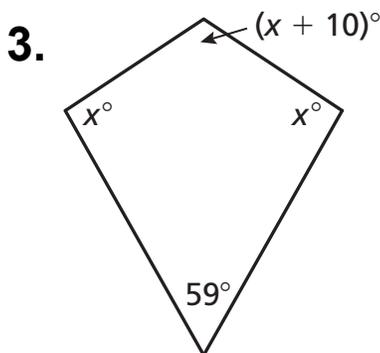
Find the value of x . Then find the angle measures of the polygon. Use a protractor to check the reasonableness of your answer.



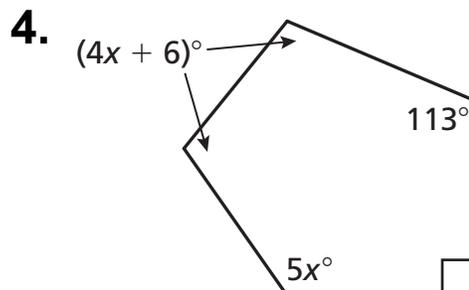
Sum of angle measures: 180°



Sum of angle measures: 360°



Sum of angle measures: 360°



Sum of angle measures: 540°

1.2 Practice A

Solve the equation. Check your solution.

1. $8y - 7 = 9$

2. $14 - 3m = -1$

3. $30 + 2k + 5k = 100$

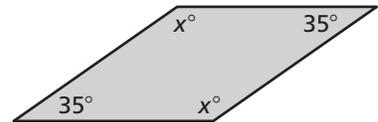
4. $z + (z - 6) - 2 = -10$

5. $3.2x - 1.7x + 5.5 = 10$

6. $\frac{3}{4}x - \frac{1}{4}x + 14 = 3$

7. The cost C (in dollars) of making n feet of cabinet is represented by $C = 18n + 45$. How many feet of cabinet are made when the cost is \$441?

8. The sum of the measures of the interior angles of the parallelogram is 360° . Write and solve an equation to find the value of the variable.



9. At the movies, you order 3 boxes of popcorn and a bottle of water. The cost of the bottle of water is \$1.75. Your total cost is \$9.25. Write and solve an equation to find the cost of one box of popcorn.

10. You and your friend each purchase an equal number n of magazines. Your magazines cost \$1.50 each and your friend's magazines cost \$2 each. The total cost for you and your friend is \$10.50. Write and solve an equation to find the number of magazines you purchased.

11. A rope 25 feet long is cut into 3 pieces. The first piece is $2x$ feet long, the second piece is $5x$ feet long, and the third piece is 4 feet long.

a. Write and solve an equation to find x .

b. Find the lengths of the first and second pieces.

12. The average of your 3 quiz grades is 17 points. Two of your quiz grades are 14 points and 19 points. Write and solve an equation to find the third quiz grade.

13. You had \$26 in your pocket. You purchased x pens at \$3.50 each. You now have \$8.50 in your pocket. Write and solve an equation to find the number of pens purchased.

1.2 Practice B

Solve the equation. Check your solution.

1. $4k - 1.5k = 50$

2. $\frac{5}{7}p - \frac{2}{7}p + 12 = 6$

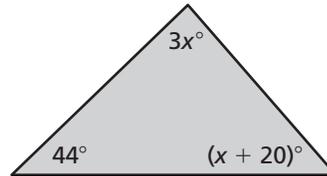
3. $\frac{2}{3}y + y - 4 = 31$

4. $2.1x + 1.3x - 4.6 = 2.2$

5. $3(5 - 2h) + 9 = -30$

6. $14(x - 3) - 22x = -18$

7. The sum of the measures of the interior angles of the triangle is 180° . Write and solve an equation to find the value of the variable.

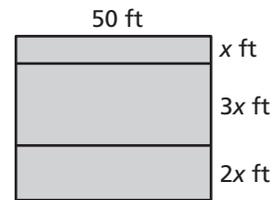


8. A rectangular field has an area of 2100 square feet. The length of the field is 50 feet.

a. How wide is the field?

b. The field is divided into 3 rectangles, as shown. Write and solve an equation to find x .

c. Determine the dimensions of each rectangle.



