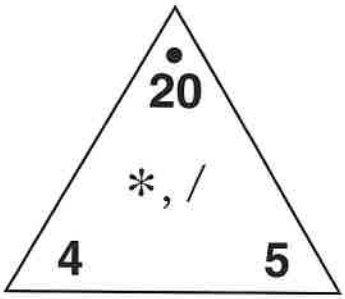
Name Date Time

STUDY LINK 2·10

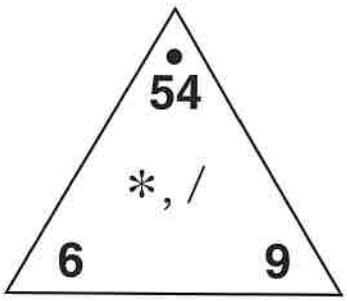
# Unit 3: Family Letter

## Multiplication and Division; Number Sentences and Algebra




One of our goals in the coming weeks is to finish memorizing the multiplication facts for single-digit numbers. To help students master the facts, they will play several math games. Ask your child to teach you one of the games described in the *Student Reference Book,* and play a few rounds together.

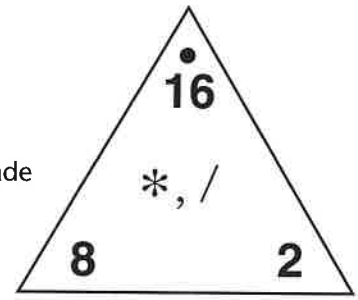
The class will also take a series of 50-facts tests for multiplication. Because correct answers are counted only up to the first mistake (and not counted thereafter), your child may at first receive a low score. If this happens, don't be alarmed. Before long, scores will improve dramatically. Help your child set a realistic goal for the next test, and discuss what can be done to meet that goal.




Your child will use Multiplication/Division Fact Triangles to review the relationship between multiplication and division. (For example, $4 \times 5 = 20$, so $20 \div 5 = 4$ and $20 \div 4 = 5$.) You can use the triangles to quiz your child on the basic facts and test your child's progress.

In this unit, alternative symbols for multiplication and division are introduced. An asterisk (*) may be substituted for the traditional $\times$ symbol, as in $4 * 5 = 20$. A slash (/) may be used in place of the traditional $\div$ symbol, as in $20/4 = 5$.

In Unit 3, the class will continue the World Tour, a yearlong project in which the students travel to a number of different countries. Their first flight will take them to Cairo, Egypt. These travels serve as background for many interesting activities in which students look up numerical information, analyze this information, and solve problems.




Finally, the class will have its first formal introduction to solving equations in algebra. (Informal activities with missing numbers in number stories have been built into the program since first grade.) Formal introduction to algebra in fourth grade may surprise you, because algebra is usually regarded as a high school subject. However, an early start in algebra is integral to the *Everyday Mathematics* philosophy.

**Please keep this Family Letter for reference as your child works through Unit 3.**

# Vocabulary

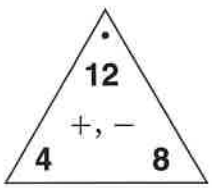
Important terms in Unit 3:

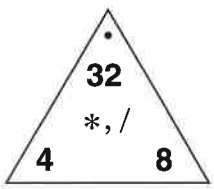
**dividend** In division, the number that is being divided. For example, in $35 \div 5 = 7$, the dividend is 35.

**divisor** In division, the number that divides another number. For example, in $35 \div 5 = 7$, the divisor is 5.

**Fact family** A set of related arithmetic facts linking two inverse operations. For example, $4 + 8 = 12$, $8 + 4 = 12$, $12 - 4 = 8$, and $12 - 8 = 4$ is an addition/subtraction fact family, and $4 * 8 = 32$, $8 * 4 = 32$, $32/4 = 8$, and $32/8 = 4$ is a multiplication/division fact family.

**Fact Triangle** A triangular flash card labeled with the numbers of a *fact family* that students can use to practice addition/subtraction or multiplication/division facts.




**factor** One of two or more numbers that are multiplied to give a product. For example, $4 * 1.5 = 6$; so 6 is the product, and 4 and 1.5 are the factors. See also *factor of a counting number* n.

