

• Estimating Perimeter, Area, and Volume

Power Up

facts

Power Up C

mental math

Find each fraction of 60 in **a–c**.

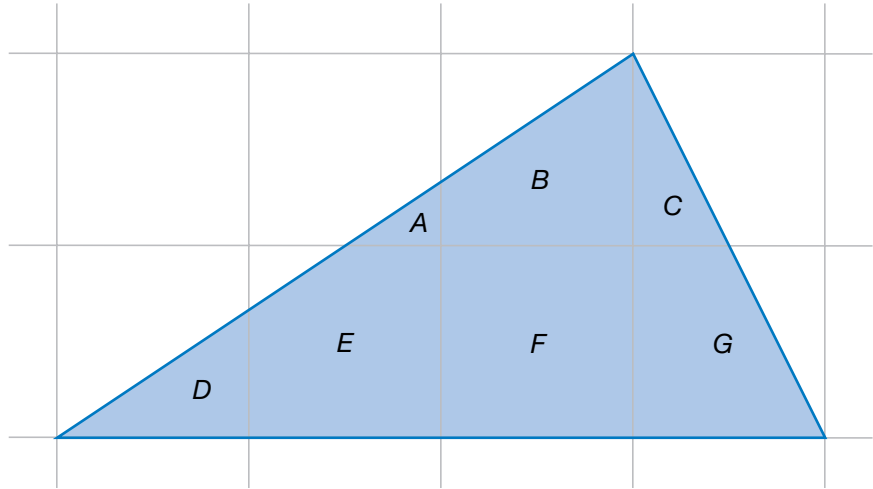
- Fractional Parts:** $\frac{1}{3}$ of 60
- Fractional Parts:** $\frac{2}{3}$ of 60
- Fractional Parts:** $\frac{3}{3}$ of 60
- Number Sense:** 50×46
- Probability:** With one roll of a dot cube, what is the probability of rolling a 4?
- Estimation:** Estimate 49×21 .
- Calculation:** $\frac{1}{3}$ of 90, $+ 50$, $+ 1$, $\sqrt{\quad}$, $\sqrt{\quad}$, $- 2$
- Roman Numerals:** Compare XLVI ○ 45

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Marco paid a dollar for an item that cost 54¢. He received four coins in change. What four coins did he receive?

New Concept

To estimate the areas of shapes, we can use a grid. On the following page, we show a triangle drawn on 1-inch grid paper. We will describe two strategies that can be used to estimate the area of the triangle.



First strategy:

Look within the outline of the figure. Count all the whole squares. Then estimate the number of whole squares that could be formed with the remaining partial squares.

Using this strategy, we count *F* as a whole square. *C* and *G* could fit together like puzzle pieces to make another square. *D* and *B* could make a third square. *A* and *E* could make a fourth square. We estimate that the area of the triangle is about 4 square inches.

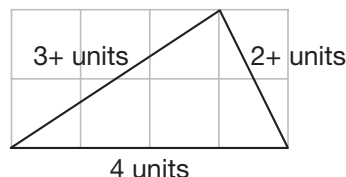
Second strategy:

Look within the outline of the figure. Count all the whole squares as in the first strategy. Then count all the squares that seem to have at least half their area within the outline of the figure. Do not count the squares that have less than half their area within the figure.

Using this strategy, we again count *F* as a whole square. Then we count *E*, *B*, and *G* because at least half the area of each square is within the outline of the triangle. We do not count *A*, *C*, or *D*. Using this strategy, we again estimate the area of the triangle to be about 4 square inches.

Both strategies help us estimate areas. An estimate is an **approximation**. Estimates may differ slightly from person to person. The goal is to make each estimate carefully.

We can also estimate the perimeter of the triangle.



We see that the base of the triangle is 4 units. The other two sides are a little more than 3 units and a little more than 2 units. So the perimeter is a little more than 9 units, or perhaps 10 units.



Activity 1

Estimating Perimeter and Area

Materials needed:

- **Lesson Activities 20** and **21**
1. Outline your hand on **Lesson Activity 21** (1-inch grid). Then estimate the area of your handprint.
 2. Outline your hand again, this time on **Lesson Activity 20** (1-cm grid). Then estimate the perimeter and area of your handprint.

One way to estimate the volume of a container is to first fill the container with unit cubes and then count the number of cubes in the container.



Activity 2

Estimating Volume

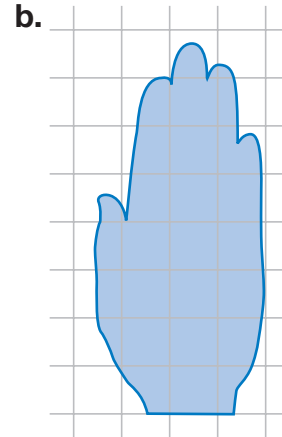
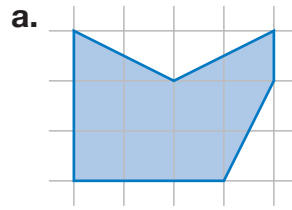
Material needed:

- **Lesson Activity 45** or unit cubes

Select a box about the size of a tissue box and fit as many unit cubes in it as you can. Estimate the volume of the box by counting the number of cubes.

Lesson Practice


Estimate the perimeter and area of each figure on these grids. Each small square represents one square centimeter in problem **a**. Each small square represents one square inch in problem **b**.



- c. Estimate** On the floor of the classroom, mark off 1 square foot, 1 square yard, and 1 square meter. Estimate the number of each kind of square it would take to cover the whole floor.

Written Practice

Distributed and Integrated

- * 1.** **a.** Three hundred seconds is how many minutes? (There are 60 seconds in each minute.)
(52, 110)
- b.** Sixty minutes is how many seconds?
- * 2.**  **Explain** Trevor, Ann, and Lee were playing marbles. Ann had twice as many marbles as Trevor had, and Lee had 5 more marbles than Ann had. Trevor had 9 marbles. How many marbles did Lee have? What is the first step?
(94)
- 3.** On each of 5 bookshelves there are 44 books. How many books are on all 5 bookshelves?
(49)
- * 4.** **a.** Nine tenths of the 30 students turned in their homework. How many students turned in their homework?
(Inv. 5, 95)
- b.** What percent of the students did not turn in their homework?

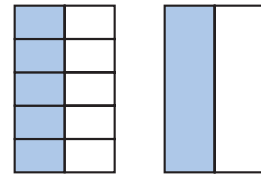
5. For parts **a–c**, refer to this number line:
(37, 102)



- The number for point *A* is what fraction?
- The number for point *B* is what decimal number?
- The number for point *C* is what fraction?

6. What fraction name for 1 has a denominator of 3?
(103)

- *7. What equivalent fractions are shown?
(109)



- *8. **Represent** Draw a picture to show that $\frac{6}{8}$ and $\frac{3}{4}$ are equivalent fractions.
(109)

9. Below is a golf scorecard for 9 holes of miniature golf. What was Michelle's average score per hole?
(96)

Putt 'N' Putt

Player	1	2	3	4	5	6	7	8	9	Total
Michelle	6	7	5	2	4	1	3	5	3	36
Mary	5	4	4	3	4	3	2	5	3	33

10. It was 11:00 a.m., and Sarah had to clean the laboratory by 4:20 p.m.
(27) How much time did she have to clean the lab?
- *11. Draw a quadrilateral that has two sides that are parallel, a third side that is perpendicular to the parallel sides, and a fourth side that is not perpendicular to the parallel sides. What type of quadrilateral did you draw?
(63)
12. The factors of 10 are 1, 2, 5, 10. The factors of 15 are 1, 3, 5, 15. Which number is the largest factor of both 10 and 15?
(55)
13. List the factors of 8. List the factors of 12. Which number is the largest factor of both 8 and 12?
(55)

14. $4.3 + 12.6 + 3.75$
(50)

15. $364.1 - 16.41$
(91)

*16. $\frac{5}{8} + \frac{2}{8}$
(107)

*17. $\frac{3}{5} + \frac{1}{5}$
(107)

*18. $1\frac{9}{10} - 1\frac{2}{10}$
(107)

19. 60×800
(86)

20. 73×48
(90)

21. $9 \times 78\text{¢}$
(48)

22. 10^3
(62, 86)

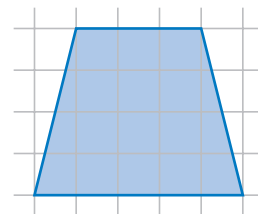
23. $4x = 3500$
(41, 76)

24. $\frac{4824}{8}$
(80)

*25. $60 \overline{)540}$
(110)

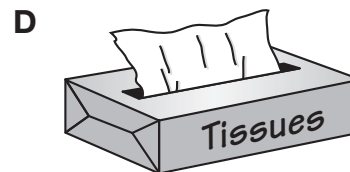
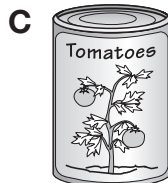
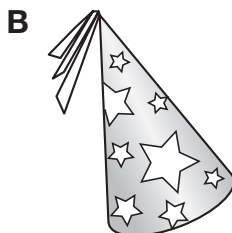
*26. $10 \overline{)463}$
(105)

- *27. Estimate the perimeter and area of this figure. Each small square represents one square inch.

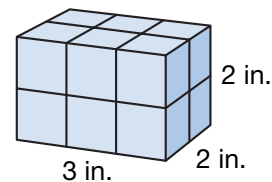


- *28. **Represent** Draw a rectangle that is 4 cm long and 1 cm wide. Then shade 25% of it.
(21, Inv. 5)

29. **Multiple Choice** Which of the following is a cylinder?
(98)



- *30. **Justify** What is the volume of this rectangular solid? Explain why your answer is reasonable.
(Inv. 11)



Early Finishers

Real-World Connection

- Choose a box in your classroom, and estimate its perimeter, area, and volume. Then find the actual perimeter, area, and volume.
- Explain how you found the perimeter, area, and volume of the box.

• Reducing Fractions

Power Up

facts

Power Up G

mental math

Find each fraction of 60 in **a–c**.

- Fractional Parts:** $\frac{1}{4}$ of 60
- Fractional Parts:** $\frac{2}{4}$ of 60
- Fractional Parts:** $\frac{3}{4}$ of 60
- Number Sense:** 30×12
- Money:** Taima had \$10.00. Then she spent \$5.63 on a journal. How much money does she have left?
- Estimation:** Eight bottles of laundry detergent cost \$40.32. Round that amount to the nearest dollar and then divide by 8 to estimate the cost per bottle.
- Calculation:** $\frac{1}{2}$ of 24, $\div 6$, square the number, $+ 8$, $\times 2$
- Roman Numerals:** Write MMCL in our number system.

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Find the next five terms in this sequence. Then describe the sequence in words.

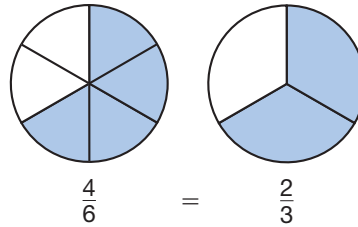
$$\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \text{---}, \text{---}, \text{---}, \text{---}, \text{---}, \dots$$

New Concept

Recall from Investigation 9 that when we *reduce* a fraction, we find an equivalent fraction written with smaller numbers. The picture below shows $\frac{4}{6}$ reduced to $\frac{2}{3}$.



Visit www.SaxonMath.com/Int4Activities for a calculator activity.



Not all fractions can be reduced. Only a fraction whose numerator and denominator can be divided by the same number can be reduced. Since both the numerator and denominator of $\frac{4}{6}$ can be divided by 2, we can reduce the fraction $\frac{4}{6}$.

To reduce a fraction, we will use a fraction that is equal to 1. To reduce $\frac{4}{6}$, we will use the fraction $\frac{2}{2}$. We divide both 4 and 6 by 2, as shown below.

$$\frac{4}{6} \div \frac{2}{2} = \frac{4 \div 2}{6 \div 2} = \frac{2}{3}$$

Example

Thinking Skill

Discuss

How do we know that both 6 and 8 are divisible by 2?

Write the reduced form of each fraction:

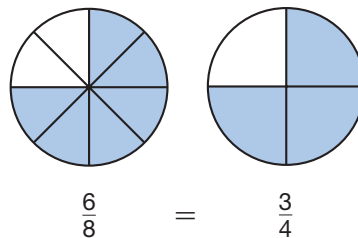
a. $\frac{6}{8}$

b. $\frac{3}{6}$

c. $\frac{6}{7}$

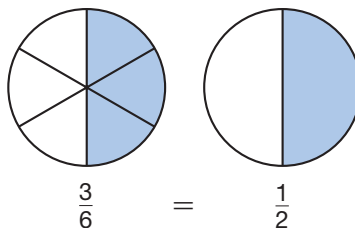
- a. The numerator and denominator are 6 and 8. These numbers can be divided by 2. That means we can reduce the fraction by dividing 6 and 8 by 2.

$$\frac{6}{8} \div \frac{2}{2} = \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$$



- b. The numerator and denominator are 3 and 6. These numbers can be divided by 3, so we reduce $\frac{3}{6}$ by dividing both 3 and 6 by 3.

$$\frac{3}{6} \div \frac{3}{3} = \frac{3 \div 3}{6 \div 3} = \frac{1}{2}$$



- c. The numerator is 6 and the denominator is 7. The only number that divides 6 and 7 is 1. Dividing the terms of a fraction by 1 does not reduce the fraction.

$$\frac{6}{7} \div \frac{1}{1} = \frac{6 \div 1}{7 \div 1} = \frac{6}{7}$$

The fraction $\frac{6}{7}$ cannot be reduced.

Justify Which number, 6 or 7, is prime? Explain why.

Lesson Practice

Write the reduced form of each fraction:

a. $\frac{2}{4}$

b. $\frac{2}{6}$

c. $\frac{3}{9}$

d. $\frac{3}{8}$

e. $\frac{2}{10}$

f. $\frac{4}{10}$

g. $\frac{9}{12}$

h. $\frac{9}{10}$

Written Practice

Distributed and Integrated

- *1. Use the following information to answer parts a and b:

(94)

One fence board costs 90¢. It takes 10 boards to build 5 feet of fence.

- How many boards are needed to build 50 feet of fence?
- How much will the boards cost altogether?

2. Find the perimeter and area of this rectangle:

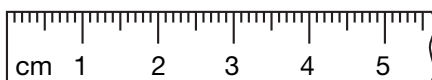
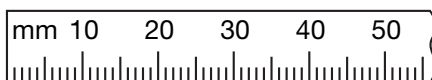
(Inv. 2,
Inv. 3)



3. a. Find the length of this line segment in millimeters.

(69)

- b. Find the length of the segment in centimeters.



***4.** Five ninths of the 36 horses were gray. How many of the horses were gray?
(95)

***5.** Change each improper fraction to a whole number or a mixed number:
(104)

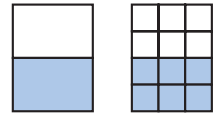
a. $\frac{15}{2}$

b. $\frac{15}{3}$

c. $\frac{15}{4}$

***6.** Angelina's mom is more than 32 years old but less than 40 years old, and her age in years is a prime number. How old is Angelina's mom?
(55)

***7. a.** What equivalent fractions are shown in the pictures at right?
(Inv. 5, 109)



b. What percent of each large rectangle is shaded?

***8.** A regular polygon has all sides the same length and all angles the same measure.
(79, 92)

a. Draw a regular quadrilateral. Show all the lines of symmetry.

b. A regular quadrilateral has how many lines of symmetry?

c. Does a regular quadrilateral have rotational symmetry?

***9.** Write the reduced form of each fraction:
(112)

a. $\frac{3}{6}$

b. $\frac{4}{6}$

c. $\frac{6}{12}$

10. In three tries, Rodney bounced the soccer ball on his foot 23 times, 36 times, and 34 times. What was the average number of bounces in each try?
(96)

11. T-shirts were priced at \$5 each. Yoshi had \$27 and bought 5 T-shirts. Tax was \$1.50. How much money did he have left?
(83)

***12.** $3\frac{3}{9} + 4\frac{4}{9}$
(107)

***13.** $\frac{1}{7} + \frac{2}{7} + \frac{3}{7}$
(107)

14. 37.2
(50) 135.7

***15.** $\frac{11}{12} - \frac{10}{12}$
(107)

***16.** $\frac{8}{10} - \frac{5}{10}$
(107)

10.62
 2.47
 $+ 14.0$

$$\begin{array}{r} 17. \quad 48 \\ (90) \quad \times 36 \\ \hline \end{array}$$

$$\begin{array}{r} 18. \quad 72 \\ (90) \quad \times 58 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \quad \$4.08 \\ (58) \quad \times \quad 7 \\ \hline \end{array}$$

$$20. \quad 25.42 + 24.8$$

(50)

$$21. \quad 36.2 - 4.27$$

(50)

$$*22. \quad 90 \div 20$$

(110)

$$23. \quad \frac{5}{8} - \frac{5}{8}$$

(107)

$$24. \quad 7 \overline{)2549}$$

(76)

$$*25. \quad \$19.40 \div 10$$

(105)

26. What number is halfway between 400,000 and 500,000?

(Inv. 1)

27. **Predict** What is the probability that a tossed coin will land heads up?

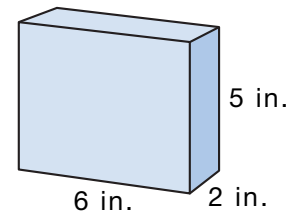
(Inv. 10)

*28. a. What is the geometric name for the shape of this box?

(98, Inv. 11)

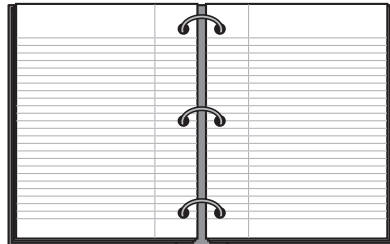
b. What is the volume of the box?

c. True or False: All of the opposite faces of the box are parallel.



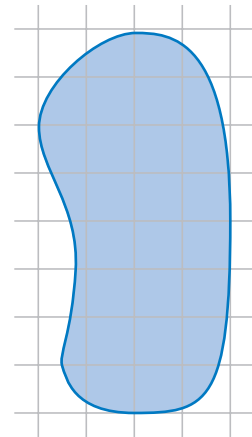
29. Mallory opened her notebook and turned a page from the right side to the left. Turning the page is like which geometric transformation?

(73)



*30. **Explain** Estimate the perimeter and area of this shoe print. Each small square represents one square inch. Describe the method you used.

(111)



• Multiplying a Three-Digit Number by a Two-Digit Number

Power Up

facts

Power Up I

mental math

An odd number can be written as an even number plus 1. For example, 9 is $8 + 1$. So half of 9 is half of 8 plus half of 1, which is $4 + \frac{1}{2}$, or $4\frac{1}{2}$. Use this strategy to find half of each odd number in **a-d**.

- Fractional Parts:** 7
- Fractional Parts:** 11
- Fractional Parts:** 21
- Fractional Parts:** 33
- Probability:** If the chance of rain is 30%, what is the chance that it will not rain?
- Estimation:** Uzuri's mother filled the car with gasoline, which cost \$33.43. Then her mother bought snacks for \$4.48. Estimate the total cost.
- Calculation:** $\frac{1}{2}$ of 100, -1 , $\sqrt{\quad}$, $+2$, $\sqrt{\quad}$, $+1$, $\sqrt{\quad}$
- Roman Numerals:** Compare MD ○ 2000

problem solving

Choose an appropriate problem-solving strategy to solve this problem. The numbers 1, 8, and 27 begin the sequence below. (Notice that $1 = 1^3$, $8 = 2^3$, and $27 = 3^3$.) Find the next three numbers in the sequence.

1, 8, 27, _____, _____, _____, ...

New Concept

We have learned to multiply a two-digit number by another two-digit number. In this lesson we will learn to multiply a three-digit number by a two-digit number.

Example 1

A bakery is open 364 days each year. On each of those days, the bakery owner bakes 24 loaves of bread. How many loaves of bread does the owner bake each year?

Thinking Skill

Justify

Why are there two partial products?

We write the three-digit number above the two-digit number so that the last digits in each number are lined up. We multiply 364 by 4. Next we multiply 364 by 2. Since this 2 is actually 20, we write the last digit of this product in the tens place, which is under the 2 in 24. Then we add and find that the owner bakes **8736 loaves of bread** each year.

$$\begin{array}{r} 1 \\ 21 \\ 364 \\ \times 24 \\ \hline 1456 \\ + 728 \\ \hline 8736 \end{array}$$

Example 2

Thinking Skill

Generalize

When one factor of a multiplication problem is dollars and cents, how many decimal places will be in the product? Name the places.

During summer vacation, a school principal ordered 38 paperback dictionaries for the school bookstore. The cost of each dictionary was \$4.07. What was the total cost of the dictionaries?

We will ignore the dollar sign and decimal point until we are finished multiplying. First we multiply 407 by 8. Then we multiply 407 by 3 (which is actually 30), remembering to shift the digits of the product one place to the left. We add and find that the product is 15466. Now we write the dollar sign and insert the decimal point two places from the right. We find that the total cost of the dictionaries was **\$154.66**.

$$\begin{array}{r} 2 \\ 5 \\ \$4.07 \\ \times 38 \\ \hline 3256 \\ + 1221 \\ \hline \$154.66 \end{array}$$

Lesson Practice

Multiply:

a. 235×24

b. 14×430

c. $\$1.25 \times 24$

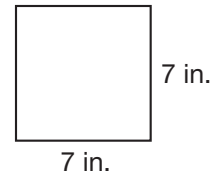
d. $\begin{array}{r} 406 \\ \times 32 \\ \hline \end{array}$

e. $\begin{array}{r} \$6.20 \\ \times 31 \\ \hline \end{array}$

f. $\begin{array}{r} 562 \\ \times 47 \\ \hline \end{array}$

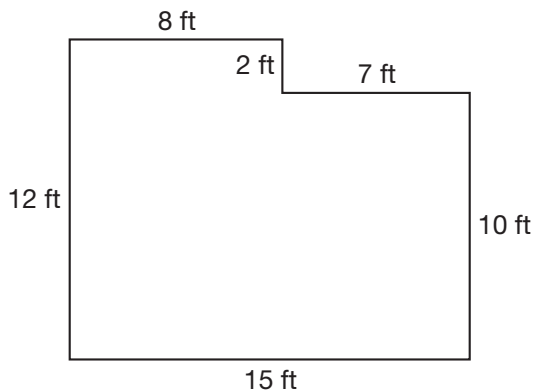
1. Carrie drove to visit her cousin who lives 3000 miles away. If Carrie (11, 52) drove 638 miles the first day, 456 miles the second day, and 589 miles the third day, how much farther does she need to drive to get to her cousin's house?

2. Find the perimeter and area of this square: (Inv. 2, Inv. 3)



3. If the perimeter of a square is 2 meters, then each side is how many (Inv. 2) centimeters long?

- *4. The figure below shows the shape and dimensions of a room. (Inv. 3, 108)



- a. How many feet of molding are needed to go around the perimeter of the room?
- b. How many 1-foot square floor tiles are needed to cover the floor?
5. **Estimate** Round 6843 to the nearest thousand. (54)
- *6. Write the reduced form of each fraction: (112)
- a. $\frac{4}{5}$ b. $\frac{5}{10}$ c. $\frac{4}{10}$
7. **Represent** Write 374.251 using words. (84)

*8. **Represent** Draw a picture to show that $\frac{1}{2}$ and $\frac{4}{8}$ are equivalent fractions.