9. You are researching the price of MP3 players. You found an average price of \$58.80. One MP3 player costs \$56 and another costs \$62. Find the price of the third MP3 player.
10. The perimeter of a triangle is 42 inches. One side measures 18 inches. The shortest side measures x inches. The longest side measures 1 inch less than four times the length of the shortest side. Write and solve an equation to find the length of the longest side.
11. You order 4 fish sandwiches and a hamburger. The cost of the hamburger is \$2.50. Your total bill before tax is \$14.30. Write and solve an equation to find the cost of a fish sandwich.

1.2 Enrichment and Extension

Solving Equations

Work with a partner to design a game board. Cut out each of the cards, fold them in half, and place them in a bag.

Game Rules:

Each player puts a game piece on the start square. The youngest student goes first, selects a card from the bag, and solves the equation on a separate piece of paper. If the answer is positive, the player moves forward that many spaces. If the answer is negative, the player moves backward that many spaces. If there are no spaces to move back, the player loses a turn. If a player suspects his competitor's answer is incorrect, he or she can challenge by solving the equation to check the solution. If a player challenges and wins, he or she moves forward 3 spaces. If a player challenges and loses, he or she forfeits a turn. Place the card back in the bag and it is the next person's turn. The first player to the end square wins.

$$2x - 12 = 8$$

$$\frac{1}{2}x = 3$$

$$2x + 6 = 0$$

$$-14x + 7 = -21$$

$$0.75x + 0.5 = 2$$

$$4x + 2 = 22$$

$$15x + 2 = 62$$

$$-30x = 90$$

$$3x = 21$$

$$x + 10 = 7$$

$$2x - 4 = 10$$

$$\pi x = 6\pi$$

$$4x - 10 = 6$$

$$\frac{3}{4}x - 0.25 = 0.5$$

$$13x - 2x - 3 = 41$$

$$25x - 20 = 5$$

$$-\frac{2}{5}x = -2$$

$$4x - 11x + 32 = 4$$



Puzzle Time

Where Was The Declaration Of Independence Signed?

Circle the letter of each correct answer in the boxes below. The circled letters will spell out the answer to the riddle.

Solve the equation.

1. $8 - 3x = 17$

2. $5a - 6 - 2a = 12$

3. $4.3t - 2.1t - 2.3 = 7.6$

4. $8.1 + 3.8h - 5.6h = -7.2$

5. $\frac{2}{5}c + 4 - \frac{1}{5}c = -9$

6. $2(4s - 16) - 5s = -5$

7. $3g - 6(g - 8) = 42$

8. $1.3(8 - b) + 3.7b = -5.2$

9. For the past three months, Grace used her cell phone for 43 minutes, 62 minutes, and 57 minutes. How many minutes would she have to use her cell phone this month for the average usage over the four months to be 55 minutes?

10. A triangle has one angle measuring $3x$ degrees. A second angle measures $2x + 20$ degrees and the third angle measures $4x - 20$ degrees. What is the value of x ?

11. You and a friend buy two fruit smoothies and leave a tip. You split the total and your half comes to \$3.60. What percent tip (in decimal form) did you and your friend leave if the fruit smoothies cost \$3 each?

A	M	T	E	S	R	T	I	H	P	E	D	G	B	Y
2	60	6	8.2	0.10	5	9	0.18	8.5	55	-3	10.5	-2	0.15	-62
F	B	I	R	O	H	T	C	U	T	N	O	L	M	S
9.5	0.20	3	10	-65	15	58	90	8	20	-55	4.5	68	-6.5	12.5

**Activity
1.3****Start Thinking!**

For use before Activity 1.3

Study the equation below.

$$\boxed{?} \boxed{?} \textcircled{1} = \boxed{?} \textcircled{1} \textcircled{1}$$

The same number of 1-chips are in each box with a question mark. How many chips are in each box?