**factor of a counting number *n*** A counting number whose product with some other counting number equals *n*. For example, 2 and 3 are factors of 6 because $2 * 3 = 6$. But 4 is not a factor of 6 because $4 * 1.5 = 6$ and 1.5 is not a counting number.

**multiple of a number *n*** A product of *n* and a counting number. The multiples of 7, for example, are 7, 14, 21, 28, and so on.

**number sentence** Two numbers or expressions separated by a relation symbol ($=$, $>$, $<$, $\geq$, $\leq$, or $\neq$). Most number sentences also contain at least one operation symbol ($+$, $-$, $\times$, $*$, $\cdot$, $\div$, /). Number sentences may also have grouping symbols, such as parentheses.

**open sentence** A *number sentence* in which one or more *variables* hold the places of missing numbers. For example, $5 + x = 13$ is an open sentence.

**percent (%)** Per hundred, or out of a hundred. For example, "48% of the students in the school are boys" means that, on average, 48 out of every 100 students in the school are boys; $48\% = \frac{48}{100} = 0.48$

**product** The result of multiplying two numbers called *factors*. For example, in $4 * 3 = 12$, the product is 12.

**quotient** The result of dividing one number by another number. For example, in $35 \div 5 = 7$, the quotient is 7.

**square number** A number that is the product of a counting number and itself. For example, 25 is a square number because $25 = 5 * 5$. The square numbers are 1, 4, 9, 16, 25, and so on.

**variable** A letter or other symbol that represents a number. A variable can represent one specific number. For example, in the number sentence $5 + n = 9$, only $n$ makes the sentence true. A variable may also stand for many different numbers. For example, $x + 2 < 10$ is true if $x$ is any number less than 8. And in the equation $a + 3 = 3 + a$, $a$ stands for all numbers.

**"What's My Rule?" problem** A type of problem that asks for a rule for relating two sets of numbers. Also, a type of problem that asks for one of the sets of numbers, given a rule and the other set of numbers.

| Rule |
|---|
| ×8 |

| in | out |
|---|---|
| 6 | 48 |
| 10 | 80 |
| 3 | |
| | 56 |
| | 64 |

# As You Help Your Child with Homework

As your child brings assignments home, you may want to go over the instructions together, clarifying them as necessary. The answers listed below will guide you through some of the Study Links in this unit.

### Study Link 3•1

**1.** 60, 230, 110, 280, 370

**2.** 110, 80, 310, 240, 390

**3.** 34, 675, 54; +46 **4.** 9, 50, 420; ×7

**5.** 2, 400, 2,000 **6.** Answers vary.

**7.** 115 **8.** 612 **9.** 1,440

### Study Link 3•2

**2.** 1, 2, 3, 4, 6, 9, 12, 18, 36 **3.** 1, 16; 2, 8; 4, 4

**4.** 56 **5.** Sample answer: 4, 8, 12, 16 **6.** 53

**7.** 388 **8.** 765

### Study Link 3•3

**1.** 24 **2.** 54 **3.** 28 **4.** 16

**5.** 45 **6.** 18 **7.** 40 **8.** 25

**9.** 48 **11.** 1, 2, 3, 6, 9, 18

### Study Link 3•4

**1.** 6 **2.** 8 **3.** 6 **4.** 3

**6.** 20; 5 **7.** 18; 6 **8.** 49; 7 **9.** 9; 2

**10.** 7; 5 **11.** 7; 4

**12.** Sample answer: 10, 15, 20, 25

**13.** 1, 2, 3, 4, 6, 8, 12, 24

### Study Link 3•5

**1.** 5 **2.** 7 **3.** 72 **4.** 10

**5.** 32 **15.** 1,646 **16.** 5,033

**17.** 289 **18.** 1,288

### Study Link 3•6

**3. a.** T

**4.** about 128,921 miles;
132,000 − 3,079 = 128,921

**5. a.** 4

**6.** 1, 2, 3, 4, 6, 12

**7.** Sample answers: 16, 24, 32, 40

### Study Link 3•7

| | Cities | Measurement on Map (inches) | Real Distance (miles) |
|---|---|---|---|
| **1.** | Cape Town and Durban | 4 | 800 |
| **2.** | Durban and Pretoria | $1\frac{3}{4}$ | 350 |
| **3.** | Cape Town and Johannesburg | 4 | 800 |
| **4.** | Johannesburg and Queenstown | 2 | 400 |
| **5.** | East London and Upington | $2\frac{1}{2}$ | 500 |
| **6.** | ____ and ____ | Answers vary. | |