*9. **Connect** Write three fractions equivalent to $\frac{1}{4}$.

10. The concession stand at an elementary school basketball tournament earned a profit of \$750 during a 3-day tournament. What is the average profit earned during each day of the tournament?

*11. **Estimate** The explorer Zebulon Pike estimated that the mountain's height was eight thousand, seven hundred forty-two feet. His estimate was five thousand, three hundred sixty-eight feet less than the actual height. Today we call this mountain Pikes Peak. What is the height of Pikes Peak?

12. $6 \overline{)4837}$

13. $\frac{1372}{\sqrt{16}}$

*14. $40 \overline{)960}$

*15. $20 \overline{)1360}$

16. $30.07 - 3.7$

17. $46.0 - 12.46$

18. 37.15

*19. $\begin{array}{r} \$3.20 \\ \times 46 \\ \hline \end{array}$

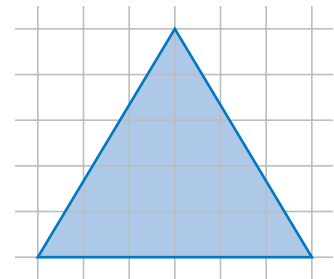
*20. $\begin{array}{r} 307 \\ \times 25 \\ \hline \end{array}$

6.84
 1.29
 29.1
 $\hline + 3.6$

*21. $\frac{8}{15} + \frac{6}{15}$

*22. $4\frac{4}{5} - 1\frac{3}{5}$

*23. Estimate the perimeter and area of this triangle. Each small square represents one square centimeter.



24. **Conclude** Write the next three numbers in this counting sequence:

..., 10,000, 20,000, 30,000, ...

- *25. a. **Multiple Choice** Which of these triangles appears to be an equilateral triangle?
(63, 78)



- b. Describe the angles in triangle **B**.
c. Describe the segments in triangle **B**.

26. **Multiple Choice** To remove the lid from the pickle jar, J’Rhonda turned the lid counterclockwise two full turns. J’Rhonda turned the lid about how many degrees?
(75)

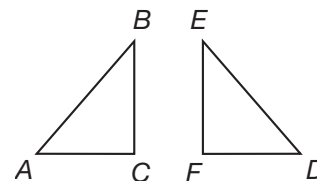
A 360° **B** 180° **C** 720° **D** 90°

- *27. a. Which of the letters below has no lines of symmetry?
(79)

M I C K E Y

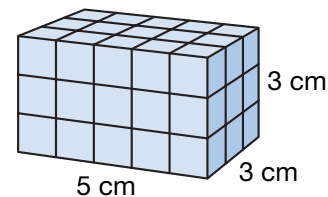
- b. Which letter has rotational symmetry?

- *28. Triangles ABC and DEF are congruent. Which transformations would move $\triangle ABC$ to the position of $\triangle DEF$?
(73)



- *29. If each side of an equilateral triangle is $2\frac{1}{4}$ inches long, what is the perimeter of the triangle?
(Inv. 2, 107)

- *30. What is the volume of this stack of cubes?
(Inv. 11)



• Simplifying Fraction Answers

Power Up

facts

Power Up H

mental math

- Percent:** 25% of 24
- Percent:** 50% of 24
- Percent:** 75% of 24
- Number Sense:** 20×250
- Measurement:** The half-gallon container is half full. How many quarts of liquid are in the container?
- Estimation:** Each square folding table is 122 cm on each side. Estimate the total length of 4 folding tables if they are lined up in a row.
- Calculation:** $6^2 - 6, + 20, \div 2, - 1, \div 2$
- Roman Numerals:** Write MDX in our number system.

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Nala solved a division problem and then erased some of the digits from the problem. She gave it to Eduardo as a problem-solving exercise. Find the missing digits for Eduardo.

$$\begin{array}{r} 8 _ \\ _) _ _ 7 \\ \underline{24} \\ _ _ \\ \underline{_ _} \\ 0 \end{array}$$

New Concept

We often write answers to math problems in the simplest form possible. If an answer contains a fraction, there are two procedures that we usually follow.

1. We write improper fractions as mixed numbers (or whole numbers).
2. We reduce fractions when possible.

Example 1

Thinking Skill

Justify

Explain why
 $\frac{4}{3} = 1\frac{1}{3}$.

Add: $\frac{2}{3} + \frac{2}{3}$

We add the fractions and get the sum $\frac{4}{3}$. Notice that $\frac{4}{3}$ is an improper fraction. We take the extra step of changing $\frac{4}{3}$ to the mixed number $1\frac{1}{3}$.

$$\frac{2}{3} + \frac{2}{3} = \frac{4}{3}$$

$$\frac{4}{3} = 1\frac{1}{3}$$

Example 2

Subtract: $\frac{3}{4} - \frac{1}{4}$

We subtract and get the difference $\frac{2}{4}$. Notice that $\frac{2}{4}$ can be reduced. We take the extra step of reducing $\frac{2}{4}$ to $\frac{1}{2}$.

$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$$

$$\frac{2}{4} = \frac{1}{2}$$

Example 3

Nicholas exercises each day by walking. The route he walks each morning is $3\frac{1}{3}$ miles long, and the route he walks each evening is $4\frac{2}{3}$ miles long. Altogether, how many miles does Nicholas walk each day?

We add the mixed numbers and get the sum $7\frac{3}{3}$. Notice that $\frac{3}{3}$ is an improper fraction equal to 1. So $7\frac{3}{3} = 7 + 1$, which is 8. Nicholas walked **8 miles** altogether.

$$3\frac{1}{3} + 4\frac{2}{3} = 7\frac{3}{3}$$

$$7\frac{3}{3} = 8$$

Example 4

Add: $5\frac{3}{5} + 6\frac{4}{5}$

We add the mixed numbers and get $11\frac{7}{5}$. Notice that $\frac{7}{5}$ is an improper fraction that can be changed to $1\frac{2}{5}$. So $11\frac{7}{5}$ equals $11 + 1\frac{2}{5}$, which is $12\frac{2}{5}$.

$$5\frac{3}{5} + 6\frac{4}{5} = 11\frac{7}{5}$$

$$11\frac{7}{5} = 12\frac{2}{5}$$

Example 5

A piece of fabric $1\frac{3}{8}$ yards in length was cut from a bolt of fabric that measured $6\frac{5}{8}$ yards long. How long is the piece of fabric left on the bolt?

Thinking Skills

Represent

Draw a picture to show that $\frac{2}{8} = \frac{1}{4}$.

We subtract and get $5\frac{2}{8}$. Notice that $\frac{2}{8}$ can be reduced, so we reduce $\frac{2}{8}$ to $\frac{1}{4}$ and get $5\frac{1}{4}$. The length of the fabric is **$5\frac{1}{4}$ yards.**

$$6\frac{5}{8} - 1\frac{3}{8} = 5\frac{2}{8}$$
$$5\frac{2}{8} = 5\frac{1}{4}$$

Lesson Practice

Simplify the answer to each sum or difference:

a. $\frac{4}{5} + \frac{4}{5}$

b. $\frac{5}{6} - \frac{1}{6}$

c. $3\frac{2}{3} + 1\frac{2}{3}$


d. $5\frac{1}{4} + 6\frac{3}{4}$

e. $7\frac{7}{8} - 1\frac{1}{8}$

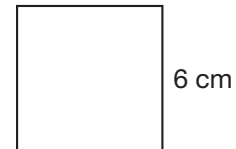
f. $5\frac{3}{5} + 1\frac{3}{5}$

Written Practice

Distributed and Integrated

- *1.  **Justify** Tessa made 70 photocopies. If she paid 6¢ per copy and the total tax was 25¢, how much change should she have gotten back from a \$5 bill? Is your answer reasonable? Why or why not?

2. a. What is the area of this square?
(Inv. 2, Inv. 3)
b. What is the perimeter of the square?




- *3. Use the information below to answer parts **a** and **b**.
(94, 96)
Walker has \$9. Dembe has twice as much money as Walker.
Chris has \$6 more than Dembe.

- a. How much money does Chris have?
b. What is the average amount of money each boy has?

4. Use this table to answer the questions that follow:
(32)

Number of Bagels	12	24	36	48	60
Number of Dozens	1	2	3	4	5

- a.  **Generalize** Write a rule that describes the relationship of the data.
b. **Predict** How many bagels is 12 dozen bagels?

5. **Analyze** (94) There are 40 quarters in a roll of quarters. What is the value of 2 rolls of quarters?

6. **Estimate** (76) Lucio estimated that the exact quotient of 1754 divided by 9 was close to 20. Did Lucio make a reasonable estimate? Explain why or why not.

*7. Write the reduced form of each fraction: (112)

a. $\frac{2}{12}$

b. $\frac{6}{8}$

c. $\frac{3}{9}$

*8. **Analyze** (107, 109) Find a fraction equal to $\frac{1}{3}$ by multiplying $\frac{1}{3}$ by $\frac{2}{2}$. Write that fraction, and then add it to $\frac{3}{6}$. What is the sum?

*9. **Conclude** (72) The three runners wore black, red, and green T-shirts. The runner wearing green finished one place ahead of the runner wearing black, and the runner wearing red was not last. Who finished first? Draw a diagram to solve this problem.

*10. (Inv. 10) If an event cannot happen, its probability is 0. If an event is certain to happen, its probability is 1. What is the probability of rolling a 7 with one roll of a standard number cube?

11. (Inv. 5, 70) Dresses were on sale for 50% off. If the regular price of the dress was \$40, then what was the sale price?

12. (50) $4.62 + 16.7 + 9.8$

13. (45, 91) $14.62 - (6.3 - 2.37)$

*14. (114) $\frac{3}{5} + \frac{4}{5}$

*15. (107) $16 + 3\frac{3}{4}$

*16. (114) $1\frac{2}{3} + 3\frac{1}{3}$

*17. (114) $\frac{2}{5} + \frac{3}{5}$

*18. (114) $7\frac{4}{5} + 7\frac{1}{5}$

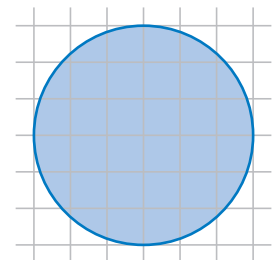
*19. (114) $6\frac{2}{3} + 3\frac{2}{3}$

*20. (113) 372×39

*21. (113) 47×142

*22. (Inv. 3, 58) $360 \times \sqrt{36}$

*23. (111) Estimate the area of this circle. Each small square represents one square centimeter.

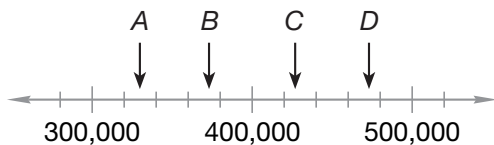


24. $8y = 4832$
(41, 80)

25. $\frac{2840}{2^3}$
(62, 76)

*26. $30 \overline{)963}$
(110)

- *27. **Represent** Which arrow could be pointing to 427,063?
(Inv. 1)



- *28. If the length of each side of a square is $1\frac{1}{4}$ inches, then what is the perimeter of the square?
(Inv. 2, 114)

29. What is the geometric shape of a volleyball?
(98)

- *30. Use the Distributive Property to multiply:
(108)

$$5(20 + 6)$$

Early Finishers

Real-World Connection

Lun Lun is a giant panda at the Atlanta Zoo. Lun Lun eats about 210 pounds of bamboo a week.

- If he eats $\frac{1}{7}$ of the bamboo on Monday and $\frac{2}{7}$ on Tuesday, what fractional part of his weekly serving did Lun Lun eat?
- If Lun Lun eats $\frac{3}{7}$ of his bamboo Wednesday through Saturday, how much bamboo will he have left on Sunday? Write your answer as a fraction.

• Renaming Fractions

Power Up

facts

Power Up H

mental math

- Percent:** 25% of 36
- Percent:** 75% of 36
- Percent:** 100% of 36
- Percent:** Three of the 30 students are left-handed. What percent of the students are left-handed?
- Measurement:** A'Narra hit the softball 116 feet. Then the ball rolled 29 feet. How many feet did the softball travel?
- Estimation:** Estimate 16×49 . First round 49 to the nearest ten; then use the “double and half” method.
- Calculation:** 3×20 , $+ 40$, $\sqrt{\quad}$, $- 7$, square the number
- Roman Numerals:** Compare: 65 ○ LXV

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Find the next three terms of this sequence. Then describe the sequence in words.

..., \$1000.00, \$100.00, \$10.00, _____, _____, _____, ...

New Concept

Remember that when we multiply a fraction by a fraction name for 1, the result is an equivalent fraction. For example, if we multiply $\frac{1}{2}$ by $\frac{2}{2}$, we get $\frac{2}{4}$. The fractions $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent fractions because they have the same value.

$$\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$$

Sometimes we must choose a particular multiplier that is equal to 1.

Example 1

Thinking Skill

Discuss

How can we check the answer?

Find the equivalent fraction for $\frac{1}{4}$ whose denominator is 12.

To change 4 to 12, we must multiply by 3. So we multiply $\frac{1}{4}$ by $\frac{3}{3}$.

$$\frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$$

The fraction $\frac{1}{4}$ is equivalent to $\frac{3}{12}$.

Example 2

Thinking Skill

Verify

How can we check the answer?

Complete the equivalent fraction: $\frac{2}{3} = \frac{?}{15}$

The denominator changed from 3 to 15. Since the denominator was multiplied by 5, the correct multiplier is $\frac{5}{5}$.

$$\frac{2}{3} \times \frac{5}{5} = \frac{10}{15}$$

Thus, the missing numerator of the equivalent fraction is **10**.

Lesson Practice

Complete each equivalent fraction:

a. $\frac{1}{4} = \frac{?}{12}$

b. $\frac{2}{3} = \frac{?}{12}$

c. $\frac{5}{6} = \frac{?}{12}$

d. $\frac{3}{5} = \frac{?}{10}$

e. $\frac{2}{3} = \frac{?}{9}$

f. $\frac{3}{4} = \frac{?}{8}$

Written Practice

Distributed and Integrated

1. If a can of soup costs \$1.50 and serves 3 people, how much would it cost to serve soup to 12 people?

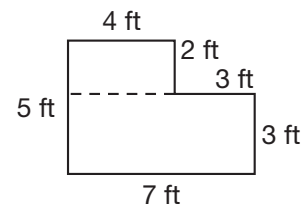
(94)

- *2. The polygon at right is divided into two rectangles.

(Inv. 3, 108)

a. What is the perimeter of the figure?

b. What is the area of the figure?

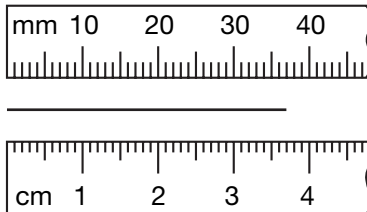


3. What number is eight less than the product of nine and ten? Write an expression.

(94)

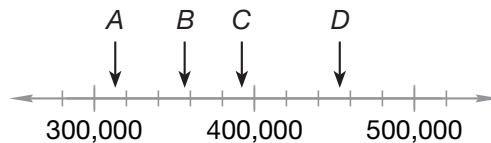
4. Sanjay needs to learn 306 new words for the regional spelling bee. ⁽⁹⁵⁾ He has already memorized $\frac{2}{3}$ of the new words. How many words does Sanjay still need to memorize? Draw a picture to illustrate the problem.

- *5. a. Find the length of this line segment in centimeters. ⁽⁶⁹⁾
 b. Find the length of the segment in millimeters.



6. **Represent** Use words to write 356,420. ⁽³³⁾

- *7. **Represent** Which arrow could be pointing to 356,420? ^(Inv. 1)



- *8. Complete each equivalent fraction: ⁽¹¹⁵⁾

a. $\frac{1}{2} = \frac{?}{6}$

b. $\frac{1}{3} = \frac{?}{6}$

c. $\frac{2}{3} = \frac{?}{6}$

- *9. Write the reduced form of each fraction: ⁽¹¹²⁾

a. $\frac{2}{6}$

b. $\frac{6}{9}$

c. $\frac{9}{16}$

- *10. a. There were 40 workers on the job. Of those workers, 10 had worked overtime. What fraction of the workers had worked overtime? ^(Inv. 5, 112)
 (Remember to reduce the fraction.)

- b. What percent of the workers had worked overtime?

11. How many different three-digit numbers can you write using the digits ⁽³⁾ 6, 3, and 2? Each digit may be used only once in every number you write.

12. **Conclude** Jamar received \$10 for his tenth birthday. Each year after that, he received \$1 more than he did on his previous birthday. He saved all his birthday money. In all, how much birthday money did Jamar have on his fifteenth birthday? ^(3, 94)

- * 13. **Analyze** Every morning Marta walks $2\frac{1}{2}$ miles. How many miles does Marta walk in two mornings?
(114)

14. $9.36 - (4.37 - 3.8)$
(45, 50)

15. $24.32 - (8.61 + 12.5)$
(45, 50)

* 16. $5\frac{5}{8} + 3\frac{3}{8}$
(114)

* 17. $6\frac{3}{10} + 1\frac{2}{10}$
(114)

* 18. $8\frac{2}{3} - 5\frac{1}{3}$
(107)

* 19. $4\frac{3}{4} - 2\frac{1}{4}$
(114)

* 20. 125×16
(113)

* 21. $12 \times \$1.50$
(113)

22. $6m = 3642$
(80)

23. $\$125 \div 5$
(65, 76)

* 24. $40 \overline{)645}$
(110)

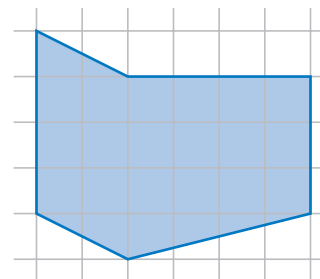
25. $3m = 6^2$
(61, 62)

26. **Evaluate** If n is 16, then what does $3n$ equal?
(106)

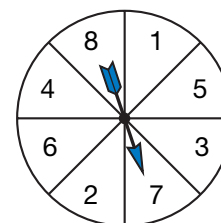
27. In three classrooms there were 18, 21, and 21 students. What was the average number of students per classroom?
(96)

28. Dion's temperature is 99.8°F . Normal body temperature is about 98.6°F . Dion's temperature is how many degrees above normal body temperature?
(31, 43)

- * 29. Estimate the perimeter and area of this piece of land. Each small square represents one square mile.
(111)



- * 30. **Predict** If the arrow is spun, what is the probability that it will stop on a number greater than 5?
(Inv. 10)



• Common Denominators

Power Up

facts

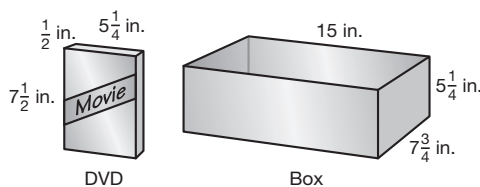
mental math

problem solving

Power Up H

- Percent:** 10% of 60
- Percent:** 20% of 60
- Percent:** 30% of 60
- Fractional Parts:** $\frac{1}{2}$ of 27
- Probability:** Use one of the words *certain*, *likely*, *unlikely*, or *impossible* to describe the likelihood of this situation: Joel will roll a number greater than 0 with a standard dot cube.
- Estimation:** Estimate 14×41 . First round 41 to the nearest ten; then use the “double and half” method.
- Calculation:** $11 \times 3, + 3, \div 9, - 4 \times 1$
- Roman Numerals:** Write CM in our number system.

Choose an appropriate problem-solving strategy to solve this problem. Kamaria keeps DVDs in a box that is 15 inches long, $7\frac{3}{4}$ inches wide, and $5\frac{1}{4}$ inches tall. The DVDs are $7\frac{1}{2}$ inches long, $5\frac{1}{4}$ inches wide, and $\frac{1}{2}$ inch thick. What is the greatest number of DVDs she can fit into the box?



New Concept

Two or more fractions have **common denominators** if their denominators are equal.

$$\frac{3}{8} \quad \frac{5}{8}$$

These two fractions have common denominators.

$$\frac{3}{8} \quad \frac{5}{9}$$

These two fractions do *not* have common denominators.

In this lesson we will use common denominators to rename fractions whose denominators are not equal.

Example 1

Math Language

One way to find a *common denominator* is to multiply the denominators.

$$3 \times 4 = 12$$

When we multiply two numbers, each number is a factor of the product.

Rename $\frac{2}{3}$ and $\frac{3}{4}$ so that they have a common denominator of 12.

To rename a fraction, we multiply it by a fraction name for 1. To change the denominator of $\frac{2}{3}$ to 12, we multiply $\frac{2}{3}$ by $\frac{4}{4}$. To change the denominator of $\frac{3}{4}$ to 12, we multiply $\frac{3}{4}$ by $\frac{3}{3}$.

$$\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$$

$$\frac{2}{3} = \frac{8}{12}$$

$$\frac{3}{4} \times \frac{3}{3} = \frac{9}{12}$$

$$\frac{3}{4} = \frac{9}{12}$$

Example 2

Rename $\frac{1}{2}$ and $\frac{1}{3}$ so that they have a common denominator.

This time we need to find a common denominator before we can rename the fractions. The denominators are 2 and 3. The product of 2 and 3 is 6, so 6 is a common denominator.

To get denominators of 6, we multiply $\frac{1}{2}$ by $\frac{3}{3}$, and we multiply $\frac{1}{3}$ by $\frac{2}{2}$.

$$\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$$

$$\frac{1}{2} = \frac{3}{6}$$

$$\frac{1}{3} \times \frac{2}{2} = \frac{2}{6}$$

$$\frac{1}{3} = \frac{2}{6}$$

In Examples 1 and 2, we found a common denominator of two fractions by multiplying the denominators. This method works for any two fractions. However, this method often produces a denominator larger than necessary. For example, a common denominator for $\frac{1}{2}$ and $\frac{3}{8}$ is 16, but a lower common denominator is 8. We usually look for the **least common denominator** when we want to rename fractions with common denominators.

Example 3

Write $\frac{1}{3}$ and $\frac{1}{6}$ with common denominators.

A common denominator is the product of 3 and 6, which is 18. However, the least common denominator is 6 because $\frac{1}{3}$ can be renamed as sixths.

$$\frac{1}{3} \cdot \frac{2}{2} = \frac{2}{6}$$

The fractions are $\frac{2}{6}$ and $\frac{1}{6}$.

Lesson Practice

- Rename $\frac{1}{2}$ and $\frac{1}{5}$ so that they have a common denominator of 10.
- Rename $\frac{1}{2}$ and $\frac{5}{6}$ so that they have a common denominator of 12.

Rename each pair of fractions using their least common denominator:

c. $\frac{1}{2}$ and $\frac{2}{3}$

d. $\frac{1}{3}$ and $\frac{1}{4}$

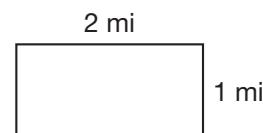
e. $\frac{1}{2}$ and $\frac{3}{5}$

f. $\frac{2}{3}$ and $\frac{2}{5}$

Written Practice

Distributed and Integrated

- ⁽⁹⁵⁾ Evan found 24 seashells. If he gave one fourth of them to his brother, how many did he keep?
- ^(Inv. 2) Rectangular Park is 2 miles long and 1 mile wide. Gordon ran around the park twice. How many miles did he run?
- ⁽⁹⁴⁾ *3. If 2 oranges cost 42¢, how much would 8 oranges cost?