**Activity
1.3****Warm Up**

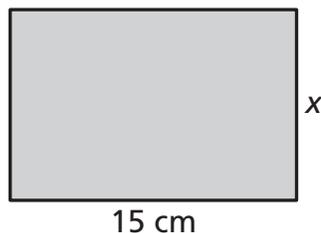
For use before Activity 1.3

Find the width of the rectangle.

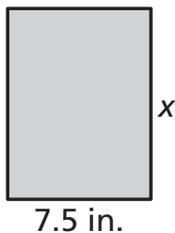
1. Area = 32 m^2



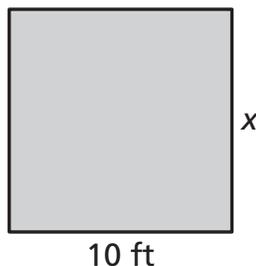
2. Area = 150 cm^2



3. Perimeter = 35 in.



4. Perimeter = 40 ft



Lesson
1.3

Start Thinking!

For use before Lesson 1.3

Try solving the equation $2x + 20 = 12x$ by first subtracting 20 from each side. What property allows you to do so? Does it help you get closer to finding a solution?

What is a better first step? Explain.

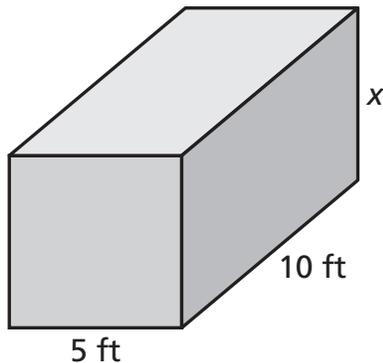
Lesson
1.3

Warm Up

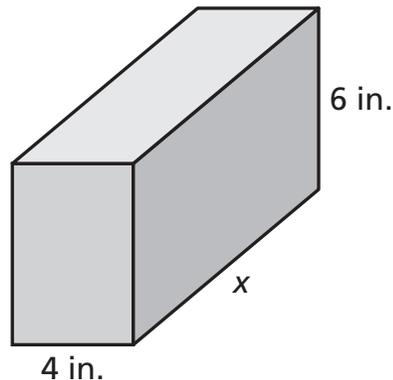
For use before Lesson 1.3

The value of the solid's surface area is equal to the value of the solid's volume. Find the value of x .

1.

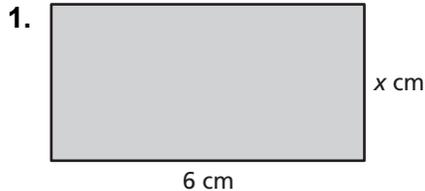


2.



1.3 Practice A

The value of the perimeter of the figure is equal to the value of the area.
Find the value of x .



Solve the equation. Check your solution.

3. $y - 12 = 4y$

4. $6n - 12 = n + 3$

5. $\frac{1}{5}q = 9 - \frac{2}{5}q$

6. $4.3d + 7.5 = 5.8d$

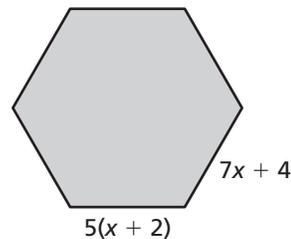
7. $6(h + 4) = -2h$

8. $3(b - 4) = 5b - 2$

9. Your long distance telephone provider offers two plans. Plan A has a monthly fee of \$15 and \$0.25 per minute. Plan B has a monthly fee of \$20 and \$0.05 per minute. Write and solve an equation to find the number of minutes that you must talk to have the same cost for each of the plans.

10. One-third of a number x is equal to 22 less than the number. Write and solve an equation to find the number.

11. Find the perimeter of the regular polygon.



12. You purchase a desk for 60% of the original price p . This price is \$32 less than the original price. Write and solve an equation to find the original price of the desk.

Solve the equation.