### Study Link 3•8

**1.** 659 − 457 = 202; 202

**2.** 1,545 + 2,489 = 4,034; 4034

**3.** 700 − 227 = 473; 473

**4.** 1,552 − 1,018 = 534; 534

**5.** 624 + 470 + 336 = 1,430; 1,430 **6.** 9

**7.** 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

### Study Link 3•9

**1.** F **2.** F **3.** T **4.** T

**5.** F **6.** T **7.** T **8.** ?

**11. b.** 7 * 8 = 56 **12.** 36, 60, 84; +12

**13.** 54, 216, 324; +54

### Study Link 3•10

**1.** 27 **2.** 33 **3.** 1 **4.** 24

**5.** 37 **6.** 8 **7.** 3 * (6 + 4) = 30

**8.** 15 = (20/4) + 10 **9.** 7 + (7 * 3) = 4 * 7

**10.** 9 * 6 = (20 + 7) * 2

**11.** 72 ÷ 9 = (2 * 3) + (18 ÷ 9)

**12.** 35 ÷ (42 ÷ 6) = (10 − 6) + 1 **13.** ?

**14.** ? **15.** F **16.** T **17.** F **18.** T

Name Date Time

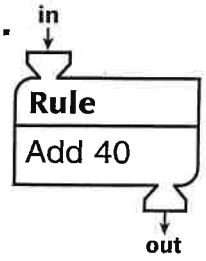
STUDY LINK 3•1

# "What's My Rule?"

SRB 162–166

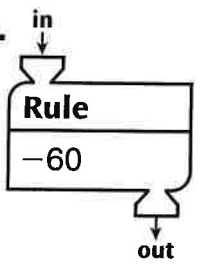
Complete the "What's My Rule?" tables and state the rules.

**1.**




| in | out |
|---|---|
| 20 | |
| 190 | |
| 70 | |
| 240 | |
| 330 | |

**2.**




| in | out |
|---|---|
| | 50 |
| | 20 |
| | 250 |
| | 180 |
| | 330 |

**3.** Rule: _____

| in | out |
|---|---|
| 131 | 177 |
| | 80 |
| 104 | 150 |
| 629 | |
| | 100 |

**4.** Rule: _____

| in | out |
|---|---|
| 70 | 490 |
| | 63 |
| | 350 |
| 20 | 140 |
| 60 | |

## Try This

**5.** Rule: There are 20 nickels in $1.00.

| dollars | nickels |
|---|---|
| 3 | 60 |
| | 40 |
| 5 | 100 |
| 20 | |
| 100 | |

**6.** Create your own.

Rule: _____

| in | out |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

## Practice

**7.** _____ = 47 + 68 **8.** 359 + 253 = _____ **9.** 787 + 653 = _____

Name Date Time

STUDY LINK 3•2

# Multiplication Facts

SRB 16 20

**1.** Complete the Multiplication/Division Facts Table below.

| *,/ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | 6 | | | | |
| 2 | | | | | | | | | | |
| 3 | 3 | | 9 | | | | | | | |
| 4 | | 8 | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | 14 | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |

**2.** List all the *factors* of 36. _____

**3.** List the *factor pairs* of 16. _____ and _____, _____ and _____, _____ and _____

**4.** Name the *product* of 8 and 7. _____

**5.** Name four *multiples* of 4. _____, _____, _____, _____

**Practice**

**6.** _____ = 91 − 38 **7.** _____ = 630 − 242 **8.** 1,462 − 697 = _____

Name Date Time

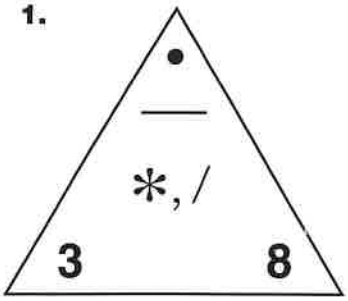
STUDY LINK 3·3

# Fact Triangles

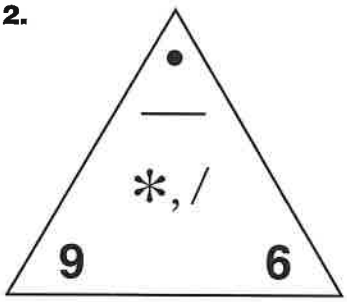
Complete these Multiplication/Division Fact Triangles.