4. a. **Represent** Three fourths of the 64 baseball cards showed rookie players. How many of the baseball cards showed rookie players? Draw a picture to illustrate the problem.

(Inv. 5,
95)

b. What percent of the baseball cards showed rookie players?

5. Write these numbers in order from greatest to least:

(Inv. 9)

$$7.2 \quad 7\frac{7}{10} \quad 7\frac{3}{10} \quad 7.5$$

*6. **Multiple Choice** Which of these fractions is *not* equivalent to $\frac{1}{2}$?

(103,
109)

A $\frac{3}{6}$

B $\frac{5}{10}$

C $\frac{10}{21}$

D $\frac{50}{100}$

*7. Complete each equivalent fraction:

(115)

a. $\frac{1}{2} = \frac{?}{12}$

b. $\frac{1}{3} = \frac{?}{12}$

c. $\frac{1}{4} = \frac{?}{12}$

*8. Write the reduced form of each fraction:

(112)

a. $\frac{5}{10}$

b. $\frac{8}{15}$

c. $\frac{6}{12}$

9. **Analyze** Darlene paid 42¢ for 6 clips and 64¢ for 8 erasers. What was the cost of each clip and each eraser? What would be the total cost of 10 clips and 20 erasers?

(94)

10. **Conclude** There were 14 volunteers the first year, 16 volunteers the second year, and 18 volunteers the third year. If the number of volunteers continued to increase by 2 each year, how many volunteers would there be in the tenth year? Explain how you know.

(3, 72)

*11. a. Rename $\frac{1}{4}$ and $\frac{2}{3}$ by multiplying the denominators.

(116)

b. Rename $\frac{1}{3}$ and $\frac{3}{4}$ using their least common denominator.

12. **Predict** A standard dot cube is rolled. What is the probability that the number of dots rolled will be less than seven?

(Inv. 10)

13. $47.14 - (3.63 + 36.3)$

(45, 50)

14. $50.1 + (6.4 - 1.46)$

(45, 50)

*15. $\frac{3}{4} + \frac{3}{4} + \frac{3}{4}$

(114)

*16. $4\frac{1}{6} + 1\frac{1}{6}$

(114)

*17. $5\frac{3}{5} + 1\frac{2}{5}$

(114)

$$*18. \frac{5}{6} + \frac{1}{6}$$

$$*19. 12\frac{3}{4} - 3\frac{1}{4}$$

$$*20. 6\frac{1}{5} - 1\frac{1}{5}$$

$$*21. 340 \times 15$$

$$*22. 26 \times 307$$

$$*23. 70 \times 250$$

$$*24. \frac{3550}{5}$$

$$*25. 432 \div 30$$

$$*26. 9 \overline{)5784}$$

- *27. ^(19, 101) Karen is planning a trip to Los Angeles from Chicago for her vacation. She finds the following two round-trip flight schedules. Use the information below to answer parts **a–c**.

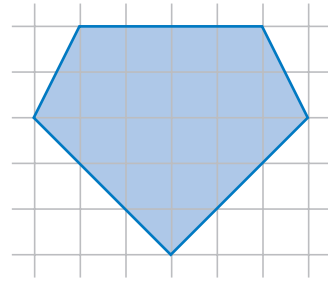
Passengers: 1		Price: \$246.00		
Flight number	Departure city	Date Time	Arrival city	Date Time
12A	ORD Chicago	7/21 06:11 p.m.	LAX Los Angeles	7/21 08:21 p.m.
46	LAX Los Angeles	7/28 06:39 p.m.	ORD Chicago	7/29 12:29 a.m.

Passengers: 1		Price: \$412.00		
Flight number	Departure city	Date Time	Arrival city	Date Time
24	ORD Chicago	7/21 08:17 a.m.	LAX Los Angeles	7/21 10:28 a.m.
142	LAX Los Angeles	7/28 03:28 p.m.	ORD Chicago	7/28 09:18 p.m.

- a.** If Karen wants to arrive in Los Angeles in the morning, how much will she pay for airfare?
- b.** If Karen chooses the more economical round-trip, when is her return flight scheduled to land?
- c. Multiple Choice** There is a 2-hour time difference between Chicago and Los Angeles. About how long does a flight between those cities last?
- A** 2 hours **B** 4 hours **C** 6 hours **D** 8 hours

For problems **28** and **29**, refer to the pentagon at right.

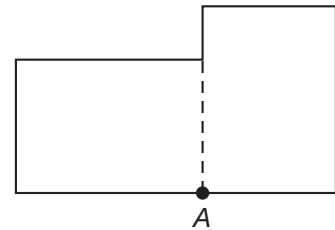
- *28.** Estimate the area of the pentagon. Each small square represents one square inch.
(111)



- *29.** a. Does the pentagon have reflective symmetry?
(79)
b. Does the pentagon have rotational symmetry?

- *30.** Refer to the figure to answer parts **a** and **b**.
(73, 108)

- a. The hexagon is formed by two joined rectangles. Which transformation would move one rectangle to the position of the other rectangle?
- b. If each rectangle is 5 inches by 7 inches, then what is the area of the hexagon?



Early Finishers

Real-World Connection

A science fair was being held at Emmy's school. She wanted to design an experiment that tested giving bean plants liquids other than water. Emmy decided to test giving vinegar to a plant. Emmy had $\frac{9}{15}$ oz of vinegar. She gave the plant $\frac{2}{5}$ oz of vinegar. How much vinegar does Emmy have left after her experiment? Simplify your answer.

• Rounding Whole Numbers Through Hundred Millions

Power Up

facts

Power Up J

mental math

- Percent:** 10% of 70
- Percent:** 20% of 70
- Percent:** 30% of 70
- Percent:** 40% of 70
- Percent:** 60% of 70
- Estimation:** Choose the more reasonable estimate for the length of a playground seesaw: 2.7 meters or 2.7 feet.
- Calculation:** 100×5 , $- 400$, $\div 4$, $\sqrt{\quad}$
- Roman Numerals:** Compare CXC ○ 120

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Write the next four fractions in this sequence. Then describe the sequence in words.

$$\frac{1}{4}, \frac{2}{8}, \frac{3}{12}, \text{---}, \text{---}, \text{---}, \text{---}, \dots$$

New Concept

We have rounded whole numbers to the nearest hundred and to the nearest thousand. In this lesson we will practice rounding numbers to the nearest ten thousand, the nearest hundred thousand, and so on through the nearest hundred million.

Recall the locations of the whole-number place values through hundred trillions:



Visit www.SaxonMath.com/Int4Activities for an online activity.

Whole-Number Place Values

hundred trillions	hundred billions	hundred millions	hundred thousands	hundreds
ten trillions	ten billions	ten millions	ten thousands	tens
trillions	billions	millions	thousands	ones
_____	_____	_____	_____	_____
				decimal point

After rounding to the nearest ten thousand, each place to the right of the ten-thousands place will be zero.

Analyze How is the value of each place related to the value of the place to its right?

Example 1

Round 38,274 to the nearest ten thousand.

Counting by ten thousands, we say “ten thousand, twenty thousand, thirty thousand, forty thousand,” and so on. We know that 38,274 is between 30,000 and 40,000. Halfway between is 35,000. Since 38,274 is greater than 35,000, we round up to **40,000**.

After rounding to the nearest hundred thousand, each place to the right of the hundred-thousands place will be zero.

Example 2

Round 47,681 to the nearest thousand.

Counting by thousands, 47,681 is between 47,000 and 48,000. Halfway between is 47,500. Since 47,681 is greater than 47,500, we round up to **48,000**.

Example 3

Round 427,063 to the nearest hundred thousand.

Counting by hundred thousands, we say “one hundred thousand, two hundred thousand, three hundred thousand, four hundred thousand,” and so on. We know that 427,063 is between 400,000 and 500,000. Halfway between is 450,000. Since 427,063 is less than halfway between 400,000 and 500,000, we round down to **400,000**.

Example 4

Round 12,876,250 to the nearest million.

The number begins with “twelve million.” Counting by millions from 12 million, we say “twelve million, thirteen million,” and so on. We know that 12,876,250 is between 12 million and 13 million. Since 12,876,250 is more than halfway to 13 million, we round up to **13,000,000**.

Lesson Practice

Estimate Round each number to the nearest ten thousand:

a. 19,362

b. 31,289

Estimate Round each number to the nearest hundred thousand:

c. 868,367

d. 517,867


e. Round 2,156,324 to the nearest million.

f. Round 28,376,000 to the nearest ten million.

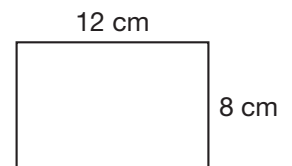
g. Round 412,500,000 to the nearest hundred million.

Written Practice

Distributed and Integrated

1.  **Explain** Forty-five students are separated into four groups. ⁽⁸⁸⁾ The number of students in each group is as equal as possible. How many students are in the largest group? Explain your reasoning.

2. a. What is the area of this rectangle?
^(Inv. 2, Inv. 3) b. What is the perimeter of this rectangle?



- * 3. **Represent** Iggy answered $\frac{5}{6}$ of the 90 questions correctly. ⁽⁹⁵⁾ How many questions did Iggy answer correctly? Draw a picture to illustrate the problem.

4. Name the shape of each object:

⁽⁹⁸⁾

a. roll of paper towels

b. baseball

*5. Write the reduced form of each fraction:

(112)

a. $\frac{3}{6}$

b. $\frac{5}{15}$

c. $\frac{8}{12}$

*6. Rename $\frac{3}{4}$ and $\frac{5}{6}$ using their least common denominator.

(116)

7. Which digit is in the ten-millions place in 328,496,175?

(33)

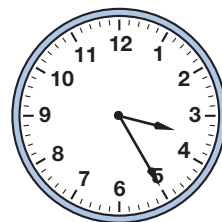
8. **Analyze** Draw a picture to help you solve this problem:

(25)

The town of Winder is between Atlanta and Athens. It is 73 miles from Athens to Atlanta. It is 23 miles from Winder to Athens. How many miles is it from Winder to Atlanta?

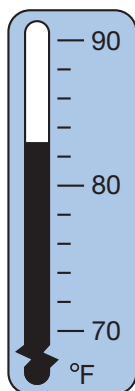
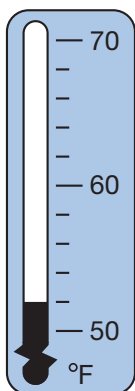
9. Caleb volunteers after school as a tutor. Each afternoon he begins a tutoring session at the time shown on the clock and finishes three quarters of an hour later. What time does each tutoring session end?

(27)



10. These thermometers show the average daily minimum and maximum temperatures in Helena, Montana, during the month of July. What are those temperatures?

(18)



11. $4.36 + 12.7 + 10.72$

(50)

12. $8.54 - (4.2 - 2.17)$

(45, 91)

*13. $\frac{5}{9} + \frac{5}{9}$

(114)

*14. $3\frac{2}{3} + 1\frac{2}{3}$

(114)

15. $4\frac{5}{8} + 1$

(107)

*16. $7\frac{2}{3} + 1\frac{2}{3}$

(114)

*17. $4\frac{4}{9} + 1\frac{1}{9}$

(107)

*18. $\frac{11}{12} + \frac{1}{12}$

(114)

*19. 570×64

(113)

*20. 382×31

(113)

21. 54×18

(90)

$$22. \frac{3731}{7}$$

$$23. 9 \overline{)5432}$$

$$*24. 60 \overline{)548}$$

25. **Predict** The first five square numbers are 1, 4, 9, 16, and 25.

(Inv. 3)

What is the eighth term of this sequence? Write an equation to support your answer.

- *26. **Estimate** In the year 2000, the population of Texas was 20,851,820.

(117)

Round that number to the nearest million.

- *27. a. **Multiple Choice** Hasana built a square frame using pieces of wood, but when he leaned against it, the frame shifted to this shape at right. What word does *not* name this shape?

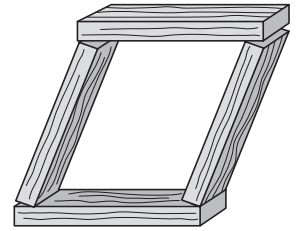
(92)

A quadrilateral

B parallelogram

C rhombus

D trapezoid



b. Describe the angles.

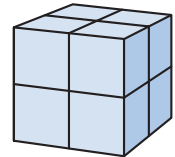
c. Describe the sides.

28. If the perimeter of a square is 6 centimeters, then each side is how many millimeters long?

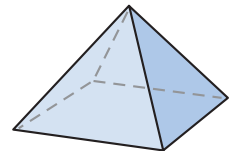
(Inv. 2,
69)

- *29. a. This cube is made up of how many smaller cubes?

(98)



- b. A cube has how many more vertices than this pyramid?

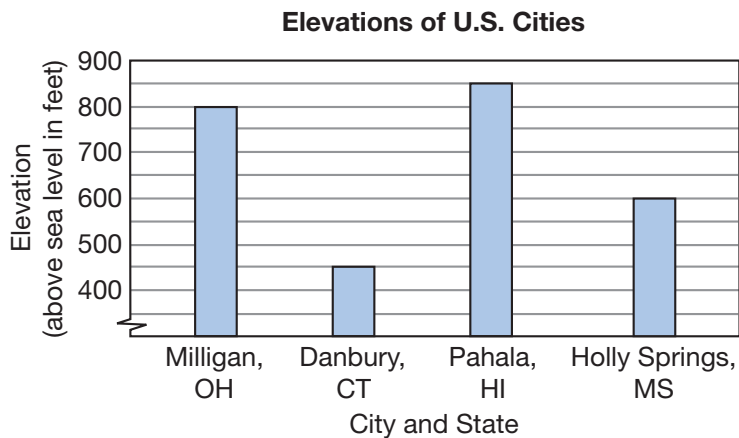


* 30.
(Inv. 6)



Interpret

The graph shows the approximate elevations of four cities in the United States.



Use the graph to answer parts **a** and **b**.

- Which cities have an elevation difference of 250 feet?
- Which city is nearest sea level? Explain your answer.

Early Finishers

Real-World Connection

Earth is the third planet from the sun in our solar system. The average distance from Earth to the sun is 92,750,000 miles. Mars is the fourth planet from the sun in our solar system. The average distance from Mars to the sun is 141,650,000 miles.

- Round each distance to the nearest hundred thousand miles.
- Round each distance to the nearest million miles.

• Dividing by Two-Digit Numbers

Power Up

facts

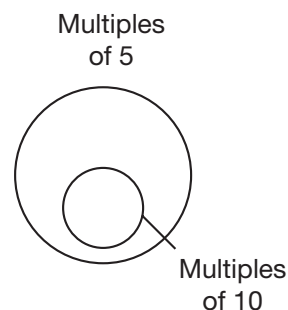
mental math

problem solving

Power Up I

- Percent:** 50% of 34
- Percent:** 50% of 25
- Percent:** 100% of 25
- Number Sense:** 5×66
- Money:** Toby gave the clerk a \$10 bill to purchase batting gloves that cost \$9.13. How much change should he receive?
- Estimation:** Stan purchased 2 books priced at \$8.95 each and another book that cost \$13.88. Estimate the total cost of the books.
- Calculation:** $5 \times 6, - 6, - 4, \div 5, \div 4$
- Roman Numerals:** Write XCI in our number system.

Choose an appropriate problem-solving strategy to solve this problem. In this Venn diagram, the outer circle stands for multiples of 5. The inner circle stands for multiples of 10. The inner circle is completely contained by the outer circle because every multiple of 10 is also a multiple of 5. Copy this Venn diagram on your paper, and place the numbers 15, 20, 45, 70, and 63.



New Concept

We have divided by two-digit numbers that are multiples of 10. In this lesson we will begin dividing by other two-digit numbers. Sometimes, when dividing by two-digit numbers, we might accidentally choose an “answer” that is too large. If this happens, we start over and try a smaller number.

Example 1

Thinking Skill

Verify

What are the 4 steps in division?

Divide: $31 \overline{)95}$

Step 1: To help us divide $31 \overline{)95}$, we may think “ $3 \overline{)9}$.” We write “3” above the 5 in 95.

$$\begin{array}{r} 3 \text{ R} \\ 31 \overline{)95} \\ \underline{93} \\ 2 \end{array}$$

Step 2: We multiply 3 by 31 and write “93.”

Step 3: We subtract 93 from 95 and write “2.”

Step 4: There are no digits to bring down. The answer is **3 R 2**.

Example 2

Divide: $43 \overline{)246}$

Step 1: To help us divide $43 \overline{)246}$, we may think “ $4 \overline{)24}$.” We write “6” above the 6 in 246.

$$\begin{array}{r} 6 \\ 43 \overline{)246} \\ \underline{258} \leftarrow \text{too large} \end{array}$$

Step 2: We multiply 6 by 43 and write “258.” We see that 258 is greater than 246, so 6 is too large for our answer.

Start Over:

Step 1: This time we try 5 as our answer.

Step 2: We multiply 5 by 43 and write “215.”

Step 3: We subtract 215 from 246 and write “31.”

Step 4: There are no digits to bring down. The answer is **5 R 31**.

$$\begin{array}{r} 5 \text{ R } 31 \\ 43 \overline{)246} \\ \underline{215} \\ 31 \end{array}$$

Justify How can we check the answer?

Example 3

Four hundred eighty-seven students will be assigned to classrooms so that the average number of students in each room is 21. How many classrooms of students will there be?

Thinking Skill

Discuss

Why do we write the digit 2 in the tens place of the quotient?

We divide 487 by 21. We follow the four steps: divide, multiply, subtract, and bring down.

Step 1: We break the problem into a smaller division problem. We think “21)48” and write “2” above the 8 in 487.

$$\begin{array}{r} 2 \\ 21 \overline{)487} \\ \underline{42} \\ 67 \end{array}$$

Step 2: We multiply 2 by 21 and write “42.”

Step 3: We subtract 42 from 48 and write “6.”

Step 4: We bring down the 7, making 67.

Repeat:

Step 1: We divide 67 by 21 and write “3” above the division box.

$$\begin{array}{r} 23 \text{ R } 4 \\ 21 \overline{)487} \\ \underline{42} \\ 67 \\ \underline{63} \\ 4 \end{array}$$

Step 2: We multiply 3 by 21 and write “63.”

The quotient 23 R 4 means that 487 students will fill **23 classrooms** with 21 students and there will be 4 extra students. Four students are not enough for another classroom, so some classrooms will have more than 21 students.

Step 3: We subtract 63 from 67 and write “4.”

Step 4: There are no digits to bring down. The answer is 23 R 4.

Lesson Practice

Divide:

a. $32 \overline{)128}$

b. $21 \overline{)90}$

c. $25 \overline{)68}$

d. $42 \overline{)250}$

e. $41 \overline{)880}$

f. $11 \overline{)555}$

Written Practice

Distributed and Integrated

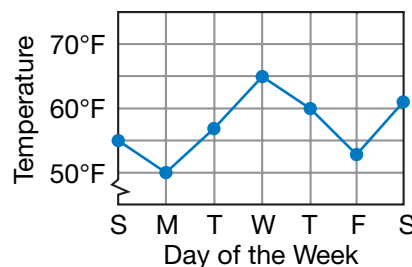
*1. **Interpret** Use the information in the graph to answer parts a–c.
(Inv. 6)

a. On which day was the temperature the highest?

b. What was the high temperature on Tuesday?

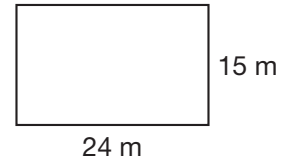
c. From Monday to Wednesday, the high temperature went up how many degrees?

High Temperatures for the Week



2. a. What is the perimeter of this rectangle?
(Inv. 2,
Inv. 3)

b. What is the area of the rectangle?

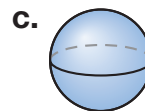
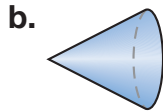


3. **Analyze** The first five square numbers are 1, 4, 9, 16, and 25, and their average is 11. What is the average of the next five square numbers?
(96)

4. What percent of the months of the year begin with the letter J?
(Inv. 5,
54)

5. There are 52 cards in a deck. Four of the cards are aces. What is the probability of drawing an ace from a full deck of cards?
(Inv. 10,
112)

6. **Classify** Name each shape:
(98)



*7. Write the reduced form of each fraction:
(112)

a. $\frac{6}{8}$

b. $\frac{4}{9}$

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

*8. Rename $\frac{2}{3}$ and $\frac{3}{4}$ using their least common denominators.
(116)

*9. **Represent** Use words to write the number 27386415.
(34)

10. **Represent** Point W stands for what number on this number line?
(94)



*11. **Represent** Draw two parallel segments that are one inch long and one inch apart. Then make a quadrilateral by drawing two more parallel segments. What type of quadrilateral did you draw?
(23, 92)

*12. $4\frac{4}{5} + 3\frac{3}{5}$
(114)

*13. $5\frac{1}{6} + 1\frac{2}{6}$
(114)

*14. $7\frac{3}{4} + \frac{1}{4}$
(114)

*15. $13\overline{)50}$
(118)

*16. $72\overline{)297}$
(118)

*17. $5\frac{3}{8} + 5\frac{1}{8}$
(114)

18. $4\frac{1}{6} + 2\frac{1}{6}$
(114)

19. 720×36
(113)

20. 147×54
(113)

21. $8 \overline{)5766}$
(80)

*22. $21 \overline{)441}$
(118)

23. $4.75 + 16.14 + 10.9$
(50)

24. $18.4 - (4.32 - 2.6)$
(45, 91)

- *25. **Estimate** In the year 2000, the population of the state of New York was 18,976,457. Round that number to the nearest million.
(117)

- *26. **Estimate** Round 297,576,320 to the nearest hundred million.
(117)

- *27. In Jahzara's first nine games she earned these scores:
(97)

90, 95, 80, 85, 100, 95, 75, 95, 90

Use this information to answer parts **a** and **b**.

a. What is the median and range of Jahzara's scores?

b. What is the mode of Jahzara's scores?

28. Write these numbers in order from least to greatest:
(Inv. 9)

$5\frac{11}{100}$ 5.67 5.02 $5\frac{83}{100}$

29. Yasmine wanted to divide 57 buttons into 13 groups. How many groups will Yasmine have? Will there be any buttons left over?
(118)

30. Rename $\frac{2}{3}$ and $\frac{3}{5}$ so that they have a common denominator of 15.
(116)

• Adding and Subtracting Fractions with Different Denominators

Power Up

facts

Power Up J

mental math

- Percent:** 50% of 90
- Percent:** 10% of 90
- Percent:** 90% of 90
- Number Sense:** 5×84
- Probability:** Use one of the words *certain*, *likely*, *unlikely*, or *impossible* to describe the likelihood that Hannah can flip a coin 100 times and get heads every time.
- Estimation:** Estimate 48×34 . Increase 48 by 2 and decrease 34 by 2; then use the “double and half” method.
- Calculation:** 50% of 10, $+ 7$, $- 8$, $\div 2$, $\div 2$
- Roman Numerals:** Compare: XCIV \bigcirc 110

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Kathy has a two-digit combination lock for her bicycle. She can choose any combination to set from 00 to 99. Kathy wants to set a combination in which the second digit is greater than the first digit, such as 05 or 47 but not 42. How many possibilities can Kathy choose from? Explain how you found your answer.

