

Mad Minute Averages

Name _____ Date _____

week of 8-8		week of 8-15		week of 8-22		week of 8-29	
Mon. 16 = 40%	Mon. 14 = 35%	Mon. 11 = 28%	Mon. 12 = 30%				
Tues. 14 = 35%	Tues.	Tues. 13 = 33%	Tues.				
Wed. 13 = 33%	Wed.	Wed. 19 = 48%	Wed.				
Thurs. 18 = 45%	Thurs.	Thurs. 17 = 43%	Thurs.				
Fri. 15 = 38%	Fri.	Fri. 13 = 33%	Fri.				
Mon.	Mon.	Mon.	Mon.				
Tues.	Tues.	Tues.	Tues.				
Wed.	Wed.	Wed.	Wed.				
Thurs.	Thurs.	Thurs.	Thurs.				
Fri.	Fri.	Fri.	Fri.				
Mon.	Tues.	Wed.	Thurs.	Fri.			
Mon.	Tues.	Wed.	Thurs.	Fri.			

Week	Average	Parent Signature	Week	Average	Parent Signature
one	15 = 38%		six		
two	17 = 43%		seven		
three	15 = 38%		eight		
four			nine		
five			ten		

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Study Guide and Intervention

A Plan for Problem Solving

When solving problems, it is helpful to have an organized plan to solve the problem. The following four steps can be used to solve any math problem.

- 1 Explore - Read and get a general understanding of the problem.
- 2 Plan - Make a plan to solve the problem and estimate the solution.
- 3 Solve - Use your plan to solve the problem.
- 4 Examine - Check the reasonableness of your solution.

EXAMPLE 1 SPORTS The table shows the number of field goals made by Henry High School's top three basketball team members during last year's season. How many more field goals did Brad make than Denny?

Name	3-Point Field Goals
Brad	216
Chris	201
Denny	195

$$\begin{array}{r} 216 \\ - 195 \\ \hline 21 \end{array}$$

21 more field goals

Explore You know the number of field goals made. You need to find how many more field goals Brad made than Denny.

Plan Use only the needed information, the goals made by Brad and Denny. To find the difference, subtract 195 from 216.

Solve $216 - 195 = 21$ Brad made 21 more field goals than Denny.

Examine Check the answer by adding. Since $195 + 21 = 216$, the answer is correct.

EXERCISES

- During which step do you check your work to make sure your answer is correct?
- Explain what you do during the first step of the problem-solving plan.

SPORTS For Exercises 3 and 4, use the field goal table above and the four-step plan.

3. How many more field goals did Chris make than Denny?
 subtraction $201 - 195 = 6$

4. How many field goals did the three boys make all together?
 addition $216 + 201 + 195 = 612$ Chris made 6 more field goals than Denny.

$$\begin{array}{r} 216 \\ 201 \\ + 195 \\ \hline 612 \end{array}$$

The boys made 612 field goals all together.

1-1 Practice: Word Problems
A Plan for Problem Solving

Use the four-step plan to solve each problem.
GEOGRAPHY For Exercises 1 and 2, use the poster information about Crater Lake National Park in Oregon.

Visit Crater Lake National Park
90 miles of trails
26 miles of shoreline
Boat tours available
Open 24 hours
Directions from Klamath Falls: Take U.S. Highway 97 north 21 miles, then go west on S.R. 62 for 29 miles.

1. How many more miles of trails are there than miles of shoreline in Crater Lake National Park?	2. How many miles is it from Klamath Falls to Crater Lake National Park?
3. SPORTS Jasmine swims 12 laps every afternoon, Monday through Friday. How many laps does she swim in one week?	4. SPORTS Samantha can run one mile in 8 minutes. At this rate, how long will it take for her to run 5 miles?

5. SPORTS On a certain day, 325 people signed up to play softball. If 15 players are assigned to each team, how many teams can be formed?

6. PATTERNS Complete the pattern: 6, 7, 10, 14, _____

7. SHOPPING Josita received \$50 as a gift. She plans to buy two cassette tapes that cost \$9 each and a headphone set that costs \$25. How much money will she have left?

8. BUS SCHEDULE A bus stops at the corner of Elm Street and Oak Street every half hour between 9 A.M. and 3 P.M. and every 10 minutes between 3 P.M. and 6 P.M. How many times will a bus stop at the corner between 9 A.M. and 6 P.M.?

Handwritten notes for problem 5:
15 players per team
325 / 15 = 21.66...
325 / 15 = 21 R 5
We can form 21 teams with 5 players left over.

Handwritten notes for problem 8:
2 times each hour
4 times an hour
3 PM and 6 PM
4 * 3 = 12
12 + 12 + 1 = 25
25 hours

Lesson 1-1

1-2 Study Guide and Intervention
Divisibility Patterns

A whole number is **divisible** by another number if the remainder is 0 when the first is divided by the second. A whole number is **even** if it is divisible by 2. A whole number is **odd** if it is not divisible by 2.