13. $8x + 3 = 8x$

14. $-25(10 - x) = 25x + 250$

15. $x + 1 = x + 1$

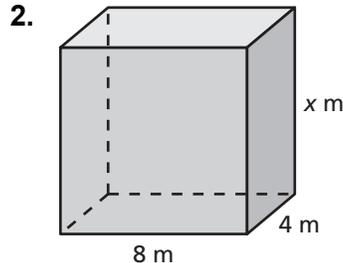
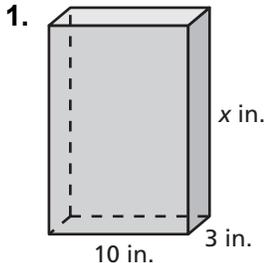
16. $6(2x + 4) = 4(3x + 6)$

17. $x + 2 = 5x$

18. $5x + 2 - x = -4x$

1.3 Practice B

The value of the solid's surface area is equal to the value of the solid's volume. Find the value of x .



Solve the equation. Check your solution.

3. $5y - 14 = 2y - 2$

4. $\frac{4}{7}m = 18 - \frac{2}{7}m$

5. $16(p - 2) = 7p + 4$

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

7. $0.3(t - 2) = 0.4t$

8. $\frac{2}{9}n + \frac{1}{2} = \frac{2}{3}(n + 3)$

9. Describe and correct the error in solving the equation.

✗	$0.4x = 0.2(x - 8)$ $0.4x = 0.2x - 8$ $0.2x = -8$ $x = -40$
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Solve the equation.

10. $4.2x - 3 = 0.5(8.4x + 6)$

11. $\frac{2}{3}x + 1 = \frac{2}{3}x - 1$

12. $1.5(6 - 2x) = 3x - 9$

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

14. $-3(x + 5) = -(3x + 15)$

15. $-\frac{1}{2}x + 1\frac{1}{2} = \frac{1}{2}(3 - x)$

16. The original price p for a necklace is the same at both jewelry stores. At Store A, the sale price is 60% of the original price. Last month, at Store B the sale price was \$40 less than the original price. This month, Store B is selling the necklace for 80% of last month's reduced price. The current sale prices are the same for both stores. Write and solve an equation to find the original price of the necklace.

1.3 Enrichment and Extension

Where can you buy a ruler that is three feet long?

Solve the equations. Order the solutions from least to greatest. Once ordered, the variables will spell the answer to the riddle.

1. $5d - 4 = 4 - d$

2. $-10e + 15 = 95 - 30e$

3. $15t + 17 = 13t + 14$

4. $-12 - a = 4a - 7$

5. $4a - 16 = a - 15$

6. $4y + 12 = 6y + 12$

7. $0.25r - 0.25 + 0.25r = 0.5 - 0.25r$

8. $-4a + 7 = a + 32$

9. $13s - 31 = 2s - 9$

10. $a + 1.25 = 2a - 1$

11. $3\ell + 4 + \ell = 13 + \ell$

Solution													
Variable													

1.3 Puzzle Time

What Happens When A Frog Double-Parks On A Lily Pad?

Write the letter of each answer in the box containing the exercise number.

Solve the equation.

1. $x + 36 = 4x$

2. $6a + 12 = 2(3a - 8)$

3. $\frac{3}{2}p - 14 = p + 13$

4. $7 - 4.9t = 15 + 7.6t$

5. $\frac{1}{3}(12f - 3) = 4f - 1$

6. $\frac{1}{3}(b + 6) = \frac{1}{4}b + 8$

7. $\frac{3}{5}(2m - 10) = \frac{2}{3}m + 10$

8. $8.2(s + 4) = 6.7s + 5.2$

9. On Monday, you run on a treadmill for $\frac{1}{2}$ hour at x miles per hour. On Tuesday, you walk the same distance on the treadmill, at 2 miles per hour slower, and it takes you $\frac{3}{4}$ hour. How many miles did you run on the treadmill on Monday?

10. Jess spent $7x$ minutes on the computer. Her sister spent $5x + 10$ minutes on the computer, which was the same amount of time Jess spent. How many minutes was Jess on the computer?

11. A rectangle is 6 units wide and $x - 8$ units long. It has the same area as a triangle with a height of 7 units and a base of $x - 3$ units. What is the area of the rectangle?