New Concept

In order to add or subtract fractions that have different denominators, we must first rename the fractions so that they have common denominators. Recall that we rename a fraction by multiplying it by a fraction name for 1.

Example 1

A recipe calls for $\frac{1}{4}$ of a cup of whole milk and $\frac{3}{8}$ of a cup of skim milk. What amount of milk does the recipe call for altogether?

Thinking Skill

Discuss

Why can we use 8 as the common denominator?

The denominators are different. Notice that a common denominator is 8. We rename $\frac{1}{4}$ by multiplying it by $\frac{2}{2}$. The result is $\frac{2}{8}$. Now we can add.

$$\begin{array}{r} \text{Rename.} \\ \frac{1}{4} \times \frac{2}{2} = \frac{2}{8} \\ + \frac{3}{8} \\ \hline \frac{5}{8} \end{array} \quad \begin{array}{l} \text{Add.} \\ \frac{3}{8} \end{array}$$

Altogether, the recipe calls for $\frac{5}{8}$ cup of milk.

Example 2

Chuck looked at the clock and saw that the lunch bell would ring in $\frac{5}{6}$ of an hour. Chuck looked at the clock again $\frac{1}{2}$ hour later. At that time, what fraction of an hour remained until the lunch bell rang?

At first, $\frac{5}{6}$ of an hour remained. Then $\frac{1}{2}$ hour went by. If we subtract $\frac{1}{2}$ from $\frac{5}{6}$, we can find what fraction of an hour remains. The denominators are different, but we can rename $\frac{1}{2}$ as a fraction whose denominator is 6. Then we subtract and reduce the answer.

$$\begin{array}{r} \text{Rename.} \\ \frac{5}{6} = \frac{5}{6} \\ - \frac{1}{2} \times \frac{3}{3} = \frac{3}{6} \\ \hline \frac{2}{6} = \frac{1}{3} \\ \text{Reduce.} \end{array} \quad \begin{array}{l} \text{Subtract.} \\ \frac{3}{6} \end{array}$$

We find that $\frac{1}{3}$ hour remained until lunch.

Lesson Practice

Find each sum or difference. Reduce when possible.

a. $\frac{1}{2} + \frac{2}{6}$

b. $\frac{1}{3} + \frac{1}{9}$

c. $\frac{1}{8} + \frac{1}{2}$

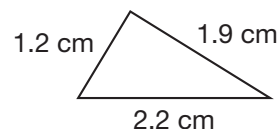
d. $\frac{3}{8} - \frac{1}{4}$

e. $\frac{2}{3} - \frac{2}{9}$

f. $\frac{7}{8} - \frac{1}{2}$

1. Zuna used 1-foot-square floor tiles to cover the floor of a room
(Inv. 3, 90) 15 feet long and 12 feet wide. How many floor tiles did she use?

2. a. What is the perimeter of this triangle?
(Inv. 2, 78)



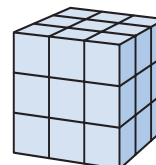
b. Is this triangle equilateral, isosceles, or scalene?

*3. **Represent** Elsa found that $\frac{3}{8}$ of the 32 pencils in the room had no erasers. How many pencils had no erasers? Draw a picture to illustrate the problem.
(95)

4. a. Seventy-two pencils is how many dozen pencils?
(41, Inv. 5)
b. How many pencils is 50% of one dozen pencils?

*5. **Estimate** Using rounding or compatible numbers, which numbers would you choose to estimate the exact product of 75×75 ? Explain your reasoning.
(42, 49)

6. This cube is constructed of smaller cubes that are each one cubic centimeter in volume. What is the volume of the larger cube?
(Inv. 11)



7. Fausta bought 2 DVDs priced at \$21.95 each and 2 CDs priced at \$14.99 each. The tax was \$4.62. What was the total cost of the items? Explain how you found your answer.
(83)

8. T'Ron drove 285 miles in 5 hours. What was his average speed in miles per hour?
(96)

9. **Multiple Choice** Which of these fractions is *not* equivalent to $\frac{1}{2}$?
(103, 109)
A $\frac{4}{8}$ B $\frac{11}{22}$ C $\frac{15}{30}$ D $\frac{12}{25}$

*10. Write the reduced form of each fraction:
(112)
a. $\frac{8}{10}$ b. $\frac{6}{15}$ c. $\frac{8}{16}$

- * **11. Represent** Use words to write the number 123415720.
(33)

12. $8.3 + 4.72 + 0.6 + 12.1$
(50)

13. $17.42 - (6.7 - 1.23)$
(45, 91)

* **14.** $3\frac{3}{8} + 3\frac{3}{8}$
(114)

* **15.** $\frac{1}{4} + \frac{1}{8}$
(119)

* **16.** $\frac{1}{2} + \frac{1}{6}$
(119)

* **17.** $5\frac{5}{6} - 1\frac{1}{6}$
(114)

* **18.** $\frac{1}{4} - \frac{1}{8}$
(119)

* **19.** $\frac{1}{2} - \frac{1}{6}$
(119)

* **20.** 87×16
(90)

* **21.** 49×340
(86, 113)

* **22.** 504×30
(86, 113)

23. $\$35.40 \div 6$
(71, 80)

24. $\frac{5784}{4}$
(76)

25. $7 \overline{)2385}$
(80)

26. $30 \overline{)450}$
(110)

* **27.** $32 \overline{)450}$
(118)

* **28.** $15 \overline{)450}$
(118)

- * **29. Predict** What is the probability of drawing a heart from a full deck of cards? (*Hint:* There are 13 hearts in a deck.)
(Inv. 10, 112)

- * **30. Represent** Draw a rectangle that is 5 cm long and 2 cm wide, and divide the rectangle into square centimeters. Then shade 30% of the rectangle.
(21, Inv. 5)

Early Finishers

Real-World Connection

Vic wants to make a CD for his party. He bought a blank CD that holds 4 hours of music. One half of the space on Vic's CD is rock music, $\frac{1}{4}$ is hip-hop music, and $\frac{1}{8}$ is jazz. He wants to add a few country songs to the CD in the remaining space. The method Vic used to calculate the amount of space he has left to add country songs is shown below:

$$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} = \frac{2}{4} + \frac{1}{4} + \frac{1}{8} = \frac{3}{4} + \frac{1}{8} = \frac{6}{8} + \frac{1}{8} = \frac{7}{8} \text{ of music recorded.}$$

$$4 \text{ hours} - \frac{7}{8} = \frac{32}{8} - \frac{7}{8} = \frac{25}{8} = 3\frac{1}{8} \text{ hours left.}$$

Is Vic's calculation correct? If not, where did he go wrong and what is the correct answer?

• Adding and Subtracting Mixed Numbers with Different Denominators

Power Up

facts

Power Up J

mental math

- Percent:** 75% of 60
- Percent:** 70% of 60
- Percent:** 90% of 60
- Number Sense:** 20×23
- Measurement:** A cubit is about 18 inches. About how many feet is two cubits?
- Estimation:** If Ricardo has \$12, does he have enough money to buy 4 maps that cost \$2.87 each?
- Calculation:** $\frac{1}{2}$ of 44, -12 , -6 , $\times 6$
- Roman Numerals:** Write MCM in our number system.

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Find the next eight numbers in this sequence. Then describe the sequence in words.

$$\frac{1}{8}, \frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad},$$

$$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \dots$$

New Concept

To add or subtract mixed numbers, we first make sure the fractions have common denominators.

Example 1

Thinking Skill

Connect

What are the steps for adding and subtracting fractions and mixed numbers that have different denominators?

Add: $4\frac{1}{6} + 2\frac{1}{2}$

The denominators of the fractions are not the same. We can rename $\frac{1}{2}$ so that it has a denominator of 6 by multiplying $\frac{1}{2}$ by $\frac{3}{3}$. Then we add, remembering to reduce the fraction part of our answer.

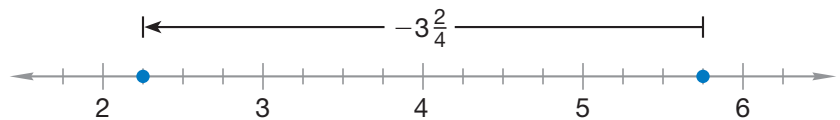
$$\begin{array}{r} 4\frac{1}{6} = 4\frac{1}{6} \\ + 2\frac{1}{2} = 2\frac{3}{6} \\ \hline 6\frac{4}{6} = 6\frac{2}{3} \end{array}$$

Example 2

A bicycle trail in a state park is $5\frac{3}{4}$ miles long. The trail is flat for $3\frac{1}{2}$ miles. How many miles of the trail are not flat? Draw a number line and use numbers to show the subtraction.

We first rewrite the problem so that the fractions have common denominators. We can rename $\frac{1}{2}$ so that it has a denominator of 4 by multiplying $\frac{1}{2}$ by $\frac{2}{2}$. Then we subtract.

$$\begin{array}{r} 5\frac{3}{4} = 5\frac{3}{4} \\ - 3\frac{1}{2} \times \frac{2}{2} = 3\frac{2}{4} \\ \hline 2\frac{1}{4} \end{array}$$



We find that $2\frac{1}{4}$ miles are not flat.

Lesson Practice

Add. Reduce when possible.

a. $3\frac{1}{2} + 1\frac{1}{4}$

b. $4\frac{3}{4} + 1\frac{1}{8}$

c. $4\frac{1}{5} + 1\frac{3}{10}$

d. $6\frac{1}{6} + 1\frac{1}{3}$

Subtract. Reduce when possible.

e. $3\frac{7}{8} - 1\frac{1}{4}$

f. $2\frac{3}{5} - 2\frac{1}{10}$

g. $6\frac{7}{12} - 1\frac{1}{6}$

h. $4\frac{3}{4} - 1\frac{1}{2}$

1. The Lorenzos drank 11 gallons of milk each month. How many quarts of milk did they drink each month?
(40)

2. Sixty people are in the marching band. If one fourth of them play trumpet, how many do not play trumpet? Draw a picture to illustrate the problem.
(95)

3. a. What is the area of this square?
(Inv. 2, Inv. 3)

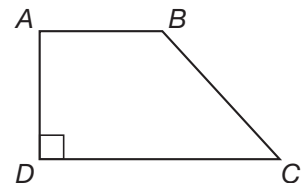


b. What is the perimeter of the square?

* 4. a. **Analyze** Esteban is 8 inches taller than Trevin. Trevin is 5 inches taller than Chelsea. Estaban is 61 inches tall. How many inches tall is Chelsea?
(94, 96)

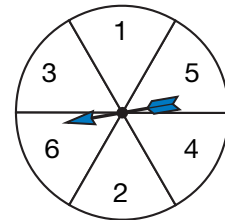
b. What is the average height of the three children?

5. Which line segments in figure $ABCD$ appear to be parallel?
(23)



6. **Explain** Mayville is between Altoona and Watson. It is 47 miles from Mayville to Altoona. It is 24 miles from Mayville to Watson. How far is it from Altoona to Watson? Explain why your answer is reasonable.
(25)

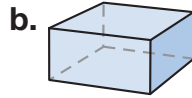
* 7. **Predict** If the arrow is spun, what is the probability that it will stop on a number greater than 4?
(Inv. 10)



* 8. **Estimate** The asking price for the new house was \$298,900. Round that amount of money to the nearest hundred thousand dollars.
(117)

- *9. **Classify** Name each of the shapes below. Then list the number of vertices, edges, and faces that each shape has.

(98)



- *10. Write the reduced form of each fraction:

(112)

a. $\frac{9}{15}$

b. $\frac{10}{12}$

c. $\frac{12}{16}$

11. **Represent** Use digits to write one hundred nineteen million, two hundred forty-seven thousand, nine hundred eighty-four.

(34)

12. $14.94 - (8.6 - 4.7)$

(45, 50)

13. $6.8 - (1.37 + 2.2)$

(45, 91)

*14. $3\frac{2}{5} + 1\frac{4}{5}$

(114)

*15. $\frac{5}{8} + \frac{1}{4}$

(119)

*16. $1\frac{1}{3} + 1\frac{1}{6}$

(120)

*17. $5\frac{9}{10} - 1\frac{1}{5}$

(120)

*18. $\frac{5}{8} - \frac{1}{4}$

(119)

*19. $\frac{1}{3} - \frac{1}{6}$

(119)

*20. 38×217

(113)

*21. 173×60

(113)

*22. 90×500

(86)

23. $7 \overline{)2942}$

(80)

24. $10 \overline{)453}$

(105)

*25. $11 \overline{)453}$

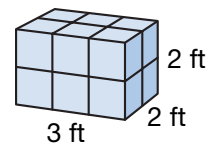
(118)

- *26. Evaluate $m + n$ when m is $3\frac{2}{5}$ and n is $2\frac{1}{10}$.

(106, 120)

27. What is the volume of this rectangular solid?

(Inv. 11)



- *28. **Connect** Segment AC is $3\frac{1}{2}$ inches long. Segment AB is $1\frac{1}{2}$ inches long. How long is segment BC ?

(114)



- *29. **Estimate** Fewer people live in Wyoming than in any other state. According to the 2000 U.S. census, 493,782 people lived in Wyoming. Round this number of people to the nearest hundred thousand.

(117)

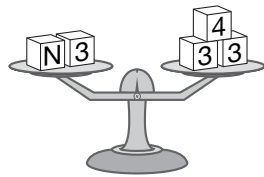
30. One half of a dollar plus $\frac{1}{4}$ of a dollar totals what percent of a dollar?

(36, Inv. 5)

Focus on

• Solving Balanced Equations

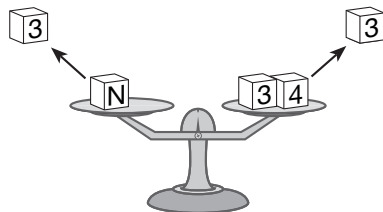
An *equation* states that two quantities are equal. One model for an equation is a balanced scale. The scale below is balanced because the combined weight on one side of the scale equals the combined weight on the other side. The weight of each block is given by its number. We do not know the weight of the block labeled N . Below the scale we have written an equation for the illustration.



$$N + 3 = 10$$

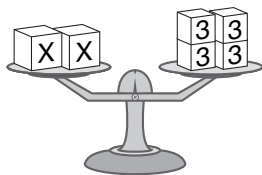
We can find the weight N by removing a weight of 3 from each side of the scale. Then N is alone on one side of the scale, and the weight on the other side of the scale must equal N .

Remove 3 from each side of the scale:



$$N = 7$$

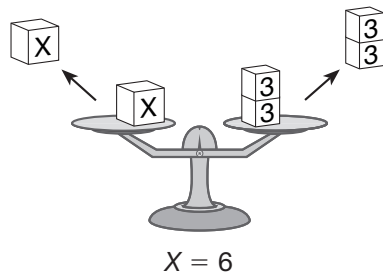
Another balanced scale is shown below. We see that two blocks of weight X balances four blocks of weight 3.



$$2X = 12$$

We can find the weight X by removing half of the weight from each side of the scale. Now one block of weight X balances two blocks of weight 3.

Remove half the weight from each side of the scale:



Activity

Solving Equations

Material needed:

- **Lesson Activity 49**

As a class, work problems **1–8** on **Lesson Activity 49**. Write an equation for each illustration, and discuss how to get the lettered block alone on one side of the scale while keeping the scale balanced.



- Create an equation for the class to solve using the model of a balanced scale and an unknown weight.
- Copy the table below for the equation $y = \frac{x+1}{2}$ and find the missing values for y .

x	1	5	7	11	
y	1	3			

- Choose a different odd number for x to complete the table, and then find y .

• Roman Numerals Through 39

New Concept

Roman numerals were used by the ancient Romans to write numbers. Today Roman numerals are still used to number such things as book chapters, movie sequels, and Super Bowl games. We might also find Roman numerals on clocks and buildings.

Some examples of Roman numerals are as follows:

I which stands for 1

V which stands for 5

X which stands for 10

The Roman numeral system does not use place value. Instead, the values of the numerals are added or subtracted, depending on their position. For example:

II means 1 plus 1, which is 2 (II does not mean “11”)

Below we list the Roman numerals for the numbers 1 through 20. Study the patterns.

1 = I	11 = XI
2 = II	12 = XII
3 = III	13 = XIII
4 = IV	14 = XIV
5 = V	15 = XV
6 = VI	16 = XVI
7 = VII	17 = XVII
8 = VIII	18 = XVIII
9 = IX	19 = XIX
10 = X	20 = XX

The multiples of 5 are 5, 10, 15, 20, and so on. The numbers that are one less than these (4, 9, 14, 19, ...) have Roman numerals that involve subtraction.

$$4 = \text{IV} \quad (\text{"one less than five"})$$

$$9 = \text{IX} \quad (\text{"one less than ten"})$$

$$14 = \text{XIV} \quad (\text{ten plus "one less than five"})$$

$$19 = \text{XIX} \quad (\text{ten plus "one less than ten"})$$

In each case where a smaller Roman numeral (I) precedes a larger Roman numeral (V or X), we subtract the smaller number from the larger number.

Example

a. Write **XXVII** in our number system.¹

b. Write **34** in Roman numerals.

a. We can break up the Roman numeral and see that it equals 2 tens plus 1 five plus 2 ones.

$$\begin{array}{r} \text{XX} \quad \text{V} \quad \text{II} \\ 20 + 5 + 2 = \mathbf{27} \end{array}$$

b. We think of 34 as "30 plus 4."

$$\begin{array}{r} 30 + 4 \\ \text{XXX} \quad \text{IV} \end{array}$$

The Roman numeral for 34 is **XXXIV**.

Lesson Practice

Write the Roman numerals for 1 to 39 in order.

¹ The modern world has adopted the Hindu-Arabic number system with the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and base-ten place value. For simplicity, we refer to the Hindu-Arabic system as "our number system."

• Roman Numerals Through Thousands

New Concept

We have practiced using these Roman numerals:

I V X

With these numerals we can write counting numbers up to XXXIX (39). To write larger numbers, we must use the Roman numerals L (50), C (100), D (500), and M (1000). The table below shows the different Roman numeral “digits” we have learned, as well as their respective values.

Numeral	Value
I	1
V	5
X	10
L	50
C	100
D	500
M	1000

Example

Write each Roman numeral in our number system:

a. LXX b. DCCL c. XLIV d. MMI

a. LXX is $50 + 10 + 10$, which is **70**.

b. DCCL is $500 + 100 + 100 + 50$, which is **750**.

c. XLIV is “10 less than 50” plus “1 less than 5”; that is,
 $40 + 4 = \mathbf{44}$.

d. MMI is $1000 + 1000 + 1$, which is **2001**.

Lesson Practice

Write each Roman numeral in our number system:

a. CCCLXII

b. CCLXXXV

c. CD

d. XLVII

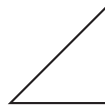
e. MMMCCLVI

f. MCMXCIX

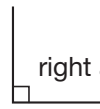
A

acute angle
(23)

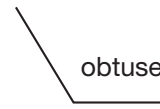
An angle whose measure is more than 0° and less than 90° .



acute angle



right angle



obtuse angle

not acute angles

*An **acute angle** is smaller than both a right angle and an obtuse angle.*

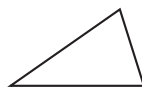
ángulo agudo

Ángulo que mide más de 0° y menos de 90° .

*Un **ángulo agudo** es menor que un ángulo recto y que un ángulo obtuso.*

acute triangle
(78)

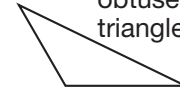
A triangle whose largest angle measures less than 90° .



acute triangle



right triangle



obtuse triangle

not acute triangles

triángulo acutángulo

Triángulo cuyo ángulo mayor es menor que 90° .

addend
(1)

Any one of the numbers in an addition problem.

$2 + 3 = 5$ *The **addends** in this problem are 2 and 3.*

sumando

Cualquiera de los números en un problema de suma.

$2 + 3 = 5$ *Los **sumandos** en este problema son el 2 y el 3.*

addition
(1)

An operation that combines two or more numbers to find a total number.

$7 + 6 = 13$ *We use **addition** to combine 7 and 6.*

suma

Una operación que combina dos o mas números para encontrar un número total.

$7 + 6 = 13$ *Usamos la **suma** para combinar el 7 y el 6.*

a.m.
(19)

The period of time from midnight to just before noon.

*I get up at 7 **a.m.**, which is 7 o'clock in the morning.*

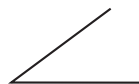
a.m.

Período de tiempo desde la medianoche hasta justo antes del mediodía.

*Me levanto a las 7 **a.m.**, lo cual es las 7 en punto de la mañana.*

angle
(23)

The opening that is formed when two lines, line segments, or rays intersect.



*These line segments form an **angle**.*

ángulo

Abertura que se forma cuando se intersecan dos rectas, segmentos de recta o rayos.

*Estos segmentos de recta forman un **ángulo**.*

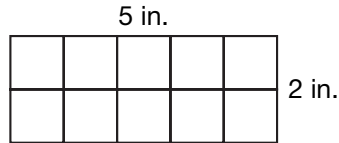
apex (98) The vertex (pointed end) of a cone.

ápice El vértice (punta) de un cono.

approximation (111) See **estimate**.

aproximación Ver **estimar**.

area (Inv. 3) The number of square units needed to cover a surface.



The **area** of this rectangle is 10 square inches.

área El número de unidades cuadradas que se necesita para cubrir una superficie.
El **área** de este rectángulo es de 10 pulgadas cuadradas.

array (Inv. 3) A rectangular arrangement of numbers or symbols in columns and rows.

$$\begin{array}{ccc} X & X & X \\ X & X & X \\ X & X & X \\ X & X & X \end{array}$$
 This is a 3-by-4 **array** of Xs.
It has 3 columns and 4 rows.

matriz Un arreglo rectangular de números o símbolos en columnas y filas.
Esta es una **matriz** de Xs de 3 por 4. Tiene 3 columnas y 4 filas.

Associative Property of Addition (45)

The grouping of addends does not affect their sum. In symbolic form, $a + (b + c) = (a + b) + c$. Unlike addition, subtraction is not associative.

$$(8 + 4) + 2 = 8 + (4 + 2)$$

$$(8 - 4) - 2 \neq 8 - (4 - 2)$$

*Addition is **associative**.*

*Subtraction is not **associative**.*

propiedad asociativa de la suma

La agrupación de los sumandos no altera la suma. En forma simbólica, $a + (b + c) = (a + b) + c$. A diferencia de la suma, la resta no es asociativa.

$$(8 + 4) + 2 = 8 + (4 + 2)$$

$$(8 - 4) - 2 \neq 8 - (4 - 2)$$

La suma es **asociativa**.

La resta no es **asociativa**.

Associative Property of Multiplication (45)

The grouping of factors does not affect their product. In symbolic form, $a \times (b \times c) = (a \times b) \times c$. Unlike multiplication, division is not associative.

$$(8 \times 4) \times 2 = 8 \times (4 \times 2)$$

$$(8 \div 4) \div 2 \neq 8 \div (4 \div 2)$$

*Multiplication is **associative**.*

*Division is not **associative**.*

propiedad asociativa de la multiplicación

La agrupación de los factores no altera el producto. En forma simbólica, $a \times (b \times c) = (a \times b) \times c$. A diferencia de la multiplicación, la división no es asociativa.

$$(8 \times 4) \times 2 = 8 \times (4 \times 2)$$

$$(8 \div 4) \div 2 \neq 8 \div (4 \div 2)$$

La multiplicación es **asociativa**.