SRB 16

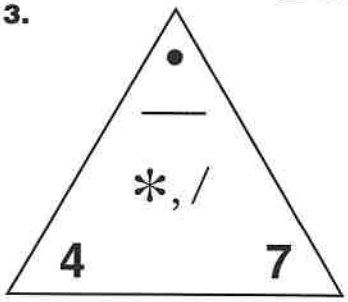
**1.**



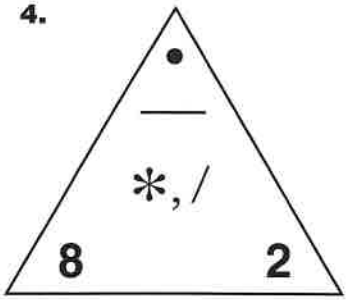

**2.**



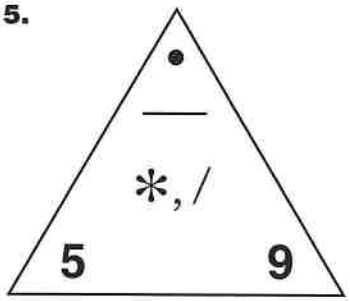

**3.**



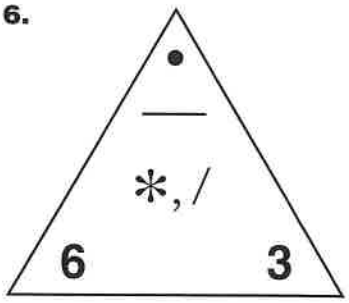

**4.**



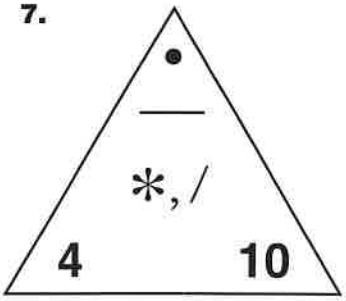

**5.**



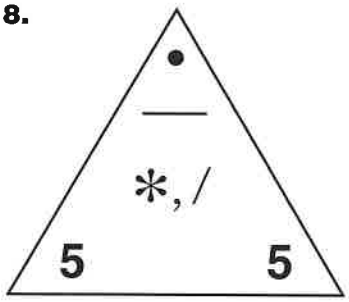

**6.**



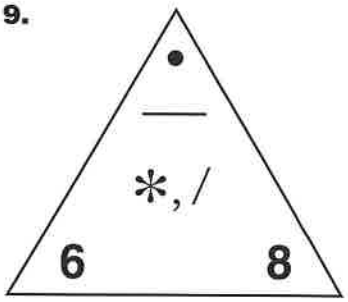

**7.**




**8.**




**9.**




## Practice

**10.** Name 4 multiples of 7. _____, _____, _____, _____

**11.** List all the factors of 18. _____

**12.** Name the product of 9 and 6. _____

**13.** List all the factor pairs of 20.

_____ and _____, _____ and _____, _____ and _____

Name Date Time

STUDY LINK 3•4

# Mystery Numbers

SRB 16

Find the mystery numbers.

1. I am thinking of a mystery number. If I multiply it by 4, the answer is 24. What is the number? _____

2. I am thinking of another number. If I multiply it by 3, the answer is 24. What is the number? _____

3. I multiplied a number by itself and got 36. What is the number? _____

4. If I multiply 7 by a number, I get 21. What is the number? _____

5. Write your own mystery number problem.

_____

_____

Fill in the missing numbers.