Answers

Y. 72

A. -18.4

T. 42

O. no solution

A. 35

S. 54

A. 12

D. -0.64

W. 3

I. infinitely many solutions

T. 30

5	7		3		11	2	10	4		8	9	1	6
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Activity
1.4

Start Thinking!

For use before Activity 1.4

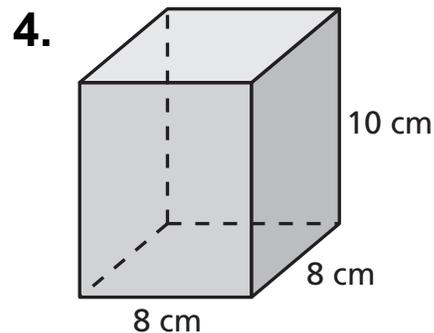
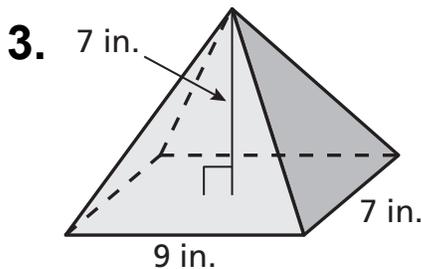
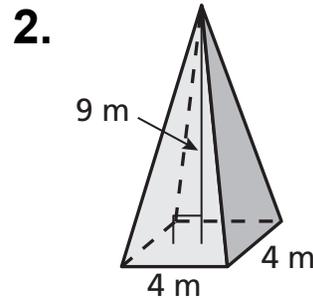
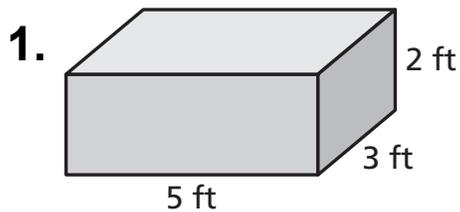
List all of the formulas for area and perimeter (including circumference) that you know. Draw and label a sketch for each shape.

Activity
1.4

Warm Up

For use before Activity 1.4

Find the volume of the solid.



Lesson

1.4

Start Thinking!

For use before Lesson 1.4

How does solving the equation $5x + 4y = 14$ for x compare to solving the equation $5x + 20 = 14$ for x ? Describe the steps involved in each solution.

Lesson

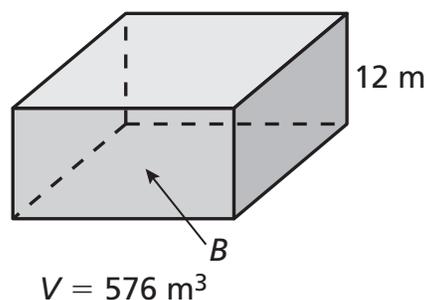
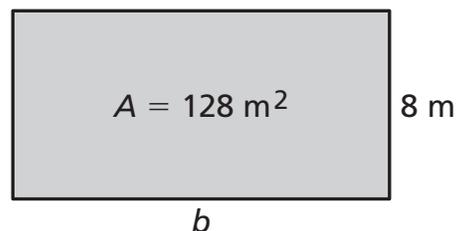
1.4

Warm Up

For use before Lesson 1.4

1.
 - a. Write a formula for the area A of a rectangle.
 - b. Solve the formula for b .
 - c. Use the new formula to find the base of the rectangle.

2.
 - a. Write a formula for the volume V of a prism.
 - b. Solve the formula for B .
 - c. Use the new formula to find the area of the base of the prism.



1.4 Practice A

Solve the equation for y .

1. $\frac{2}{5}x + y = 7$

2. $24 = 4x + 6y$

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

4. $6\pi = x + 2y$

5. The formula $d = 2r$ can be used to find the distance d traveled after 2 hours when driving at rate r .

- Solve the formula for r .
- Find the rate r when the distance traveled is 130 miles.

Solve the equation for the bold variable.