La división no es **asociativa**.

average

(96)

The number found when the sum of two or more numbers is divided by the number of addends in the sum; also called *mean*.

To find the **average** of the numbers 5, 6, and 10, first add.

$$5 + 6 + 10 = 21$$

Then, since there were three addends, divide the sum by 3.

$$21 \div 3 = 7$$

The **average** of 5, 6, and 10 is 7.

promedio

Número que se obtiene al dividir la suma de dos o más números por la cantidad de sumandos; también se le llama *media*.

Para calcular el **promedio** de los números 5, 6 y 10, primero se suman.

$$5 + 6 + 10 = 21$$

Como hay tres sumandos, se divide la suma entre 3.

$$21 \div 3 = 7$$

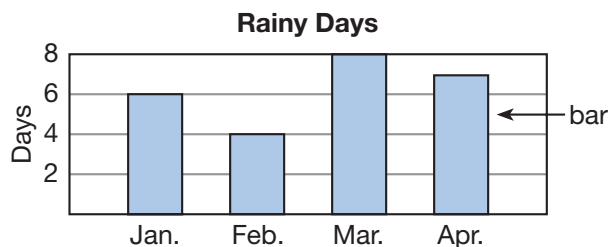
El **promedio** de 5, 6 y 10 es 7.

B

bar graph

(Inv. 6)

A graph that uses rectangles (bars) to show numbers or measurements.



This **bar graph** shows how many rainy days there were in each of these four months.

gráfica de barras

Una gráfica que utiliza rectángulos (barras) para mostrar números o medidas.

Esta **gráfica de barras** muestra cuántos días lluviosos hubo en cada uno de estos cuatro meses.

base

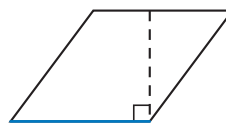
(62, 98)

1. The lower number in an exponential expression.

$$\text{base} \rightarrow 5^3 \leftarrow \text{exponent}$$

5^3 means $5 \times 5 \times 5$, and its value is 125.

2. A designated side or face of a geometric figure.



base

1. El número inferior en una expresión exponencial.

$$\text{base} \rightarrow 5^3 \leftarrow \text{exponente}$$

5^3 significa $5 \times 5 \times 5$, y su valor es 125.

2. Lado (o cara) determinado de una figura geométrica.

base-ten system

(Inv. 4)

A place-value system in which each place value is 10 times larger than the place value to its right.

*The decimal system is a **base-ten system**.*

sistema base diez

Un sistema de valor posicional en el cual cada valor posicional es 10 veces mayor que el valor posicional que está a su derecha.

*El sistema decimal es un **sistema base diez**.*

bias

(Inv. 7)

Favoring one choice over another in a survey.

“Which do you prefer with lunch: cool, sweet lemonade or milk that has been out of the refrigerator for an hour?”

*Words like “cool” and “sweet” **bias** this survey question to favor the choice of lemonade.*

sesgo

Dar preferencia a una opción más que a otras en una encuesta.

*“¿Qué prefieres tomar en tu almuerzo: una limonada dulce y fresca o leche que ha estado una hora fuera del refrigerador?” Palabras como “dulce” y “fresca” introducen **sesgo** en esta pregunta de encuesta para favorecer a la opción de limonada.*

borrowing

(15)

See **regrouping**.

tomar prestado

Ver reagrupar.

C

calendar

(54)

A chart that shows the days of the week and their dates.

SEPTEMBER 2007						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

calendar

calendario

Una tabla que muestra los días de la semana y sus fechas.

capacity

(18)

The amount of liquid a container can hold.

*Cups, gallons, and liters are units of **capacity**.*

capacidad

Cantidad de líquido que puede contener un recipiente.

*Tazas, galones y litros son medidas de **capacidad**.*

cardinal numbers

(5)

The counting numbers 1, 2, 3, 4,

números cardinales

Los números de conteo 1, 2, 3, 4,

Celsius

(18)

A scale used on some thermometers to measure temperature.

*On the **Celsius** scale, water freezes at 0°C and boils at 100°C.*

Celsius

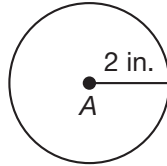
Escala que se usa en algunos termómetros para medir la temperatura.

*En la escala **Celsius**, el agua se congela a 0°C y hierve a 100°C.*

center

(21)

The point inside a circle from which all points on the circle are equally distant.



*The **center** of circle A is 2 inches from every point on the circle.*

centro

Punto interior de un círculo o esfera, que equidista de cualquier punto del círculo o de la esfera.

*El **centro** del círculo A está a 2 pulgadas de cualquier punto del círculo.*

centimeter

(Inv. 2)

One hundredth of a meter.

*The width of your little finger is about one **centimeter**.*

centímetro

Una centésima de un metro.

*El ancho de tu dedo meñique mide aproximadamente un **centímetro**.*

century

(54)

A period of one hundred years.

*The years 2001–2100 make up one **century**.*

siglo

Un período de cien años.

*Los años 2001–2100 forman un **siglo**.*

certain

(Inv. 10)

We say that an event is **certain** when the event's probability is 1. This means the event will definitely occur.

seguro

Decimos que un suceso es **seguro** cuando la probabilidad del suceso es 1. Esto significa que el suceso ocurrirá definitivamente.

chance

(Inv. 10)

A way of expressing the likelihood of an event; the probability of an event expressed as a percent.

*The **chance** of rain is 20%. It is not likely to rain.*

*There is a 90% **chance** of snow. It is likely to snow.*

posibilidad

Modo de expresar la probabilidad de ocurrencia de un suceso; la probabilidad de un suceso expresada como porcentaje.

*La **posibilidad** de lluvia es del 20%. Es poco probable que llueva.*

*Hay un 90% de **posibilidad** de nieve. Es muy probable que nieve.*

chronological order
(54)

The order of dates or times when listed from earliest to latest.

1951, 1962, 1969, 1973, 1981, 2001

*These years are listed in **chronological order**. They are listed from earliest to latest.*

orden cronológico

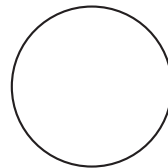
El orden de fechas o tiempos cuando se enlistan del más temprano al más tardío.

1952, 1962, 1969, 1973, 1981, 2001

*Estos años están listados en **orden cronológico**. Están listados del más temprano al más tardío.*

circle
(21)

A closed, curved shape in which all points on the shape are the same distance from its center.



circle

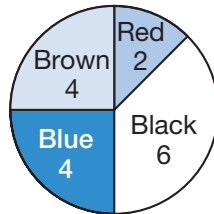
círculo

Una forma cerrada curva en la cual todos los puntos en la figura están a la misma distancia de su centro.

circle graph
(Inv. 6)

A graph made of a circle divided into sectors. Also called *pie chart* or *pie graph*.

Shoe Colors of Students



*This **circle graph** displays data on students' shoe color.*

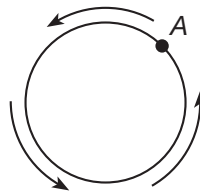
gráfica circular

Una gráfica que consiste de un círculo dividido en sectores.

*Esta **gráfica circular** representa los datos de los colores de los zapatos de los estudiantes.*

circumference
(21)

The distance around a circle; the perimeter of a circle.



*If the distance from point A around to point A is 3 inches, then the **circumference** of the circle is 3 inches.*

circunferencia

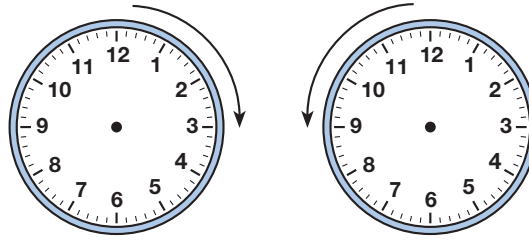
La distancia alrededor de un círculo; el perímetro de un círculo.

*Si la distancia desde el punto A alrededor del círculo hasta el punto A es 3 pulgadas, entonces la **circunferencia** o perímetro del círculo mide 3 pulgadas.*

clockwise

(75)

The same direction as the movement of a clock's hands.

**clockwise** turn

counterclockwise turn

en el sentido de las manecillas del reloj

La misma dirección que el movimiento de las manecillas de un reloj.

combinations

(36)

One or more parts selected from a set that are placed in groups in which order is not important.

Combinations of the letters *A, B, C, D, and E* are *AB, BC, CD, DE, AC, BD, CE, BE, and AE*.**combinaciones**

Una o más partes seleccionadas de un conjunto que son colocadas en grupos donde el orden no es importante.

common denominators

(116)

denominadores comunes

Denominators that are the same.

*The fractions $\frac{2}{5}$ and $\frac{3}{5}$ have **common denominators**.*

Denominadores que son iguales.

*Las fracciones $\frac{2}{5}$ y $\frac{3}{5}$ tienen **denominadores comunes**.*

common year

(54)

A year with 365 days; not a leap year.

*The year 2000 is a leap year, but 2001 is a **common year**. In a **common year** February has 28 days. In a leap year it has 29 days.***año común**

Un año con 365 días; no un año bisiesto.

*El año 2000 es un año bisiesto, pero 2001 es un **año común**. En un **año común** febrero tiene 28 días. En un año bisiesto tiene 29 días.*

Commutative Property of Addition

(1)

Changing the order of addends does not change their sum. In symbolic form, $a + b = b + a$. Unlike addition, subtraction is not commutative.

$$8 + 2 = 2 + 8$$

$$8 - 2 \neq 2 - 8$$

Addition is commutative. Subtraction is not commutative.**propiedad conmutativa de la suma**El orden de los sumandos no altera la suma. En forma simbólica, $a + b = b + a$. A diferencia de la suma, la resta no es conmutativa.

$$8 + 2 = 2 + 8$$

$$8 - 2 \neq 2 - 8$$

La suma es **conmutativa**.La resta no es **conmutativa**.

Commutative Property of Multiplication

(28)

Changing the order of factors does not change their product. In symbolic form, $a \times b = b \times a$. Unlike multiplication, division is not commutative.

$$8 \times 2 = 2 \times 8$$

$$8 \div 2 \neq 2 \div 8$$

*Multiplication is **commutative**. Division is not **commutative**.*

propiedad conmutativa de la multiplicación

El orden de los factores no altera el producto. En forma simbólica, $a \times b = b \times a$. A diferencia de la multiplicación, la división no es conmutativa.

$$8 \times 2 = 2 \times 8$$

$$8 \div 2 \neq 2 \div 8$$

La multiplicación es **conmutativa**.

La división no es **conmutativa**.

comparison symbol

(Inv. 1)

A mathematical symbol used to compare numbers.

Comparison symbols include the equal sign (=) and the “greater than/less than” symbols (> or <).

símbolo de comparación

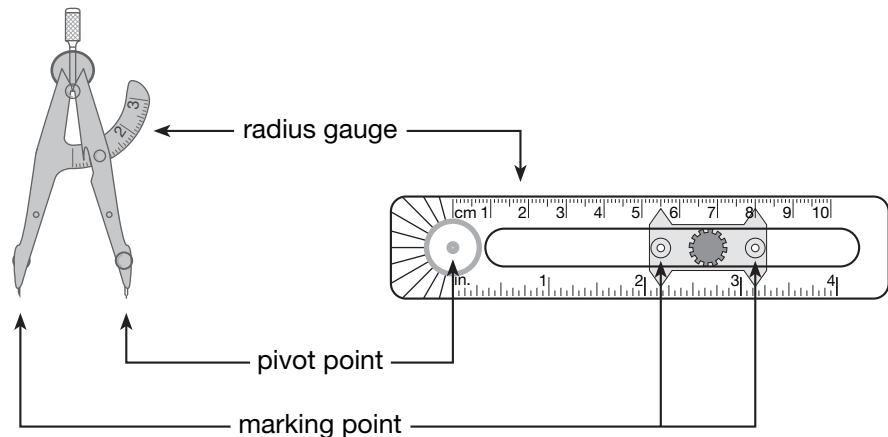
Un símbolo matemático que se usa para comparar números.

Los símbolos de comparación incluyen el signo de igualdad (=) y los símbolos de “mayor que/menor que” (> ó <).

compass

(21)

A tool used to draw circles and arcs.



two types of **compasses**

compás

Instrumento para dibujar círculos y arcos.

compatible numbers

(22)

Numbers that are close in value to the actual numbers and are easy to add, subtract, multiply, or divide.

números compatibles

Números que tienen un valor cercano a los números reales y que son fáciles de sumar, restar, multiplicar, o dividir.

composite numbers

(55)

A counting number greater than 1 that is divisible by a number other than itself and 1. Every composite number has three or more factors. Every composite number can be expressed as a product of two or more prime numbers.

*9 is divisible by 1, 3, and 9. It is **composite**.*

*11 is divisible by 1 and 11. It is not **composite**.*

números compuestos

Un número de conteo mayor que 1, divisible entre algún otro número distinto de sí mismo y de 1. Cada número compuesto tiene tres o más factores. Cada número de conteo puede ser expresado como el producto de dos o más números primos.

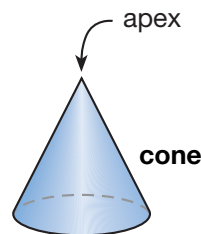
*9 es divisible entre 1, 3 y 9. Es **compuesto**.*

*11 es divisible entre 1 y 11. No es **compuesto**.*

cone

(98)

A three-dimensional solid with one curved surface and one flat, circular surface. The pointed end of a cone is its apex.



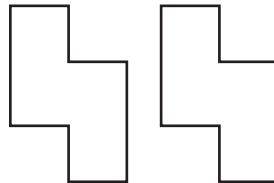
cono

Un sólido tridimensional con una superficie curva y una superficie plana y circular. El extremo puntiagudo de un cono es su ápice.

congruent

(56)

Having the same size and shape.



*These polygons are **congruent**.
They have the same size and
shape.*

congruentes

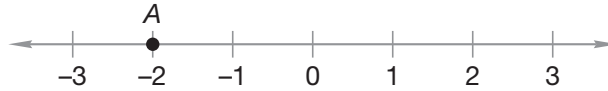
Que tienen igual tamaño y forma.

*Estos polígonos son **congruentes**. Tienen igual tamaño y forma.*

coordinate(s)

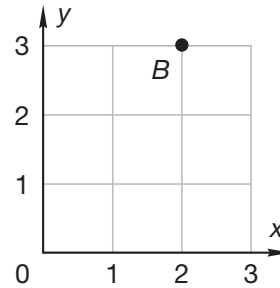
(Inv. 8)

1. A number used to locate a point on a number line.



The **coordinate** of point A is -2 .

2. A pair of numbers used to locate a point on a coordinate plane.



The **coordinates** of point B are $(2, 3)$. The *x*-coordinate is listed first, and the *y*-coordinate is listed second.

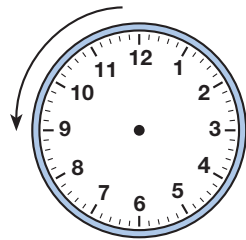
coordenada(s)

1. Número que se utiliza para ubicar un punto sobre una recta numérica.
La **coordenada** del punto A es -2 .
2. Par ordenado de números que se utiliza para ubicar un punto sobre un plano coordenado.
Las **coordenadas** del punto B son $(2, 3)$. La coordenada *x* se escribe primero, seguida de la coordenada *y*.

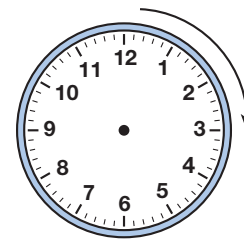
counter-clockwise

(75)

The direction opposite of the movement of a clock's hands.



counterclockwise turn



clockwise turn

en sentido contrario a las manecillas del reloj

La dirección opuesta al movimiento de las manecillas de un reloj.

counting numbers

(3)

The numbers used to count; the numbers in this sequence: 1, 2, 3, 4, 5, 6, 7, 8, 9, ...

The numbers 12 and 37 are **counting numbers**, but 0.98 and $\frac{1}{2}$ are not.

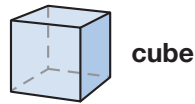
números de conteo

Números que se utilizan para contar; los números en esta secuencia: 1, 2, 3, 4, 5, 6, 7, 8, 9, ...

Los números 12 y 37 son **números de conteo**, pero 0.98 y $\frac{1}{2}$ no son **números de conteo**.

cube
(98)

A three-dimensional solid with six square faces. Adjacent faces are perpendicular and opposite faces are parallel.

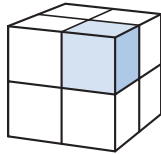


cubo

Un sólido tridimensional con seis caras cuadradas. Las caras adyacentes son perpendiculares y las caras opuestas son paralelas.

cubic unit
(Inv. 11)

A cube with edges of designated length. Cubic units are used to measure volume.



*The shaded part is 1 **cubic unit**. The volume of the large cube is 8 **cubic units**.*

unidad cúbica

Un cubo con aristas de una longitud designada. Las unidades cúbicas se usan para medir volumen.

*La parte sombreada tiene 1 **unidad cúbica**. El volumen del cubo mayor es de 8 **unidades cúbicas**.*

cylinder
(98)

A three-dimensional solid with two circular bases that are opposite and parallel to each other.



cilindro

Un sólido tridimensional con dos bases circulares que son opuestas y paralelas entre sí.

D

data
(Inv. 7)

(Singular: *datum*) Information gathered from observations or calculations.

82, 76, 95, 86, 98, 97, 93

*These **data** are average daily temperatures for one week in Utah.*

datos

Información reunida de observaciones o cálculos.

*Estos **datos** son el promedio diario de las temperaturas de una semana en Utah.*

decade
(54)

A period of ten years.

*The years 2001–2010 make up one **decade**.*

década

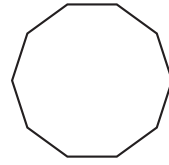
Un periodo de diez años.

*Los años 2001–2010 forman una **década**.*

decagon

(63)

A polygon with ten sides.



decagon

decágono

Un polígono de diez lados.

decimal number

(Inv. 4)

A numeral that contains a decimal point.

*23.94 is a **decimal number** because it contains a decimal point.*

número decimal

Número que contiene un punto decimal.

*23.94 es un **número decimal**, porque tiene punto decimal.*

decimal place(s)

(Inv. 4)

Places to the right of a decimal point.

*5.47 has two **decimal places**.*

*6.3 has one **decimal place**.*

*8 has no **decimal places**.*

cifras decimales

Lugares ubicados a la derecha del punto decimal.

*5.47 tiene dos **cifras decimales**.*

*6.3 tiene una **cifra decimal**.*

*8 no tiene **cifras decimales**.*

decimal point

(22)

A symbol used to separate the ones place from the tenths place in decimal numbers (or dollars from cents in money).

34.15



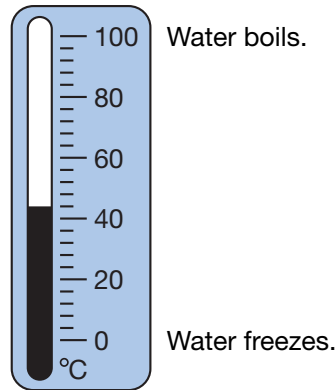
decimal point

punto decimal

Un símbolo que se usa para separar el lugar de las unidades del lugar de las décimas en números decimales (o los dólares de los centavos en dinero).

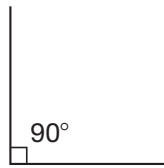
degree (°)
(18, 75)

1. A unit for measuring temperature.



*There are 100 **degrees** (100°) between the freezing and boiling points of water on the Celsius scale.*

2. A unit for measuring angles.



*There are 90 **degrees** (90°) in a right angle.*

grado (°)

1. Unidad para medir temperatura.

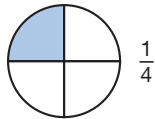
*Hay 100 **grados** de diferencia entre los puntos de ebullición y congelación del agua en la escala Celsius, o escala centígrada.*

2. Unidad para medir ángulos.

*Un ángulo recto mide 90 **grados** (90°).*

denominator
(22)

The bottom number of a fraction; the number that tells how many parts are in a whole.



*The **denominator** of the fraction is 4.
There are 4 parts in the whole circle.*

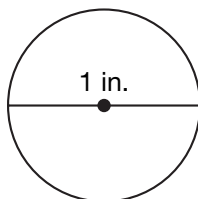
denominador

El número inferior de una fracción; el número que indica cuántas partes hay en un entero.

*El **denominador** de la fracción es 4. Hay 4 partes en el círculo completo.*

diameter
(21)

The distance across a circle through its center.



*The **diameter** of this circle is 1 inch.*

diámetro

Distancia que atraviesa un círculo a través de su centro.

*El **diámetro** de este círculo mide 1 pulgada.*

difference⁽⁶⁾

The result of subtraction.

$$12 - 8 = 4 \quad \text{The **difference** in this problem is 4.}$$

diferencia

Resultado de una resta.

$$12 - 8 = 4 \quad \text{La **diferencia** en este problema es 4.}$$

digit⁽³⁾

Any of the symbols used to write numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

*The last **digit** in the number 2587 is 7.*

dígito

Cualquiera de los símbolos que se utilizan para escribir números: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

*El último **dígito** del número 2587 es 7.*

digital form⁽¹⁹⁾

When referring to clock time, digital form is a way to write time that uses a colon and a.m. or p.m.

*11:30 a.m. is **digital form**.*

forma digital

Cuando nos referimos al tiempo marcado por un reloj, la forma digital es una manera de escribir tiempo que usa dos puntos y a.m. o p.m.

*11:30 a.m. está en **forma digital**.*

Distributive Property⁽¹⁰⁸⁾

A number times the sum of two addends is equal to the sum of that same number times each individual addend.

$$a \times (b + c) = (a \times b) + (a \times c)$$

$$8 \times (2 + 3) = (8 \times 2) + (8 \times 3)$$

$$8 \times 5 = 16 + 24$$

$$40 = 40$$

*Multiplication is **distributive** over addition.*

propiedad distributiva

Un número multiplicado por la suma de dos sumandos es igual a la suma de los productos de ese número por cada uno de los sumandos.

$$a \times (b + c) = (a \times b) + (a \times c)$$

$$8 \times (2 + 3) = (8 \times 2) + (8 \times 3)$$

$$8 \times 5 = 16 + 24$$

$$40 = 40$$

*La multiplicación es **distributiva** con respecto a la suma.*

dividend⁽⁶⁵⁾

A number that is divided.

$$12 \div 3 = 4 \quad 3 \overline{)12} \quad \frac{12}{3} = 4 \quad \text{The **dividend** is 12 in each of these problems.}$$

dividendo

Número que se divide.

$$12 \div 3 = 4 \quad 3 \overline{)12} \quad \frac{12}{3} = 4 \quad \text{El **dividendo** es 12 en cada una de estas operaciones.}$$

divisible

(55)

Able to be divided by a whole number without a remainder.

$$\begin{array}{r} 5 \\ 4 \overline{)20} \end{array}$$

The number 20 is **divisible** by 4, since $20 \div 4$ has no remainder.

$$\begin{array}{r} 6 R 2 \\ 3 \overline{)20} \end{array}$$

The number 20 is not **divisible** by 3, since $20 \div 3$ has a remainder.

divisible

Número que se puede dividir exactamente por un entero, es decir, sin residuo.

$$\begin{array}{r} 5 \\ 4 \overline{)20} \end{array}$$

El número 20 es **divisible** entre 4, ya que $20 \div 4$ no tiene residuo.

$$\begin{array}{r} 6 R 2 \\ 3 \overline{)20} \end{array}$$

El número 20 no es **divisible** entre 3, ya que $20 \div 3$ tiene residuo.

division

(46)

An operation that separates a number into a given number of equal parts or into a number of parts of a given size.

$$21 \div 3 = 7$$

We use **division** to separate 21 into 3 groups of 7.

división

Una operación que separa un número en un número dado de partes iguales o en un número de partes de una medida dada.