6. $4 * 5 =$ _____ _____ $* 4 = 20$

7. _____ $= 6 * 3$ $18 =$ _____ $* 3$

8. $7 * 7 =$ _____ _____ $* 7 = 49$

9. _____ $* 2 = 18$ $18 =$ _____ $* 9$

10. $35 =$ _____ $* 5$ _____ $* 7 = 35$

11. $28 =$ _____ $* 4$ _____ $* 7 = 28$

## Practice

12. Name 4 multiples of 5. _____, _____, _____, _____

13. List all the factors of 24. _____

Name Date Time

STUDY LINK 3•5

# Missing Numbers

Complete each fact by filling in the missing numbers.
Use the Multiplication/Division Facts Table to help you.

SRB 16 20

**1.** 30 / 6 = _____

**2.** 21 / _____ = 3

**3.** 9 = _____ ÷ 8

**4.** 100 / _____ = 10

**5.** _____ / 4 = 8

**6.** 25 ÷ _____ = _____

**7.** _____ = 42 / _____

**8.** 8 / _____ = _____

**9.** 4 = _____ / _____

**10.** _____ ÷ _____ = 1

**11.** _____ / 2 = _____

**12.** 10 * _____ = _____

## Try This

**13.** 5 * _____ * _____ = 30

**14.** 54 = _____ * _____ * _____

| *, / | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **2** | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| **3** | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| **4** | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| **5** | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| **6** | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| **7** | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| **8** | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| **9** | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| **10** | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

## Practice

**15.** _____ = 989 + 657

**16.** 314 + 4,719 = _____

**17.** 887 − 598 = _____

**18.** _____ = 2,004 − 716

Name Date Time

STUDY LINK 3•6

# Number Stories about Egypt

1. The Nile in Africa is about 4,160 miles long. The Huang River in Asia is about 800 miles shorter than the Nile. How long is the Huang River?

   Number model: _____ About _____ miles

2. The Suez Canal links the Mediterranean and Red Seas. It is 103 miles long and was opened in 1869. For how many years has the Suez Canal been open?

   Number model: _____ _____ years

3. Egypt has about 3,079 miles of railroad. The United States has about 132,000 miles of railroad. How many fewer miles of railroad does Egypt have than the United States?

   Number model: _____ About _____ miles

4. The population of Cairo, the capital of Egypt, is about 10,834,000. The population of Washington, D.C., is about 563,000.

   a. True or false? About $10\frac{1}{2}$ million more people live in Cairo than in Washington, D.C. _____

   b. Explain how you solved the problem.

   _____

   _____

## Try This

5. The area of Egypt is about 386,700 square miles. The area of Wyoming is about 97,818 square miles.

   a. Egypt is about how many times as large as Wyoming? _____

   b. Explain how you solved the problem.