6. $P = \mathbf{R} + C$

7. $p = \frac{\mathbf{X}}{N}$

8. $V = \frac{1}{3}\pi r^2 \mathbf{h}$

9. $A = \frac{1}{2} \mathbf{b}h$

10. The formula for the circumference of a circle with diameter d is $C = \pi d$.

- Solve the formula for d .
- The circumference of a circle is 8 inches. What is the diameter of the circle?
- The circumference of a circle is 6π inches. What is the radius of the circle?

11. The formula for the area of a rhombus with diagonals of lengths c and d is $A = \frac{1}{2}cd$.

- Solve the formula for c .
- The area of a rhombus is 35 square feet. The length of one of the diagonals is 10 feet. What is the length of the other diagonal?
- In a square (which is a rhombus), the lengths of the diagonals are the same. If a square has an area of 32 square feet, then what is the length of each diagonal?

1.4 Practice B

Solve the equation for y .

1. $3x - \frac{1}{4}y = -2$

2. $5x + 8y = 6\pi$

3. $4y - 3.2x = 6$

4. $4.5x - 1.5y = 5.4$

5. The formula for the volume of a rectangular prism is $V = \ell wh$.a. Solve the formula for w .b. Use the new formula to find the value of w when $V = 210$ cubic feet, $\ell = 10$ feet, and $h = 3$ feet.

Solve the equation for the bold variable.

6. $T = hP + 2\mathbf{B}$

7. $C = 1000 + 80\mathbf{x}$

8. $S = \pi r^2 + 2\pi r\mathbf{h}$

9. $A = \frac{1}{2}\mathbf{P}a$

10. The formula $F = \frac{9}{5}C + 32$ converts temperatures from Celsius C to Fahrenheit F .a. Solve the formula for C .b. The boiling point of water is 212°F . What is the temperature in Celsius?c. If a house thermostat is set at 80°F , what is the setting in Celsius? Round your answer to the nearest tenth.11. The formula for the area of a sector of a circle is $A = \frac{m}{360}\pi r^2$, given the measure m of the angle and the radius r of the circle.a. Solve the formula for m .

b. Find the measure of the angle when the area of the sector is 5 square centimeters and the radius is 2 centimeters. Round your answer to the nearest tenth.

c. If the area of the sector in part (b) is greater than 5 square centimeters, is the measure of the angle *greater than* or *less than* the answer to part (b)? Explain.

1.4 Enrichment and Extension

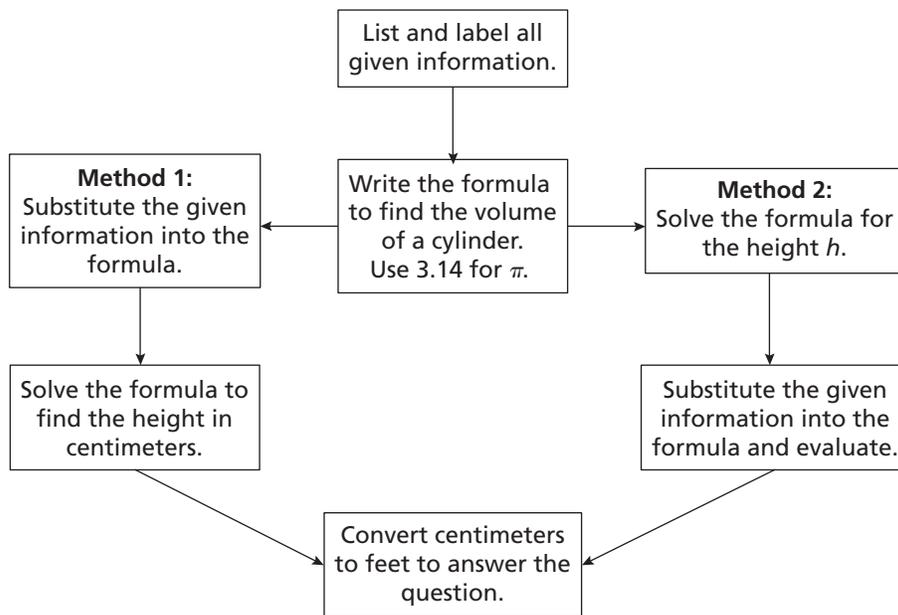
Rewriting Formulas

Neon is a gas that is used in signs. Neon is usually transported in large cylindrical tanks from laboratories to manufacturers.