Usamos la **división** para separar 21 en 3 grupos de 7.

divisor

(65)

A number by which another number is divided.

$$12 \div 3 = 4$$

$$\begin{array}{r} 4 \\ 3 \overline{)12} \end{array}$$

$$\frac{12}{3} = 4$$

The **divisor** is 3 in each of these problems.

divisor

Número que divide a otro en una división.

$$12 \div 3 = 4$$

$$\begin{array}{r} 4 \\ 3 \overline{)12} \end{array}$$

$$\frac{12}{3} = 4$$

El **divisor** es 3 en cada una de estas operaciones.

dozen

(49)

A group of twelve.

The carton holds a **dozen** eggs.

The carton holds 12 eggs.

docena

Un grupo de doce.

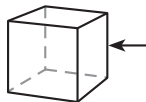
El cartón contiene una **docena** de huevos.

El cartón contiene 12 huevos.

E**edge**

(98)

A line segment formed where two faces of a solid intersect.



The arrow is pointing to one **edge** of this cube. A cube has 12 **edges**.

arista

Segmento de recta formado donde se intersecan dos caras de un sólido.

La flecha apunta hacia una **arista** de este cubo. Un cubo tiene 12 **aristas**.

elapsed time

(19)

The difference between a starting time and an ending time.

*The race started at 6:30 p.m. and finished at 9:12 p.m. The **elapsed time** of the race was 2 hours 42 minutes.*

tiempo transcurrido

La diferencia entre el tiempo de comienzo y tiempo final.

*La carrera comenzó a las 6:30 p.m. y terminó a las 9:12 p.m. El **tiempo transcurrido** de la carrera fue de 2 horas 42 minutos.*

endpoint(s)

(23)

The point(s) at which a line segment ends.



*Points A and B are the **endpoints** of line segment AB.*

punto(s) extremo(s)

Punto(s) donde termina un segmento de recta.

*Los puntos A y B son los **puntos extremos** del segmento AB.*

equals

(Inv. 1)

Has the same value as.

*12 inches **equals** 1 foot.*

es igual a

Con el mismo valor.

*12 pulgadas **es igual a** 1 pie.*

equation

(2)

A number sentence that uses an equal sign (=) to show that two quantities are equal.

$$x = 3 \quad 3 + 7 = 10 \quad 4 + 1 \quad x < 7$$

equations **not equations**

ecuación

Enunciado que usa el símbolo de igualdad (=) para indicar que dos cantidades son iguales.

$$x = 3 \quad 3 + 7 = 10 \quad 4 + 1 \quad x < 7$$

son ecuaciones **no son ecuaciones**

equiangular

(78)

A figure with angles of the same measurement.

*An equilateral triangle is also **equiangular** because its angles each measure 60° .*

equiangular

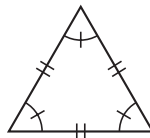
Una figura con ángulos de la misma medida.

*Un triángulo equilátero es también **equiangular** porque sus tres ángulos miden 60° .*

equilateral triangle

(21)

A triangle in which all sides are the same length and all angles are the same measure.



*This is an **equilateral triangle**. All of its sides are the same length. All of its angles are the same measure.*

triángulo equilátero

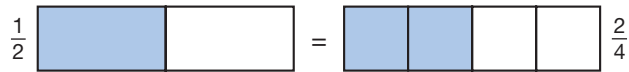
Triángulo que tiene todos sus lados de la misma longitud.

*Éste es un **triángulo equilátero**. Sus tres lados tienen la misma longitud. Todos sus ángulos miden lo mismo.*

equivalent fractions

(109)

Different fractions that name the same amount.



$\frac{1}{2}$ and $\frac{2}{4}$ are **equivalent fractions**.

fracciones equivalentes

Fracciones diferentes que representan la misma cantidad.

$\frac{1}{2}$ y $\frac{2}{4}$ son **fracciones equivalentes**.

estimate

(22)

To find an approximate value.

*I **estimate** that the sum of 203 and 304 is about 500.*

estimar

Encontrar un valor aproximado.

Puedo **estimar** que la suma de 199 más 205 es aproximadamente 400.

evaluate

(106)

To find the value of an expression.

*To **evaluate** $a + b$ for $a = 7$ and $b = 13$, we replace a with 7 and b with 13:*

$$7 + 13 = 20$$

evaluar

Calcular el valor de una expresión.

Para **evaluar** $a + b$, con $a = 7$ y $b = 13$, se reemplaza a por 7 y b por 13:

$$7 + 13 = 20$$

even numbers

(10)

Numbers that can be divided by 2 without a remainder; the numbers in this sequence: 0, 2, 4, 6, 8, 10, ...

***Even numbers** have 0, 2, 4, 6, or 8 in the ones place.*

números pares

Números que se pueden dividir entre 2 sin residuo; los números en esta secuencia: 0, 2, 4, 6, 8, 10, ...

Los **números pares** terminan en 0, 2, 4, 6 u 8 en el lugar de las unidades.

exchanging

(15)

See **regrouping**.

cambiar

Ver **reagrupar**.

expanded form

(16)

A way of writing a number that shows the value of each digit.

*The **expanded form** of 234 is $200 + 30 + 4$.*

forma desarrollada

Una manera de escribir un número mostrando el valor de cada dígito.

La **forma desarrollada** de 234 es $200 + 30 + 4$.

exponent

(62)

The upper number in an exponential expression; it shows how many times the base is to be used as a factor.

$$\text{base} \longrightarrow 5^3 \longleftarrow \text{exponent}$$

5^3 means $5 \times 5 \times 5$, and its value is 125.

exponente

El número superior en una expresión exponencial; muestra cuántas veces debe usarse la base como factor.

$$\text{base} \longrightarrow 5^3 \longleftarrow \text{exponente}$$

5^3 significa $5 \times 5 \times 5$, y su valor es 125.

exponential expression

(62)

An expression that indicates that the base is to be used as a factor the number of times shown by the exponent.

$$4^3 = 4 \times 4 \times 4 = 64$$

*The **exponential expression** 4^3 uses 4 as a factor 3 times. Its value is 64.*

expresión exponencial

Expresión que indica que la base debe usarse como factor el número de veces que indica el exponente.

$$4^3 = 4 \times 4 \times 4 = 64$$

*La **expresión exponencial** 4^3 se calcula usando 3 veces el 4 como factor. Su valor es 64.*

expression

(6)

A number, a letter, or a combination of both. Expressions do not include comparison symbols, such as an equal sign.

*$3n$ is an **expression** that can also be written as $3 \times n$.*

expresión

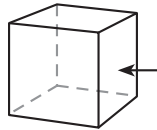
Un número, una letra o una combinación de los dos.

*Las **expresiones** no incluyen símbolos de comparación, como el signo de igual. $3n$ es una **expresión** que también puede ser escrita como $3 \times n$.*

F**face**

(98)

A flat surface of a geometric solid.



*The arrow is pointing to one **face** of the cube. A cube has six **faces**.*

cara

Superficie plana de un cuerpo geométrico.

*La flecha apunta a una **cara** del cubo. Un cubo tiene seis **caras**.*

fact family

(6)

A group of three numbers related by addition and subtraction or by multiplication and division.

*The numbers 3, 4, and 7 are a **fact family**. They make these four facts:*

$$3 + 4 = 7 \quad 4 + 3 = 7 \quad 7 - 3 = 4 \quad 7 - 4 = 3$$

familia de operaciones

Grupo de tres números relacionados por sumas y restas o por multiplicaciones y divisiones.

*Los números 3, 4 y 7 forman una **familia de operaciones**. Con ellos se pueden formar estas cuatro operaciones:*

$$3 + 4 = 7 \quad 4 + 3 = 7 \quad 7 - 3 = 4 \quad 7 - 4 = 3$$

factor

(28)

Any one of the numbers multiplied in a multiplication problem.

$$2 \times 3 = 6 \quad \text{The **factors** in this problem are 2 and 3.}$$

factor

Cualquier número que se multiplica en un problema de multiplicación.

$$2 \times 3 = 6 \quad \text{Los **factores** en este problema son 2 y 3.}$$

Fahrenheit

(18)

A scale used on some thermometers to measure temperature.

*On the **Fahrenheit** scale, water freezes at 32°F and boils at 212°F.*

Fahrenheit

Escala que se usa en algunos termómetros para medir la temperatura.

*En la **escala Fahrenheit**, el agua se congela a 32°F y hierve a 212°F.*

fluid ounce

(18)

A unit of liquid measurement in the customary system.

*There are 8 **fluid ounces** in a cup, 16 **fluid ounces** in a pint, and 32 **fluid ounces** in a quart.*

onza líquida (oz. liq.)

Una unidad de medida para líquidos en el sistema usual.

*Hay 8 **onzas líquidas** en una taza, 16 **onzas líquidas** en una pinta y 32 **onzas líquidas** en un cuarto.*

formula

(1)

An expression or equation that describes a method for solving a certain type of problem. We often write formulas with letters that stand for complete words.

*A **formula** for the perimeter of a rectangle is $P = 2l + 2w$, where P stands for “perimeter,” l stands for “length,” and w stands for “width.”*

fórmula

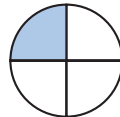
Una expresión o ecuación que describe un método para resolver cierto tipo de problemas. Frecuentemente escribimos **fórmulas** con letras que representan palabras completas.

*Una **fórmula** para el perímetro del rectángulo es $P = 2l + 2w$, donde P representa “perímetro”, l representa “longitud” y w representa “ancho”.*

fraction

(22)

A number that names part of a whole.



$\frac{1}{4}$ of the circle is shaded.

$\frac{1}{4}$ is a **fraction**.

fracción

Número que representa una parte de un entero.

$\frac{1}{4}$ del círculo está sombreado.
 $\frac{1}{4}$ es una **fracción**.

full turn

(75)

A turn measuring 360°.

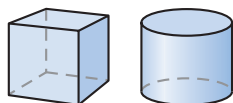
giro completo

Giro que mide 360°.

G**geometric solid**

(98)

A shape that takes up space.

geometric solids

cube

cylinder

not geometric solids

circle

rectangle

hexagon

sólido geométrico

Una figura que ocupa espacio.

geometry

(73)

A major branch of mathematics that deals with shapes, sizes, and other properties of figures.

*Some of the figures we study in **geometry** are angles, circles, and polygons.*

geometría

Rama importante de las matemáticas, que trata de las formas, tamaños y otras propiedades de las figuras.

*Algunas de las figuras que se estudian en **geometría** son los ángulos, círculos y polígonos.*

graph

(Inv. 6)

A diagram that shows data in an organized way. *See also* **bar graph, circle graph, line graph, and pictograph.**

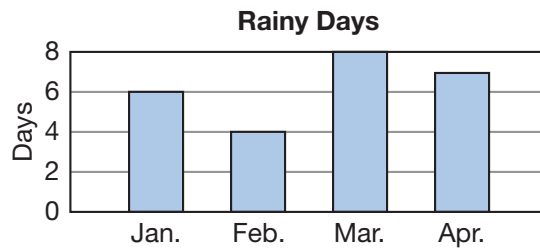
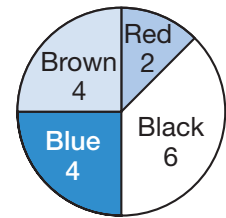
**bar graph****Shoe Colors of Students****circle graph****gráfica**

Diagrama que muestra datos de una forma organizada. *Ver también gráfica de barras, gráfica circular, gráfica lineal, y pictograma.*

greater than

(Inv. 1)

Having a larger value than.

$5 > 3$ *Five is **greater than** three.*

mayor que

Que tiene un valor mayor que.

$5 > 3$ *Cinco es **mayor que** tres.*

H**half**

(22)

One of two equal parts that together equal a whole.

mitad

Una de dos partes iguales que juntas forman un entero.

half turn

(75)

A turn measuring 180° .

medio giro

Un giro que mide 180° .

hexagon

(63)

A polygon with six sides.

**hexagon****hexágono**

Un polígono con seis lados.

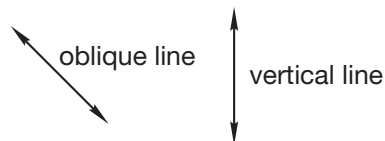
horizontal

(23)

Side to side; perpendicular to vertical.



horizontal line



not horizontal lines

horizontal

Lado a lado; perpendicular a la vertical.

hundredth(s)

(Inv. 4)

One of one hundred parts.

The decimal form of one hundredth is 0.01.

centésima(s)

Una de cien partes.

La forma decimal de una centésima es 0.01.

I**Identity Property of Addition**

(1)

The sum of any number and 0 is equal to the initial number. In symbolic form, $a + 0 = a$. The number 0 is referred to as the *additive identity*.

The Identity Property of Addition is shown by this statement:

$$13 + 0 = 13$$

propiedad de identidad de la suma

La suma de cualquier número más 0 es igual al número inicial. En forma simbólica, $a + 0 = a$. El número 0 se conoce como *identidad aditiva*.

La propiedad de identidad de la suma se muestra en el siguiente enunciado:

$$13 + 0 = 13$$

Identity Property of Multiplication

(28)

The product of any number and 1 is equal to the initial number. In symbolic form, $a \times 1 = a$. The number 1 is referred to as the *multiplicative identity*.

The Identity Property of Multiplication is shown by this statement:

$$94 \times 1 = 94$$

propiedad de identidad de la multiplicación

El producto de cualquier número por 1 es igual al número inicial. En forma simbólica, $a \times 1 = a$. El número 1 se conoce como *identidad multiplicativa*.

La propiedad de identidad de la multiplicación se muestra en el siguiente enunciado:

$$94 \times 1 = 94$$

improper fraction

(89)

A fraction with a numerator greater than or equal to the denominator.

$\frac{4}{3}$ $\frac{2}{2}$ *These fractions are improper fractions.*

fracción impropia

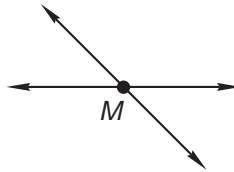
Fracción con el numerador igual o mayor que el denominador.

$\frac{4}{3}$ $\frac{2}{2}$ *Estas fracciones son fracciones impropias.*

intersect

(23)

To share a common point or points.



These two lines **intersect**.
They share the common point M.

intersecar

Compartir uno o varios puntos en común.

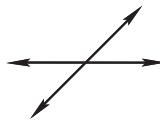
Estas dos rectas se **intersecan**.

Tienen el punto común M.

intersecting lines

(23)

Lines that cross.

**intersecting lines****líneas que se cruzan o intersecan**

Líneas que se cruzan.

inverse operation(s)

(24)

An operation that undoes another.

*Subtraction is the **inverse operation** of addition.*

operaciones inversas

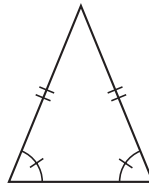
Una operación que cancela a otra.

La resta es la **operación inversa** de la suma.

isosceles triangle

(78)

A triangle with at least two sides of equal length and two angles of equal measure.



*Two of the sides of
this **isosceles triangle**
have equal lengths.
Two of the angles have
equal measures.*

triángulo isósceles

Triángulo que tiene por lo menos dos lados de igual longitud y dos ángulos de igual medida.

*Dos de los lados de este **triángulo isósceles** tienen igual longitud.*

Dos de los ángulos tienen medidas iguales.

K**key**

(Inv. 6)

See legend.

clave

Ver rótulo.

kilometer

(Inv. 2)

A metric unit of length equal to 1000 meters.

*One **kilometer** is approximately 0.62 mile.*

kilómetro

Una unidad métrica de longitud igual a 1000 metros.

*Un **kilómetro** es aproximadamente 0.62 milla.*

L

leap year
(54)

A year with 366 days; not a common year.

*In a **leap year**, February has 29 days.*

año bisiesto

Un año con 366 días; no un año común.

*En un **año bisiesto** febrero tiene 29 días.*

least common denominator (LCD)
(116)

The least common multiple of the denominators of two or more fractions.

*The **least common denominator** of $\frac{5}{6}$ and $\frac{3}{8}$ is the least common multiple of 6 and 8, which is 24.*

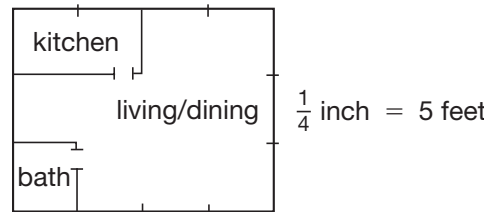
mínimo común denominador (mcd)

El mínimo común múltiplo de los denominadores de dos o más fracciones.

*El **mínimo común denominador** de $\frac{5}{6}$ y $\frac{3}{8}$ es el mínimo común múltiplo de 6 y 8, que es 24.*

legend
(Inv. 6)

A notation on a map, graph, or diagram that describes the meaning of the symbols and/or the scale used.



*The **legend** of this scale drawing shows that $\frac{1}{4}$ inch represents 5 feet.*

rótulo

Una anotación en un mapa, gráfica o diagrama que describe el significado de los símbolos y/o la escala usada.

*El **rótulo** en el dibujo de esta escala muestra que $\frac{1}{4}$ de pulgada representa 5 pies.*

less than
(Inv. 1)

Having a smaller value than.

$3 < 5$ *Three is **less than** five.*

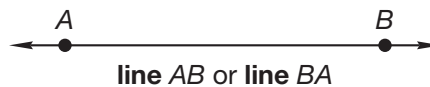
menor que

Con un valor menor que.

$3 < 5$ *Tres es **menor que** cinco.*

line
(Inv. 1)

A straight collection of points extending in opposite directions without end.



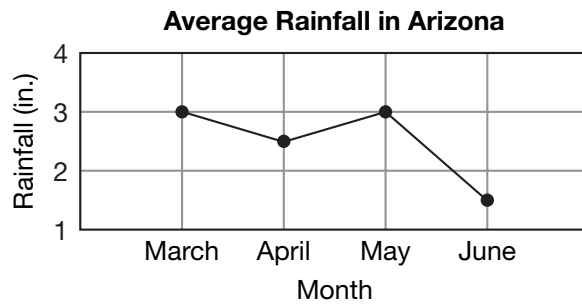
recta

Un grupo de puntos en línea recta que se extienden sin fin en direcciones opuestas.

line graph

(Inv. 6)

A graph that connects points to show how information changes over time.



This **line graph** shows the average rainfall in Arizona over four months.

gráfica lineal

Una gráfica que conecta puntos para mostrar como la información cambia con el tiempo.

Esta **gráfica lineal** muestra el promedio de lluvias en Arizona en un periodo de cuatro meses.

line of symmetry

(79)

A line that divides a figure into two halves that are mirror images of each other. See also **symmetry**.

**lines of symmetry****not lines of symmetry****eje de simetría**

Una línea que divide una figura en dos mitades que son imágenes especulares una de otra. Ver también **simetría**.

line segment

(Inv. 1)

A part of a line with two distinct endpoints.



\overline{AB} is a **line segment**.

segmento de recta

Una parte de una línea con dos extremos específicos.

\overline{AB} es un **segmento de recta**.

liter

(18)

A metric unit of capacity or volume.

A **liter** is a little more than a quart.

litro

Una unidad métrica de capacidad o volumen.

Un **litro** es un poco más que un cuarto.

lowest terms

(Inv. 9)

A fraction is in *lowest terms* if it cannot be reduced.

In **lowest terms**, the fraction $\frac{8}{20}$ is $\frac{2}{5}$.

mínima expresión

Una fracción está en su mínima expresión si no se puede reducir.

En su **mínima expresión** la fracción $\frac{8}{20}$ es $\frac{2}{5}$.

M

mass
(77)

The amount of matter an object contains. A kilogram is a metric unit of mass.

*The **mass** of a bowling ball would be the same on the moon as on Earth, even though the weight of the bowling ball would be different.*

masa

La cantidad de materia que contiene un objeto. Un kilogramo es una unidad métrica de masa.

*La **masa** de una bola de boliche es la misma en la Luna que en la Tierra. Aunque el peso de la bola de boliche es diferente.*

mean
(97)

See **average**.

media

Ver **promedio**.

median
(97)

The middle number (or the average of the two central numbers) of a list of data when the numbers are arranged in order from the least to the greatest.

1, 1, 2, 4, 5, 7, 9, 15, 24, 36, 44

*In this list of data, 7 is the **median**.*

mediana

Número que está en medio (o el promedio de los dos números centrales) en una lista de datos, cuando los números se ordenan de menor a mayor.

1, 1, 2, 4, 5, 7, 9, 15, 24, 36, 44

*En esta lista de datos, 7 es la **mediana**.*

meter
(Inv. 2)

The basic unit of length in the metric system.

*A **meter** is equal to 100 centimeters, and it is slightly longer than 1 yard.*

*Many classrooms are about 10 **meters** long and 10 **meters** wide.*

metro

La unidad básica de longitud en el sistema métrico

*Un **metro** es igual a 100 centímetros y es un poco más largo que una yarda.*

*Muchos salones de clase son de alrededor de 10 **metros** de largo y 10 **metros** de ancho.*

metric system
(Inv. 2)

An international system of measurement in which units are related by a power of ten. Also called the *International System*.

*Centimeters and kilograms are units in the **metric system**.*

sistema métrico

Un sistema internacional de medidas en donde las unidades se relacionan con una potencia de diez. También llamado el *Sistema internacional*.

*Los centímetros y los kilogramos son unidades del **sistema métrico**.*

midnight
(19)

12:00 a.m.

***Midnight** is one hour after 11 p.m.*

medianoche

12:00 a.m.

*La **medianoche** es una hora después de las 11 p.m.*

mill

(91)

An amount of money equal to one thousandth of a dollar (one tenth of a penny).

The gasoline price of \$3.199 per gallon equals \$3.19 plus 9 mills.

mil (milésima parte de un dólar)

Una cantidad de dinero igual a una milésima de un dólar (una décima de una moneda de un centavo).

El precio de la gasolina es de \$3.199 por galón igual a \$3.19 más 9 milésimas de dólar.

millimeter

(Inv. 2)

A metric unit of length.

There are 1000 millimeters in 1 meter and 10 millimeters in 1 centimeter.

milímetro

Una unidad métrica de longitud

Hay 1000 milímetros en 1 metro y 10 milímetros en 1 centímetro.

mixed number

(35)

A number expressed as a whole number plus a fraction.

The mixed number $5\frac{3}{4}$ means "five and three fourths."

número mixto

Un número expresado como un número entero más una fracción.