   _____

   _____

## Practice

6. List all the factors of 12. _____

7. Name 4 multiples of 8. _____, _____, _____, _____

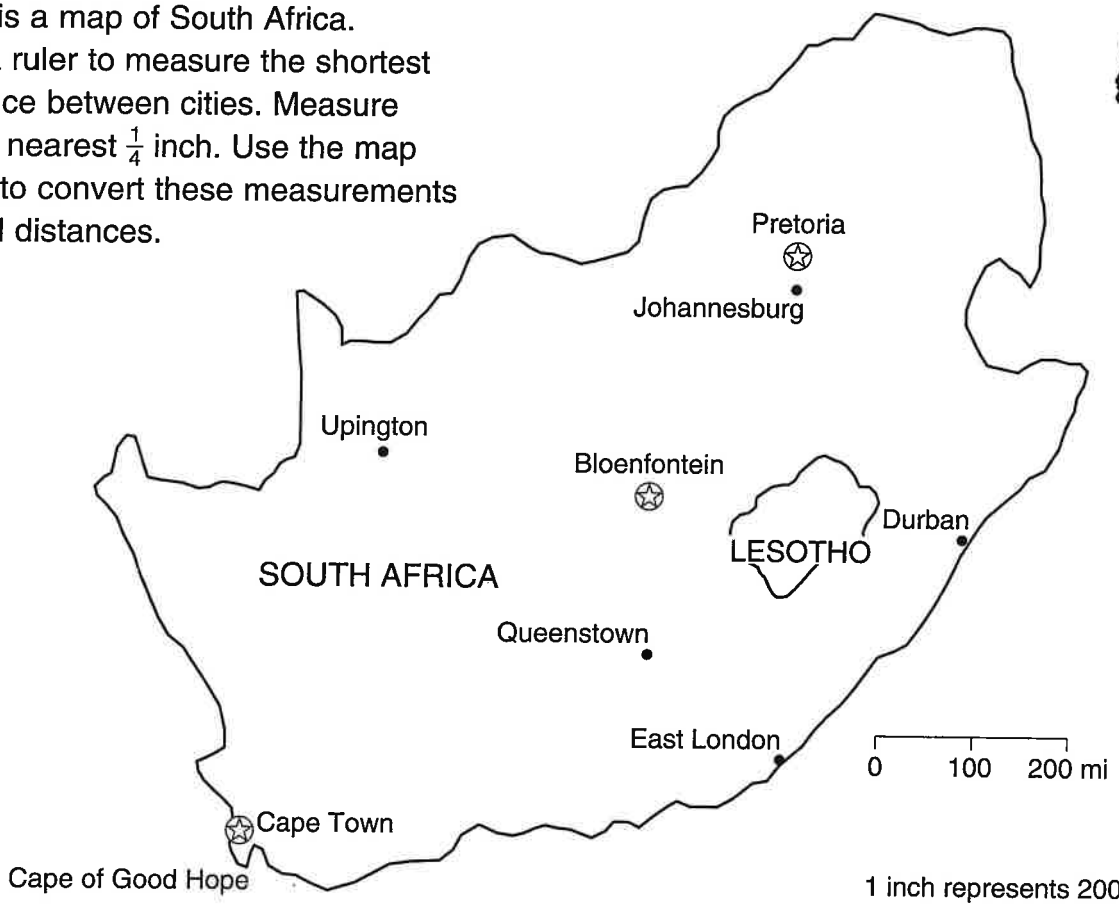
Name Date Time

STUDY LINK 3·7

# Map Scale

SRB 145

Here is a map of South Africa. Use a ruler to measure the shortest distance between cities. Measure to the nearest $\frac{1}{4}$ inch. Use the map scale to convert these measurements to real distances.




1 inch represents 200 miles

| | Cities | Measurement on Map (inches) | Real Distance (miles) |
|---|---|---|---|
| **1.** | Cape Town and Durban | | |
| **2.** | Durban and Pretoria | | |
| **3.** | Cape Town and Johannesburg | | |
| **4.** | Johannesburg and Queenstown | | |
| **5.** | East London and Upington | | |
| **6.** | _____ and _____ | | |

## Practice

**7.** _____ = 767 + 254

**8.** 193 + 6,978 = _____

**9.** 562 − 388 = _____

**10.** _____ = 4,273 − 678

Name Date Time

STUDY LINK 3•8

# Addition and Subtraction Number Stories

SRB 153

**1.** In 1896, the United Kingdom had the largest navy in the world with 659 ships. France had the second-largest navy with 457 ships. The United States was tenth with only 95 ships. How many more ships did the United Kingdom have than France?

_____ **Answer:** _____ more ships
(number model)

**2.** Rhode Island, the smallest state in the United States, has an area of 1,545 square miles. The area of the second-smallest state, Delaware, is 2,489 square miles. What is the combined area of these two states?

_____ **Answer:** _____ square miles
(number model)

**3.** A polar bear can weigh as much as 700 kilograms. An American black bear can weigh as much as 227 kilograms. How much more can a polar bear weigh than an American black bear?

_____ **Answer:** _____ kilograms more
(number model)

**4.** The Pacific leatherback turtle's maximum weight is about 1,552 pounds. The Atlantic leatherback turtle's maximum weight is about 1,018 pounds. What is the difference between the turtles' weights?

_____ **Answer:** _____ pounds
(number model)

**5.** According to the National Register of Historic Places, New York City has the most historic places in the United States with 624 sites. Philadelphia is second with 470 sites, and Washington, D.C., is third with 336 sites. How many historic sites are there in these three cities?

_____ **Answer:** _____ historic sites
(number model)

## Practice

**6.** The numbers 81, 27, and 45 are multiples of _____.

**7.** List the first ten multiples of 6.

_____, _____, _____, _____, _____, _____, _____, _____, _____, _____

Name Date Time

STUDY LINK 3•9

# Number Sentences

SRB 148

Next to each number sentence, write T if it is true, F if it is false, or ? if you can't tell.