The volume of neon is measured in cubic centimeters. A laboratory wishes to transport 22,222.22 cubic centimeters of neon using a cylindrical tank. The tank is 15 centimeters in diameter.

The formula for the volume of a cylinder is $V = \pi r^2 h$. In feet, how tall will the tank need to be in order to accommodate the volume of the gas? Round your answer to the nearest hundredth.

There are two methods that can be used to solve this problem. Complete each of the methods and answer the questions.



1. What is your solution using Method 1? What is your solution using Method 2?
2. Which method do you prefer? Why? Explain your reasoning.



1.4 Puzzle Time

What Can't Walk, But Can Run?

Write the letter of each answer in the box containing the exercise number.

Solve the equation for y .

1. $16 - 12x = 4y$

A. $y = -3x + 4$

B. $y = 3x + 4$

C. $y = 3x - 4$

2. $2x + \frac{6}{5} = 2y$

D. $y = 2x + \frac{6}{5}$

E. $y = x + \frac{3}{5}$

F. $y = 2x + \frac{3}{5}$

3. $7 = 14x - 42y$

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

H. $y = \frac{1}{3}x + \frac{1}{6}$

I. $y = \frac{1}{3}x - \frac{1}{6}$

4. $8.1x - 4.5y = 5.4$

R. $y = 1.8x - 1.2$

S. $y = -1.8x + 1.2$

T. $y = 1.8x + 1.2$

5. The formula for Body Mass Index is $BMI = \frac{w}{h^2} \times 703$, where w is a person's weight (in pounds) and h is a person's height (in inches). Find the weight of a 13-year-old boy that is 60 inches tall and has a BMI of 20.5.

Q. 98 pounds

R. 105 pounds

S. 112 pounds

6. The formula $d = rt$ relates distance d to rate r and time t . Find how long it takes an airplane to fly 375 miles at 500 miles per hour.

T. 35 minutes

U. 40 minutes

V. 45 minutes

1		5	3	6	2	4
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Chapter 1

Technology Connection

For use after Section 1.3

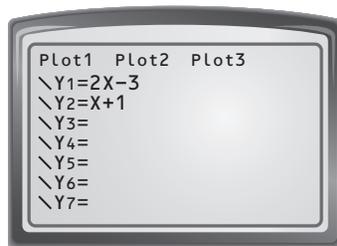
Using a Graphing Calculator to Solve Equations

You can use a graphing calculator to solve equations.

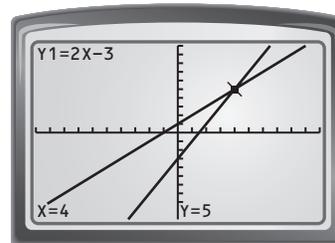
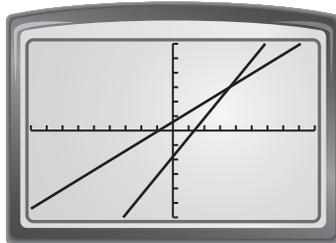
EXAMPLE Solve the equation $2x - 3 = x + 1$.

SOLUTION

Step 1 Use the **Y=** key. Enter the left side of the equation as Y_1 and the right side of the equation as Y_2 .



Step 2 Press the **GRAPH** key. Use the STANDARD WINDOW.



Step 3 Use the **TRACE** key and the left and right arrow keys to find the x -value where the two lines cross. The two lines cross when $x = 4$.

Step 4 Check your answer in the equation.

$$\begin{aligned} 2x - 3 &= x + 1 \\ 2(4) - 3 &\stackrel{?}{=} 4 + 1 \\ 8 - 3 &\stackrel{?}{=} 5 \\ 5 &= 5 \checkmark \end{aligned}$$

Use a graphing calculator to solve the following equations.

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

2. $2x + 5 = 3 + x$

3. $5x + 4 = 3x + 7$