El número mixto $5\frac{3}{4}$ significa "cinco y tres cuartos."

mode

(97)

The number or numbers that appear most often in a list of data.

5, 12, 32, 5, 16, 5, 7, 12

In this list of data, the number 5 is the mode.

moda

Número o números que aparecen con más frecuencia en una lista de datos.

5, 12, 32, 5, 16, 5, 7, 12

En esta lista de datos, el número 5 es la moda.

multiple

(20)

A product of a counting number and another number.

The multiples of 3 include 3, 6, 9, and 12.

múltiplo

Producto de un número de conteo y otro número.

Los múltiplos de 3 incluyen 3, 6, 9 y 12.

multiplication

(27)

An operation that uses a number as an addend a specified number of times.

$7 \times 3 = 21$

$7 + 7 + 7 = 21$

We can use multiplication to

use 7 as an addend 3 times.

multiplicación

Una operación que usa un número como sumando un número específico de veces.

$7 \times 3 = 21$

$7 + 7 + 7 = 21$

Podemos usar la multiplicación para usar

el 7 como sumando 3 veces.

multiplication table

(28)

A table used to find the product of two numbers. The product of two numbers is found at the intersection of the row and the column for the two numbers.

tabla de multiplicación

Una tabla que se usa para encontrar el producto de dos números. El producto de dos números se encuentra en la intersección de la fila y la columna para los dos números.

N

negative numbers

(Inv. 1)

Numbers less than zero.

*–15 and –2.86 are **negative numbers**.*

*19 and 0.74 are not **negative numbers**.*

números negativos

Los números menores que cero.

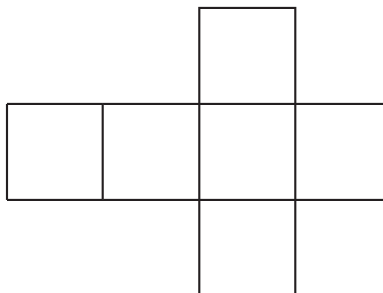
*–15 y –2.86 son **números negativos**.*

*19 y 0.74 no son **números negativos**.*

net

(99)

An arrangement of edge-joined polygons that can be folded to become the faces of the geometric solid.



red

Un arreglo de polígonos unidos por el borde que pueden ser doblados para convertirse en las caras de un sólido geométrico.

noon

(19)

12:00 p.m.

***Noon** is one hour after 11 a.m.*

mediodía

12:00 p.m.

***Mediodía** es una hora después de las 11 a.m.*

number line

(Inv. 1)

A line for representing and graphing numbers. Each point on the line corresponds to a number.



recta numérica

Recta para representar y graficar números. Cada punto de la recta corresponde a un número.

number sentence

(1)

A complete sentence that uses numbers and symbols instead of words. See also **equation**.

*The **number sentence** $4 + 5 = 9$ means “four plus five equals nine.”*

enunciado numérico

Un enunciado completo que usa números y símbolos en lugar de palabras. Ver también **ecuación**.

*El **enunciado numérico** $4 + 5 = 9$ significa “cuatro más cinco es igual a nueve”.*

numeral

(Appendix A)

A symbol or group of symbols that represents a number.

*4, 72, and $\frac{1}{2}$ are examples of **numerals**.*

*“Four,” “seventy-two,” and “one half” are words that name numbers but are not **numerals**.*

numeral

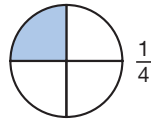
Símbolo, o grupo de símbolos numéricos, que representa un número.

*4, 72 y $\frac{1}{2}$ son ejemplos de **numerales**. “Cuatro”, “setenta y dos” y “un medio” son palabras que identifican números, pero no son **numerales**.*

numerator

(22)

The top number of a fraction; the number that tells how many parts of a whole are counted.



*The **numerator** of the fraction is 1. One part of the whole circle is shaded.*

numerador

El término superior de una fracción. El número que nos dice cuantas partes de un entero se cuentan.

*El **numerador** de la fracción es 1.*

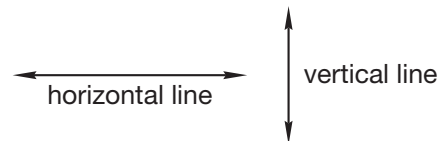
Una parte del círculo completo esta sombreada.

O

oblique

(23)

Slanted or sloping; not horizontal or vertical.

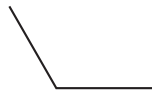
**oblique** linenot **oblique** lines**oblicuo**

Sesgado o inclinado; no horizontal o vertical.

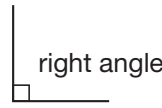
obtuse angle

(23)

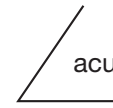
An angle whose measure is more than 90° and less than 180° .



obtuse angle



right angle



acute angle

not **obtuse angles**

*An **obtuse angle** is larger than both a right angle and an acute angle.*

ángulo obtuso

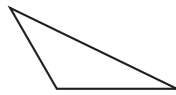
Ángulo que mide más de 90° y menos de 180° .

*Un **ángulo obtuso** es más grande que un ángulo recto y que un ángulo agudo.*

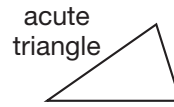
obtuse triangle

(78)

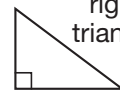
A triangle whose largest angle measures more than 90° and less than 180° .



obtuse triangle



acute triangle



right triangle

not **obtuse triangles**

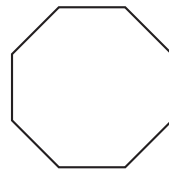
triángulo obtusángulo

Triángulo cuyo ángulo mayor mide más que 90° y menos que 180° .

octagon

(63)

A polygon with eight sides.



octagon

octágono

Un polígono con ocho lados.

odd numbers

(10)

Numbers that have a remainder of 1 when divided by 2; the numbers in this sequence: 1, 3, 5, 7, 9, 11, ...

***Odd numbers** have 1, 3, 5, 7, or 9 in the ones place.*

números impares

Números que cuando se dividen entre 2 tienen residuo de 1; los números en esta secuencia: 1, 3, 5, 7, 9, 11...

*Los **números impares** tienen 1, 3, 5, 7 ó 9 en el lugar de las unidades.*

order of operations

(45)

The set of rules for the order in which to solve math problems.

*Following the **order of operations**, we multiply and divide within an expression before we add and subtract.*

orden de operaciones

El conjunto de reglas del orden para resolver problemas matemáticos.

*Siguiendo el **orden de operaciones** multiplicamos y dividimos dentro de la expresión antes de sumar y restar.*

ordinal numbers

(5)

Numbers that describe position or order.

*"First," "second," and "third" are **ordinal numbers**.*

números ordinales

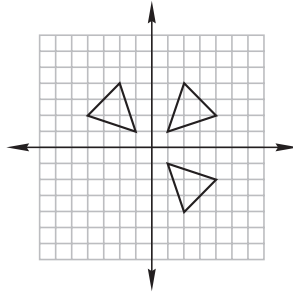
Números que describen posición u orden.

*"Primero", "segundo" y "tercero" son **números ordinales**.*

orientation

(73)

Position of a figure.



The illustration shows the same triangle in three different **orientations**.

orientación

Posición de una figura.

La ilustración muestra el mismo triángulo en tres **orientaciones** diferentes.

ounce

(77)

A unit of weight in the customary system. Also a measure of capacity. See also **fluid ounce**.

Sixteen **ounces** equals a pound. Sixteen **fluid ounces** equals a pint.

onza

Una unidad de peso en el sistema usual. También es una medida de capacidad. Ver también **onza líquida**.

Dieciseis **onzas** es igual a una libra. Dieciseis **onzas líquidas** es igual a una pinta.

outlier

(97)

A number in a list of data that is distant from the other numbers in a list of data.

1, 5, 4, 3, 6, 28, 7, 2

In the data, the number 28 is an **outlier** because it is distant from the other numbers in the list.

valor lejano

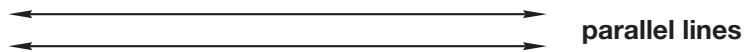
Un número en una lista de datos que es distante de los demás números en la lista.

En los datos el número 28 es un **valor extremo**, porque su valor es mayor que el de los demás números de la lista.

P**parallel lines**

(23)

Lines that stay the same distance apart; lines that do not cross.

**rectas paralelas**

Rectas que permanecen separadas a la misma distancia y que nunca se cruzan.

parallelogram

(92)

A quadrilateral that has two pairs of parallel sides.

**parallelograms**not a **parallelogram****paralelogramo**

Cuadrilátero que tiene dos pares de lados paralelos.

parentheses

(45)

A pair of symbols used to separate parts of an expression so that those parts may be evaluated first: ().

$$15 - (12 - 4)$$

In the expression $15 - (12 - 4)$, the **parentheses** indicate that $12 - 4$ should be calculated before subtracting the result from 15.

paréntesis

Un par de símbolos que se usan para separar partes de una expresión para que esas partes puedan ser evaluadas primero.

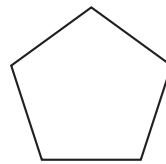
$$15 - (12 - 4)$$

En la expresión $15 - (12 - 4)$ el **paréntesis** indica que $12 - 4$ debe ser calculado antes de restar el resultado de 15.

pentagon

(63)

A polygon with five sides.



pentagon

pentágono

Un polígono con cinco lados.

per

(57)

A term that means “in each.”

*A car traveling 50 miles **per** hour (50 mph) is traveling 50 miles in each hour.*

por cada

Un término que significa “en cada”.

*Un carro viajando 50 millas por hora (50 mph) está viajando 50 millas **por cada** hora.*

percent

(Inv. 5)

A fraction whose denominator of 100 is expressed as a percent sign (%).

$$\frac{99}{100} = 99\% = 99 \text{ percent}$$

porcentaje

Fracción cuyo denominador de 100 se expresa con un signo (%), que se lee por ciento.

perfect square

(Inv. 3)

See **square number**.

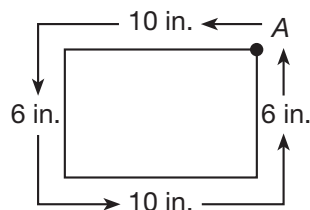
cuadrado perfecto

Ver número al cuadrado.

perimeter

(Inv. 2)

The distance around a closed, flat shape.



*The **perimeter** of this rectangle (from point A around to point A) is 32 inches.*

perímetro

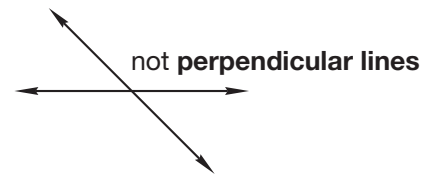
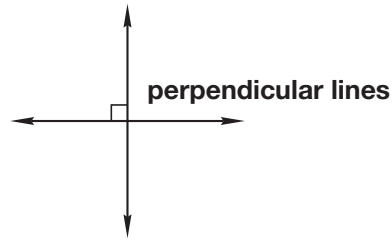
Distancia alrededor de una figura cerrada y plana.

*El **perímetro** de este rectángulo (desde el punto A alrededor del rectángulo hasta el punto A) es 32 pulgadas.*

perpendicular lines

(23)

Two lines that intersect at right angles.

**rectas perpendiculares**

Dos rectas que se intersectan en ángulos rectos.

pictograph

(Inv. 6)

A graph that uses symbols to represent data.

Stars We Saw	
Tom	★ ★ ★ ★ ★
Bob	★ ★
Sue	★ ★ ★ ★
Ming	★ ★ ★ ★ ★
Juan	★ ★ ★ ★ ★ ★

*This is a **pictograph**.
It shows how many
stars each person saw.*

pictograma

Gráfica que utiliza símbolos para representar datos.

Éste es un **pictograma**. Muestra el número de estrellas que vio cada persona.**pie graph**

(Inv. 6)

See **circle graph**.**gráfica circular**Ver **gráfica circular**.**place value**

(4)

The value of a digit based on its position within a number.

$$\begin{array}{r} 341 \\ 23 \\ + 7 \\ \hline 371 \end{array}$$

Place value tells us that 4 in 341 is worth “4 tens.”
In addition problems we align digits with the same
place value.

valor posicional

Valor de un dígito de acuerdo al lugar que ocupa en el número.

$$\begin{array}{r} 341 \\ 23 \\ + 7 \\ \hline 371 \end{array}$$

El **valor posicional** indica que el 4 en 341 vale “cuatro decenas”.
En los problemas de suma y resta, se alinean los dígitos que tienen
el mismo **valor posicional**.

p.m.

(19)

The period of time from noon to just before midnight.

*I go to bed at 9 **p.m.**, which is 9 o'clock at night.*

p.m.

Período de tiempo desde el mediodía hasta justo la medianoche.

*Me voy a dormir a las 9 **p.m.** lo cual es las 9 de la noche.*

point

(23)

An exact position.

•A *This dot represents **point A**.*

punto

Una posición exacta.

*Esta marca representa el **punto A**.*

polygon
(63)

A closed, flat shape with straight sides.



polygons



not **polygons**

polígono

Figura cerrada y plana que tiene lados rectos.

population
(Inv. 7)

A group of people about whom information is gathered during a survey.

*A soft drink company wanted to know the favorite beverage of people in Indiana. The **population** they gathered information about was the people of Indiana.*

población

Un grupo de gente de la cual se obtiene información durante una encuesta.

*Una compañía de sodas quería saber cuál es la bebida favorita de la gente en Indiana. La **población** de la cual recolectaron información fue la gente de Indiana.*

positive numbers
(Inv. 1)

Numbers greater than zero.

*0.25 and 157 are **positive numbers**.*

*–40 and 0 are not **positive numbers**.*

números positivos

Números mayores que cero.

*0.25 y 157 son **números positivos**.*

*–40 y 0 no son **números positivos**.*

pound
(77)

A customary measurement of weight.

*One **pound** is 16 ounces.*

libra

Una medida usual de peso.

*Una **libra** es igual a 16 onzas.*

prime number
(55)

A counting number greater than 1 whose only two factors are the number 1 and itself.

*7 is a **prime number**. Its only factors are 1 and 7.*

*10 is not a **prime number**. Its factors are 1, 2, 5, and 10.*

número primo

Número natural mayor que 1, cuyos dos únicos factores son el 1 y el propio número.

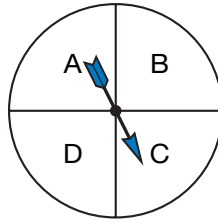
*7 es un **número primo**. Sus únicos factores son 1 y 7.*

*10 no es un **número primo**. Sus factores son 1, 2, 5 y 10.*

probability

(Inv. 10)

A way of describing the likelihood of an event; the ratio of favorable outcomes to all possible outcomes.



The **probability** of the spinner landing on C is $\frac{1}{4}$.

probabilidad

Manera de describir la ocurrencia de un suceso; la razón de resultados favorables a todos los resultados posibles.

La **probabilidad** de obtener 3 al lanzar un cubo estándar de números es $\frac{1}{6}$.

product

(28)

The result of multiplication.

$5 \times 3 = 15$ The **product** of 5 and 3 is 15.

producto

Resultado de una multiplicación.

$5 \times 3 = 15$ El **producto** de 5 por 3 es 15.

proper fraction

(89)

A fraction whose denominator is greater than its numerator.

$\frac{3}{4}$ is a **proper fraction**.

$\frac{4}{3}$ is not a **proper fraction**.

fracción propia

Una fracción cuyo denominador es mayor que el numerador.

$\frac{3}{4}$ es una **fracción propia**.

$\frac{4}{3}$ no es una **fracción propia**.

Property of Zero for Multiplication

(28)

Zero times any number is zero. In symbolic form, $0 \times a = 0$.

The **Property of Zero for Multiplication** tells us that $89 \times 0 = 0$.

propiedad del cero en la multiplicación

Cero multiplicado por cualquier número es cero. En forma simbólica, $0 \times a = 0$.

La **propiedad del cero en la multiplicación** dice que $89 \times 0 = 0$.

pyramid

(98)

A three-dimensional solid with a polygon as its base and triangular faces that meet at a vertex.

**pyramid****pirámide**

Figura geométrica de tres dimensiones, con un polígono en su base y caras triangulares que se encuentran en un vértice.

Q

quadrilateral
(63)

Any four-sided polygon.



*Each of these polygons has 4 sides. They are all **quadrilaterals**.*

cuadrilátero

Cualquier polígono de cuatro lados.

*Cada uno de estos polígonos tiene 4 lados. Todos son **cuadriláteros**.*

quarter
(22)

A term that means one-fourth.

cuarto

Un término que significa un cuarto.

quarter turn
(75)

A turn measuring 90°.

cuarto de giro

Un giro que mide 90°.

quotient
(65)

The result of division.

$$12 \div 3 = 4 \quad 3 \overline{)12} \quad \frac{12}{3} = 4$$

*The **quotient** is 4 in each of these problems.*

cociente

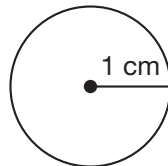
Resultado de una división.

*El **cociente** es 4 en cada una de estas operaciones.*

R

radius
(21)

(Plural: *radii*) The distance from the center of a circle to a point on the circle.



*The **radius** of this circle is 1 centimeter.*

radio

Distancia desde el centro de un círculo hasta un punto del círculo.

*El **radio** de este círculo mide 1 centímetro.*

range
(97)

The difference between the largest number and smallest number in a list.

5, 17, 12, 34, 28, 13

*To calculate the **range** of this list, we subtract the smallest number from the largest number. The **range** of this list is 29.*

intervalo

Diferencia entre el número mayor y el número menor de una lista.

5, 17, 12, 34, 28, 13

*Para calcular el **intervalo** de esta lista, se resta el número menor del número mayor. El **intervalo** de esta lista es 29.*

rate
(57)

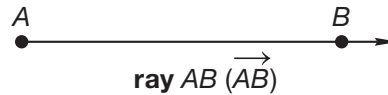
A measure of how far or how many are in one time group.

*The leaky faucet wasted water at the **rate** of 1 liter per day.***tasa**

Una medida de cuánto hay en un grupo por unidad de tiempo.

*La llave de agua con fuga desperdiciaba agua a una **tasa** de 1 litro al día.***ray**
(23)

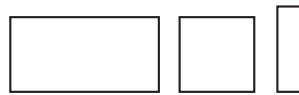
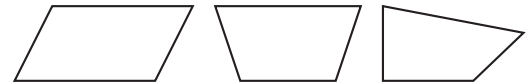
A part of a line that begins at a point and continues without end in one direction.

**rayo**

Parte de una recta que empieza en un punto y continúa indefinidamente en una dirección.

rectangle
(92)

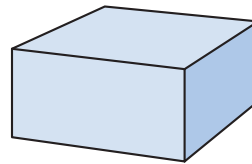
A quadrilateral that has four right angles.

**rectangles****not rectangles****rectángulo**

Cuadrilátero que tiene cuatro ángulos rectos.

rectangular prism
(98)

A geometric solid with 6 rectangular faces.

**rectangular prism****prisma rectangular**

Un sólido geométrico con 6 caras rectangulares.

reduce
(Inv. 9)

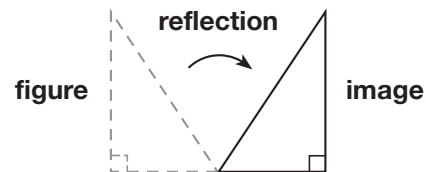
To rewrite a fraction in lowest terms.

*If we **reduce** the fraction $\frac{9}{12}$, we get $\frac{3}{4}$.***reducir**

Escribir una fracción a su mínima expresión.

*Si reducimos $\frac{9}{12}$, obtenemos $\frac{3}{4}$.***reflection**
(73)

Flipping a figure to produce a mirror image.

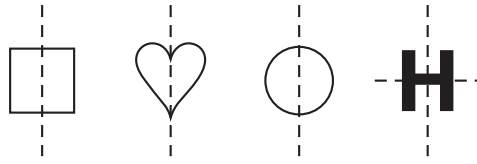
**reflexión**

Voltear una figura para obtener una imagen como si fuera reflejada en un espejo.

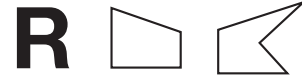
reflective symmetry

(79)

A figure has reflective symmetry if it can be divided into two halves that are mirror images of each other. See *also* **line of symmetry**.



These figures have **reflective symmetry**.



These figures do not have **reflective symmetry**.

simetría de reflexión

Una figura tiene simetría de reflexión si puede ser dividida en dos mitades una de las cuales es la imagen espejo de la otra. Ver también **línea de simetría**.

regrouping

(15)

To rearrange quantities in place values of numbers during calculations.

$$\begin{array}{r} 214 \\ - 39 \\ \hline \end{array} \longrightarrow \begin{array}{r} \overset{1}{2} \overset{10}{1} \overset{14}{4} \\ - 39 \\ \hline 175 \end{array}$$

*Subtraction of 39 from 214 requires **regrouping**.*

reagrupar

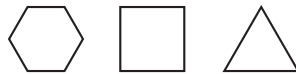
Reordenar cantidades según los valores poscionales de números al hacer cálculos.

*La resta de 39 de 214 requiere **reagrupación**.*

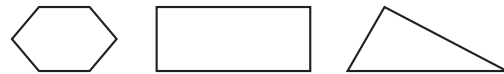
regular polygon

(63)

A polygon in which all sides have equal lengths and all angles have equal measures.



regular polygons



not regular polygons

polígono regular

Polígono en el cual todos los lados tienen la misma longitud y todos los ángulos tienen la misma medida.

remainder

(53)

An amount that is left after division.

$$\begin{array}{r} 7 R 1 \\ 2 \overline{) 15} \\ \underline{14} \\ 1 \end{array}$$

*When 15 is divided by 2, there is a **remainder** of 1.*

residuo

Cantidad que queda después de dividir.

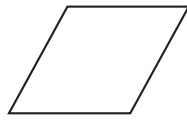
$$\begin{array}{r} 7 R 1 \\ 2 \overline{) 15} \\ \underline{14} \\ 1 \end{array}$$

*Cuando se divide 15 entre 2, queda **residuo** 1.*

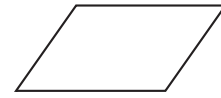
rhombus

(92)

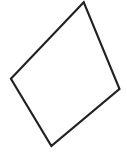
A parallelogram with all four sides of equal length.



rhombuses



not rhombuses

**rombo**

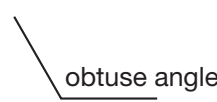
Paralelogramo con sus cuatro lados de igual longitud.

right angle

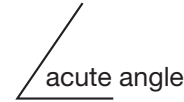
(23)

An angle that forms a square corner and measures 90° . It is often marked with a small square.

right angle



obtuse angle



acute angle

not right angles

A **right angle** is larger than an acute angle and smaller than an obtuse angle.

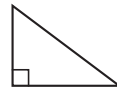
ángulo recto

Ángulo que forma una esquina cuadrada y mide 90° . Se indica con frecuencia con un pequeño cuadrado.

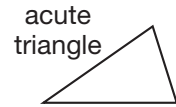
Un **ángulo recto** es mayor que un ángulo agudo y más pequeño que un ángulo obtuso.

right triangle

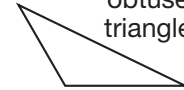
(78)

A triangle whose largest angle measures 90° .

right triangle



acute triangle



obtuse triangle

not right triangles

triángulo rectánguloTriángulo cuyo ángulo mayor mide 90° .**Roman numerals**

(Appendix A)

Symbols used by the ancient Romans to write numbers.