**1.** $20 - 12 = 8 * 3$ _____

**2.** $7 = 14 * 2$ _____

**3.** $497 < 500$ _____

**4.** $16 / 4 = 4$ _____

**5.** $15 + 10 = 5$ _____

**6.** $24 > 11 + 11$ _____

**7.** $100 - 5 = 95$ _____

**8.** $33 - 4$ _____

**9.** Write two true number sentences. _____

_____

**10.** Write two false number sentences. _____

_____

**11. a.** Explain why $7 * 8$ is not a number sentence.

_____

_____

**b.** How could you change $7 * 8$ to make a true number sentence?

_____

_____

**c.** How could you change $7 * 8$ to make a false number sentence?

_____

_____

## Practice

**12.** 24, _____, 48, _____, 72, _____ Rule: _____

**13.** _____, 108, 162, _____, 270, _____ Rule: _____

Name Date Time

STUDY LINK 3•10

# Parentheses in Number Sentences


Write the missing number to make each number sentence true.

**1.** (45 / 5) * 3 = _____

**2.** 9 + (4 * 6) = _____

**3.** (20 ÷ 4) ÷ 5 = _____

**4.** _____ = (33 − 25) * 3

**5.** _____ = (25 / 5) + (8 * 4)

**6.** (33 + 7) / (3 + 2) = _____

Insert parentheses ( ) to make each number sentence true.

**7.** 3 * 6 + 4 = 30

**8.** 15 = 20 / 4 + 10

**9.** 7 + 7 * 3 = 4 * 7

**10.** 9 * 6 = 20 + 7 * 2

## Try This

Insert two sets of parentheses to make each number sentence true.

**11.** 72 ÷ 9 = 2 * 3 + 18 ÷ 9

**12.** 35 ÷ 42 ÷ 6 = 10 − 6 + 1

Write T if it is true, F if it is false, or ? if you can't tell.

**13.** (6 * 5) / 3 _____

**14.** (3 * 7) / (15 − 12) _____

**15.** 30 = 1 + (4 * 6) _____

**16.** (4 * 6) + 13 = 47 − 10 _____

**17.** 15 > (7 * 6) * (10 − 9) _____

**18.** 20 < (64 ÷ 8) * (12 ÷ 4) _____

## Practice

**19.** _____ = 494 + 3,769

**20.** 5,853 + 4,268 = _____

**21.** _____ = 8,210 − 654

**22.** 7,235 − 906 = _____

Name Date Time

STUDY LINK 3·11

# Open Sentences


Write T if the number sentence is true and F if the number sentence is false.

**1.** $35 = 7 * 5$ _____

**2.** $43 > 34$ _____

**3.** $25 + 25 < 50$ _____

**4.** $49 - (7 \times 7) = 0$ _____

Make a true number sentence by filling in the missing number.

**5.** _____ $= 12 / (3 + 3)$

**6.** $(60 - 28) / 4 =$ _____

**7.** $(3 \times 8) \div 6 =$ _____

**8.** $30 - (4 + 6) =$ _____

Make a true number sentence by inserting parentheses.

**9.** $4 * 2 + 10 = 18$

**10.** $16 = 16 - 8 * 2$

**11.** $27 / 9 / 3 = 1$

**12.** $27 / 9 / 3 = 9$

Find the solution of each open sentence below. Write a number sentence with the solution in place of the variable. Check to see whether the number sentence is true.

**Example:** $6 + x = 14$ **Solution:** 8 **Number sentence:** $6 + 8 = 14$

| Open sentence | Solution | Number sentence |
|---|---|---|
| **13.** $12 + x = 32$ | _____ | _____ |
| **14.** $s = 200 - 3$ | _____ | _____ |
| **15.** $5 * y = 40$ | _____ | _____ |
| **16.** $7 = x / 4$ | _____ | _____ |

## Practice

**17.** $366 + 7{,}565 =$ _____

**18.** $3{,}238 + 9{,}784 =$ _____

**19.** $9{,}325 - 756 =$ _____

**20.** $4{,}805 - 2{,}927 =$ _____