The **Roman numeral** for 3 is *III*.

The **Roman numeral** for 13 is *XIII*.

números romanos

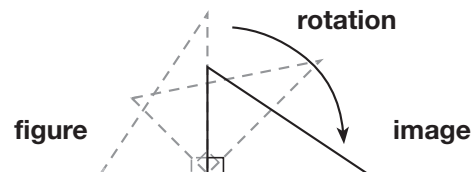
Símbolos usados por los antiguos romanos para escribir números.

El **número romano** para el 3 es *III*.

El **número romano** para el 13 es *XIII*.

rotation

(73)

Turning a figure about a specified point called the *center of rotation*.**rotación**

Giro de una figura alrededor de un punto específico llamado centro de rotación.

rotational symmetry

(79)

A figure has rotational symmetry if it can be rotated less than a full turn and appear in its original orientation.



These figures have **rotational symmetry**.

These figures do not have **rotational symmetry**.

simetría de rotación

Una figura tiene simetría de rotación si puede ser rotada menos que un giro completo y aparecer en su orientación original.

round

(20)

To express a calculation or measure to a specific degree of accuracy.

*To the nearest hundred dollars, \$294 **rounds** to \$300.*

redondear

Expresar un cálculo o medida hasta cierto grado de precisión.

*A la centena de dólares más cercana, \$294 se **redondea** a \$300.*

S

sales tax

(83)

The tax charged on the sale of an item and based upon the item's purchase price.

*If the **sales-tax** rate is 8%, the **sales tax** on a \$5.00 item will be $\$5.00 \times 8\% = \0.40 .*

impuesto sobre la venta

Impuesto que se carga al vender un objeto y que se calcula como un porcentaje del precio del objeto.

*Si la tasa de impuesto es 8%, el **impuesto sobre la venta** de un objeto que cuesta \$5.00 es: $\$5.00 \times 8\% = \0.40 .*

sample

(Inv. 7)

A part of a population used to conduct a survey.

*Mya wanted to know the favorite television show of the fourth-grade students at her school. She asked only the students in Room 3 her survey question. In her survey, the population was the fourth-grade students at the school, and the **sample** was the students in Room 3.*

muestra

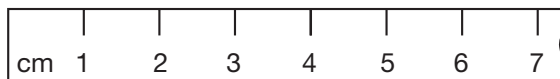
Una parte de una población que se usa para realizar una encuesta.

*Mya quería saber cuál es el programa favorito de los estudiantes de cuarto grado de su escuela. Ella hizo la pregunta de su encuesta a sólo el Salón 3. En su encuesta, la población era los estudiantes del cuarto grado de su escuela, y su **muestra** fue los estudiantes del Salón 3.*

scale

(18)

A type of number line used for measuring.



*The distance between each mark on this ruler's **scale** is 1 centimeter.*

escala

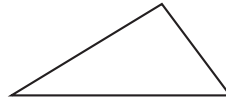
Un tipo de recta numérica que se usa para medir.

*La distancia entre cada marca en la **escala** de esta regla es 1 centímetro.*

scalene triangle

(78)

A triangle with three sides of different lengths.



*All three sides of this **scalene triangle** have different lengths.*

triángulo escaleno

Triángulo con todos sus lados de diferente longitud.

*Los tres lados de este **triángulo escaleno** tienen diferente longitud.*

schedule

(101)

A list of events organized by the times at which they are planned to occur.

Sarah's Class Schedule

Time	Class
8:15 a.m.	Homeroom
9:00 a.m.	Science
10:15 a.m.	Reading
11:30 a.m.	Lunch and recess
12:15 p.m.	Math
1:30 p.m.	English
2:45 p.m.	Art and music
3:30 p.m.	End of school

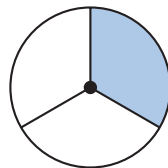
calendario, horario

Una lista de sucesos organizados según la hora cuando están planeados.

sector

(Inv. 10)

A region bordered by part of a circle and two radii.



*This circle is divided into 3 **sectors**. One **sector** of the circle is shaded.*

sector

Región de un círculo limitada por un arco y dos radios.

*Este círculo está dividido en 3 **sectores**. Un **sector** del círculo está sombreado.*

segment

(Inv. 1)

See line segment.

segmento

Ver segmento de recta.

sequence

(3)

A list of numbers arranged according to a certain rule.

*The numbers 5, 10, 15, 20, ... form a **sequence**. The rule is "count up by fives."*

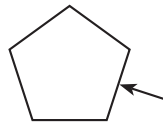
secuencia

Lista de números ordenados de acuerdo a una regla.

*Los números 5, 10, 15, 20, ... forman una **secuencia**. La regla es "contar hacia adelante de cinco en cinco".*

side
(63)

A line segment that is part of a polygon.



*The arrow is pointing to one side.
This pentagon has 5 **sides**.*

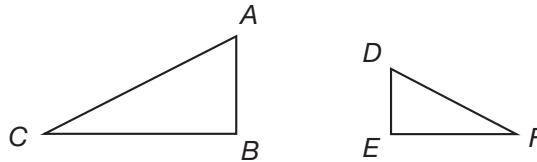
lado

Segmento de recta que forma parte de un polígono.

*La flecha apunta hacia un lado. Este pentágono tiene 5 **lados**.*

similar
(66)

Having the same shape but not necessarily the same size.
Dimensions of similar figures are proportional.



*$\triangle ABC$ and $\triangle DEF$ are **similar**. They have the same shape,
but not the same size.*

semejante

Que tiene la misma forma, pero no necesariamente el mismo tamaño. Las dimensiones de figuras semejantes son proporcionales.

*$\triangle ABC$ y $\triangle DEF$ son **semejantes**. Tienen la misma forma, pero diferente tamaño.*

solid
(98)

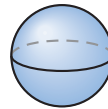
See **geometric solid**.

sólido

Ver **sólido geométrico**.

sphere
(98)

A round geometric solid having every point on its surface at an equal distance from its center.



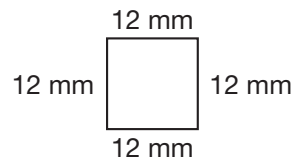
sphere

esfera

Un sólido geométrico redondo que tiene cada punto de su superficie a la misma distancia de su centro.

square
(92, Inv. 3)

1. A rectangle with all four sides of equal length.



*All four sides of this **square**
are 12 millimeters long.*

2. The product of a number and itself.

*The **square** of 4 is 16.*

cuadrado

1. Un rectángulo con sus cuatro lados de igual longitud.

*Los cuatro lados de este **cuadrado** miden 12 milímetros.*

2. El producto de un número por sí mismo.

*El **cuadrado** de 4 es 16.*

square centimeter
(Inv. 3)

A measure of area equal to that of a square with sides of 1 centimeter long.

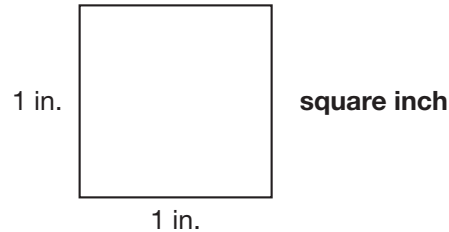


centímetro cuadrado

Medida de un área igual a la de un cuadrado con lados de 1 centímetro.

square inch
(Inv. 3)

A measure of area equal to that of a square with 1-inch sides.



pulgada cuadrada

Medida de un área igual a la de un cuadrado con lados de 1 pulgada.

square number
(Inv. 3)

The product when a whole number is multiplied by itself.

*The number 9 is a **square number** because $9 = 3^2$.*

número al cuadrado

El producto de un número entero multiplicado por sí mismo.

*El número 9 es un **número al cuadrado** porque $9 = 3^2$.*

square root
(Inv. 3)

One of two equal factors of a number. The symbol for the principal, or positive, **square root** of a number is $\sqrt{\quad}$.

*A **square root** of 49 is 7 because $7 \times 7 = 49$.*

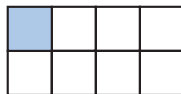
raíz cuadrada

Uno de dos factores iguales de un número. El símbolo de la raíz cuadrada de un número es $\sqrt{\quad}$, y se le llama *radical*.

*La **raíz cuadrada** de 49 es 7, porque $7 \times 7 = 49$.*

square unit
(Inv. 3)

An area equal to the area of a square with sides of designated length.



*The shaded part is 1 **square unit**. The area of the large rectangle is 8 **square units**.*

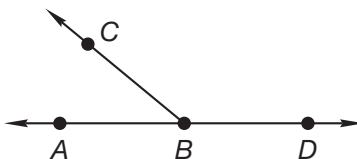
unidad cuadrada

Un área igual al área de un cuadrado con lados de una longitud designada.

*La parte sombreada es 1 **unidad cuadrada**. El área del rectángulo grande es de 8 **unidades cuadradas**.*

straight angle
(81)

An angle that measures 180° and thus forms a straight line.



*Angle ABD is a **straight angle**. Angles ABC and CBD are not **straight angles**.*

ángulo llano

Ángulo que mide 180° y cuyos lados forman una línea recta.

*El ángulo ABD es un **ángulo llano**. Los ángulos ABC y CBD no son **ángulos llanos**.*

subtraction

(6)

The arithmetic operation that reduces a number by an amount determined by another number

$$15 - 12 = 3 \quad \text{We use **subtraction** to take 12 away from 15.}$$

resta

La operación aritmética que reduce un número por cierta cantidad determinada por otro número.

$$15 - 12 = 3 \quad \text{Utilizamos la **resta** para quitar 12 de 15.}$$

sum

(1)

The result of addition.

$$2 + 3 = 5 \quad \text{The **sum** of 2 and 3 is 5.}$$

suma

Resultado de una suma.

$$2 + 3 = 5 \quad \text{La **suma** de 2 más 3 es 5.}$$

survey

(Inv. 7)

A method of collecting data about a particular population.

*Mia conducted a **survey** by asking each of her classmates the name of his or her favorite television show.*

encuesta

Método de reunir información acerca de una población en particular.

*Mia hizo una **encuesta** entre sus compañeros para averiguar cuál era su programa favorito de televisión.*

symmetry

(79)

Correspondence in size and shape on either side of a dividing line. This type of symmetry is known as *reflective symmetry*. See also **line of symmetry**.



These figures have **reflective symmetry**.

These figures do not have **reflective symmetry**.

simetría

Correspondencia en tamaño y forma a cada lado de una línea divisoria. Este tipo de simetría es conocida como *simetría de reflexión*. Ver también **línea de simetría**.

T**table**

(101)

A way of organizing data in columns and rows.

Our Group Scores

Name	Grade
Group 1	98
Group 2	72
Group 3	85
Group 4	96

*This **table** shows the scores of four groups.*

tabla

Una manera de organizar datos en columnas y filas.

*Esta **tabla** muestra las calificaciones de cuatro grupos.*

tally mark
(Inv. 7)

A small mark used to help keep track of a count.



*I used **tally marks** to count cars.
I counted five cars.*

marca de conteo

Una pequeña marca que se usa para llevar la cuenta.

*Usé **marcas de conteo** para contar carros. Yo conté cinco carros.*

tenth
(Inv. 4)

One out of ten parts, or $\frac{1}{10}$.

*The decimal form of one **tenth** is 0.1.*

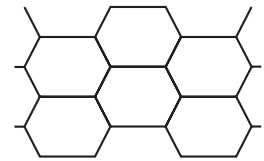
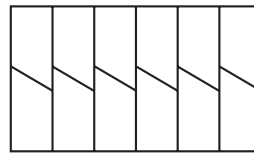
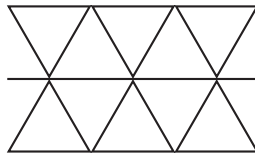
décimo(a)

Una de diez partes ó $\frac{1}{10}$.

*La forma decimal de un **décimo** es 0.1.*

tessellation
(82)

The repeated use of shapes to fill a flat surface without gaps or overlaps.



tessellations

mosaico

El uso repetido de figuras para llenar una superficie plana sin crear huecos o traslapes.

thousandth
(84)

One out of 1000 parts.

*One **thousandth** in decimal form is 0.001.*

milésimo(a)

Una de mil partes.

*Una **milésima** en forma decimal es 0.001.*

tick mark
(Inv. 1)

A mark dividing a number line into smaller portions.

marca de un punto

Una marca que divide a una recta numérica en partes más pequeñas.

ton
(77)

A customary measurement of weight.

tonelada

Una medida usual de peso.

transformation
(73)

Changing a figure's position through rotation, reflection, or translation.

Transformations

Movement	Name
Flip	Reflection
Slide	Translation
Turn	Rotation

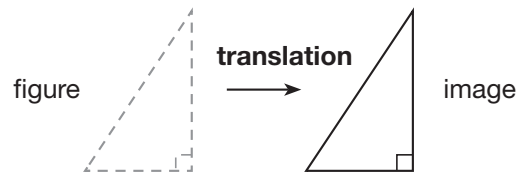
transformación

Cambio en la posición de una figura por medio de una rotación, reflexión o traslación.

translation

(73)

Sliding a figure from one position to another without turning or flipping the figure.

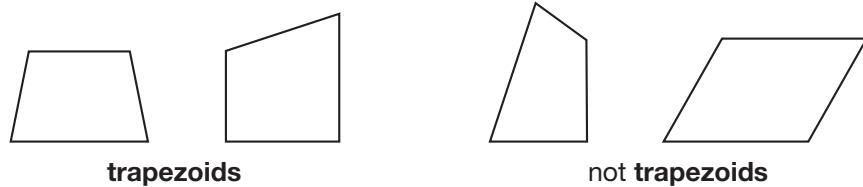
**traslación**

Deslizamiento de una figura de una posición a otra, sin rotar ni voltear la figura.

trapezoid

(92)

A quadrilateral with exactly one pair of parallel sides.

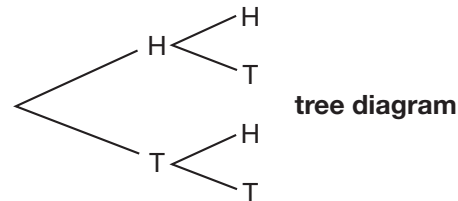
**trapecio**

Cuadrilátero que tiene exactamente un par de lados paralelos.

tree diagram

(82)

A way to use branches to organize the choices of a combination problem.

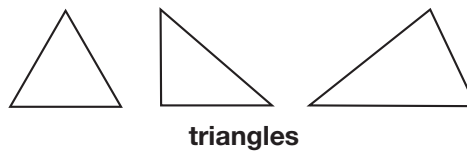
**diagrama de árbol**

Una manera de usar ramas para organizar los opciones de un problema de comparación.

triangle

(63)

A polygon with three sides and three angles.

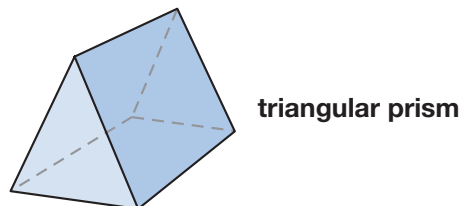
**triángulo**

Un polígono con tres lados y tres ángulos.

triangular prism

(82)

A geometric solid with 3 rectangular faces and 2 triangular bases.

**prisma triangular**

Un sólido geométrico con 3 caras rectangulares y 2 bases triangulares.

U

unit
(Inv. 2)

Any standard object or quantity used for measurement.
*Grams, pounds, liters, gallons, inches, and meters are all **units**.*

unidad

Cualquier objeto o cantidad estándar que se usa para medir.
*Gramos, libras, galones, pulgadas y metros son **unidades**.*

U.S. Customary System
(Inv. 2)

A system of measurement used almost exclusively in the United States.

*Pounds, quarts, and feet are units in the **U.S. Customary System**.*

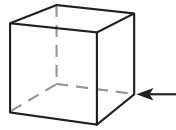
Sistema usual de EE.UU.

Unidades de medida que se usan exclusivamente en EE.UU.
*Libras, cuartos y pies son unidades del **Sistema usual de EE.UU.***

V

vertex
(23)

(Plural: *vertices*) A point of an angle, polygon, or solid where two or more lines, rays, or segments meet.



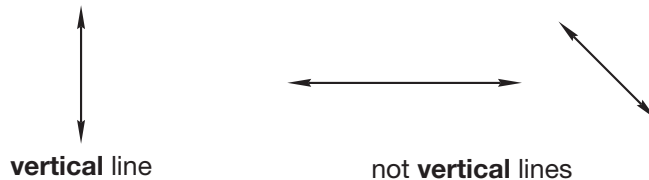
*The arrow is pointing to one **vertex** of this cube. A cube has eight **vertices**.*

vértice

Punto de un ángulo, polígono o sólido, donde se unen dos o más rectas, semirrectas o segmentos de recta.
*La flecha apunta hacia un **vértice** de este cubo. Un cubo tiene ocho **vértices**.*

vertical
(23)

Upright; perpendicular to horizontal.

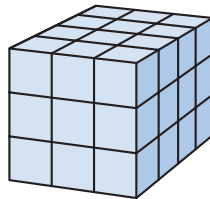


vertical

Hacia arriba; perpendicular a la horizontal.

volume
(Inv. 11)

The amount of space a solid shape occupies. Volume is measured in cubic units.



*This rectangular prism is 3 units wide, 3 units high, and 4 units deep. Its **volume** is $3 \cdot 3 \cdot 4 = 36$ cubic units.*

volumen

La cantidad de espacio ocupado por una figura sólida. El volumen se mide en unidades cúbicas.
*Este prisma rectangular tiene 3 unidades de ancho, 3 unidades de altura y 4 unidades de profundidad. Su **volumen** es $3 \cdot 3 \cdot 4 = 36$ unidades cúbicas.*

W

weight

(77)

The measure of the force of gravity on an object. Units of weight in the customary system include ounces, pounds, and tons.

*The **weight** of a bowling ball would be less on the moon than on Earth because the force of gravity is weaker on the moon.*

peso

La medida de la fuerza de gravedad sobre un objeto. Las unidades de peso en el sistema usual incluyen onzas, libras y toneladas.

*El **peso** de una bola de boliche es menor en la Luna que en la Tierra porque la fuerza de gravedad es menor en la Luna.*

whole numbers

(7)

All the numbers in this sequence: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

*The number 35 is a **whole number**, but $35\frac{1}{2}$ and 3.2 are not.*

***Whole numbers** are the counting numbers and zero.*

números enteros

Todos los números en esta secuencia: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

*El número 35 es un **número entero** pero $35\frac{1}{2}$ y 3.2 no lo son.*

*Los **números enteros** son los números de conteo y el cero.*

Y

yard

(Inv. 2)

A customary measurement of length.

yarda

Una medida usual de longitud.

Symbols

Symbol	Meaning	Example
\triangle	Triangle	$\triangle ABC$
\angle	Angle	$\angle ABC$
\rightarrow	Ray	\overrightarrow{AB}
\leftrightarrow	Line	\overleftrightarrow{AB}
$\overline{\quad}$	Line segment	\overline{AB}
\perp	Perpendicular to	$AB \perp BC$
\parallel	Parallel to	$AB \parallel BC$
$<$	Less than	$2 < 3$
$>$	Greater than	$3 > 2$
$=$	Equal to	$2 = 2$
$^{\circ}\text{F}$	Degrees Fahrenheit	100°F
$^{\circ}\text{C}$	Degrees Celsius	32°C
L	Right angle (90° angle)	\square
\dots	And so on	$1, 2, 3, \dots$
\times	Multiply	9×3
\cdot	Multiply	$3 \cdot 3 = 9$
\div	Divide	$9 \div 3$
$+$	Add	$9 + 3$
$-$	Subtract	$9 - 3$
$\overline{\quad}$	Divided into	$3 \overline{)9}$
R or r	Remainder	$3 \text{ R } 2$
$\%$	Percent	50%
x^2	"x" squared (times itself)	$3^2 = 3 \times 3 = 9$
x^3	"x" cubed	$3^3 = 3 \times 3 \times 3 = 27$
$\sqrt{\quad}$	Square root	$\sqrt{9} = 3$ because $3 \times 3 = 9$.

Abbreviations

Abbreviation	Meaning
ft	Foot
in.	Inch
yd	Yard
mi	Mile
m	Meter
cm	Centimeter
mm	Millimeter
km	Kilometer
L	Liter
ml or mL	Milliliter
lb	Pound
oz	Ounce
kg	Kilogram
g	Gram
mg	Milligram
qt	Quart
pt	Pint
c	Cup
gal	Gallon

Formulas

Purpose	Formula
Perimeter of a rectangle	$P = 2l + 2w$
Area of a square	$A = 4s$
Area of a rectangle	$A = l \cdot w$
Volume of a cube	$V = s^3$
Volume of a rectangular prism	$V = l \cdot w \cdot h$

Símbolos/Signos

Símbolo/Signo	Significa	Ejemplo
\triangle	Triángulo	$\triangle ABC$
\sphericalangle	Ángulo	$\sphericalangle ABC$
\rightarrow	Rayo	\overrightarrow{AB}
\leftrightarrow	Recta	\overleftrightarrow{AB}
$\overline{\quad}$	Segmento de recta	\overline{AB}
\perp	Perpendicular a	$AB \perp BC$
\parallel	Paralelo a	$AB \parallel BC$
$<$	Menor que	$2 < 3$
$>$	Mayor que	$3 > 2$
$=$	Igual a	$2 = 2$
$^{\circ}\text{F}$	Grados Fahrenheit	100°F
$^{\circ}\text{C}$	Grados Celsius	32°C
L	Ángulo recto (ángulo de 90°)	\square
\dots	Y más, etcétera	$1, 2, 3, \dots$
\times	Multiplica	9×3
\cdot	Multiplica	$3 \cdot 3 = 9$
\div	Divide	$9 \div 3$
$+$	Suma	$9 + 3$
$-$	Resta	$9 - 3$
$\overline{\quad}$	Dividido entre	$3 \overline{)9}$
R or r	Residuo	$3 \text{ R } 2$
$\%$	Por ciento, porcentaje	50%
x^2	"x" al cuadrado (por sí mismo)	$3^2 = 3 \times 3 = 9$
x^3	"x" al cubo	$3^3 = 3 \times 3 \times 3 = 27$
$\sqrt{\quad}$	Raíz cuadrada	$\sqrt{9} = 3$ por que $3 \times 3 = 9$.

Abreviaturas

Abreviatura	Significa
pie	pie
pulg	pulgada
yd	yarda
mi	milla
m	metro
cm	centímetro
mm	milímetro
km	kilómetro
L	litro
mL	mililitro
lb	libra
oz	onza
kg	kilogramo
g	gramo
mg	miligramo
ct	cuarto
pt	pinta
tz	taza
gal	galón

Fórmulas

Propósito	Fórmula
Perímetro	$P = 2L + 2a$
Área de un cuadrado	$A = 4l$
Área de un rectángulo	$A = L \cdot a$
Volumen de un cubo	$V = l^3$
Volumen de un prisma rectangular	$V = L \cdot a \cdot h$

¢ (cent sign), 220. *See also* **Money**

— (division bar), 123–125. *See also* **Division**

÷ (division sign), 302. *See also* **Division**

\$ (dollar sign), 220. *See also* **Money**

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• (multiplication dot), 396. *See also* **Multiplication**

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