Rule	Examples
A whole number is divisible by: • 2 if the ones digit is divisible by 2. even number	2, 4, 6, 8, 10, 12, 14, 16, ...
• 3 if the sum of the digits is divisible by 3. add digits	3, 6, 9, 12, 15, 18, 21, 24, ...
• 4 if the number formed by the last two digits is divisible by 4.	4, 8, 12, ..., 104, 108, 112, ...
• 5 if the ones digit is 0 or 5.	5, 10, 15, 20, 25, 30, ...
• 6 if the number is divisible by both 2 and 3.	6, 12, 18, 24, 30, 36, ...
• 9 if the sum of the digits is divisible by 9.	9, 18, 27, 36, 45, ...
• 10 if the ones digit is 0.	10, 20, 30, 40, 50, ...

EXAMPLE 1 Tell whether 112 is divisible by 2, 3, 4, 5, 6, 9, or 10. Then classify the number as *even* or *odd*.

2: Yes; the ones digit is divisible by 2.
3: No; the sum of the digits, 4, is not divisible by 3.
4: Yes; the number formed by the last two digits, 12, is divisible by 4.
5: No; the ones digit is not a 0 or a 5.
6: No; the number is not divisible by 2 and 3.
9: No; the sum of the digits, 4, is not divisible by 9.
10: No; the ones digit, 2, is not 0.
The number 112 is even because it is divisible by 2.

- EXERCISES**
- Tell whether each number is divisible by 2, 3, 4, 5, 6, 9, or 10. Then classify the number as *even* or *odd*.
- | | | |
|-----------|-----------|------------|
| 1. 80 | 2. 93 | 3. 324 |
| 4. 81 | 5. 650 | 6. 23,512 |
| 7. 48 | 8. 268 | 9. 665 |
| 10. 3,579 | 11. 7,000 | 12. 24,681 |
- Tell whether each sentence is *sometimes*, *always*, or *never* true.
13. A number that is divisible by both 2 and 3 is also divisible by 6.
14. Any number that is divisible by 10 is also divisible by 2 and 5.

1) 80

2: ends in 0 \rightarrow even Yes3: $8 + 0 = 8 \div 3 = 3 \overline{)8}$ NO
 $\begin{array}{r} 2 \\ 3 \overline{)8} \\ \underline{-6} \\ 2 \end{array}$ 4: $80 \div 4 = 20$ Yes

5: ends in 0 Yes

6: 2 and 3 must work \rightarrow NO9: $8 + 0 = 8 \div 9 = 9 \overline{)8} = \frac{8}{9}$ NO10: ends in 0 \rightarrow Yes

2, 4, 5, 10

6) 23,512

3: $2 + 3 + 5 + 1 + 2 = 13 \div 3 = 4 \frac{1}{3}$ NO

$$10) \quad 3,57\underline{9}$$

5: ends in 5 or 0 \rightarrow NO

$$11) \quad 7,00\underline{0}$$

2 \rightarrow ends in 0 Yes

3 $\rightarrow 7+0+0+0 = 7 \div 3 = 2\frac{1}{3}$ NO

4 $\rightarrow 100 \div 4 = 25$ Yes

12) 24, 681

2: ends in 1 (odd) NO

3: $2+4+6+8+1 \rightarrow 21 \div 3 = 7$ Yes

4: $81 \div 4 = 20 \frac{1}{4}$ NO

5: ends in 1 NO

6: NO (needs both 2 and 3)

9: $21 \div 9 = 2 \frac{3}{9} = 2 \frac{1}{3}$ NO

10: ends in 1 NO

only 3

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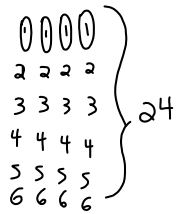
1-2 Practice: Word Problems
Divisibility Patterns

MONTHS OF THE YEAR For Exercises 1-3, use the table that shows how many days are in each month, excluding leap years. (Every four years, the calendar is adjusted by adding one day to February.)

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
31	28	31	30	31	30	31	31	30	31	30	31

<p>1. Which month has a number of days that is divisible by 4? During a leap year, is this still true?</p>	<p>2. Which months have a number of days that is divisible by both 5 and 10? During a leap year, is this still true?</p>
<p>3. The total number of months in a year are divisible by which numbers?</p>	<p>4. FOOD Jermaine and his father are in charge of grilling for a family reunion picnic. There will be 40 people attending. Ground beef patties come in 5 to a package. How many packages of patties should they buy to provide 1 hamburger for each person? Will there be any patties left over? If so, how many? <i>see notes</i> <i>need 40 patties = 8 packages</i> <i>see notes</i></p>
<p>5. RETAIL Li is stacking bottles of apple juice on the shelf at her parent's grocery store. She has space to fit 4 bottles across and 6 bottles from front to back. She has 25 bottles to stack. <u>Will all of the bottles fit on the shelf?</u> <i>Explain</i> <i>No, the bottles will not fit on the shelf because the shelf can only fit 24 bottles.</i></p>	<p>6. FARMING Sally is helping her mother put eggs into egg cartons to sell at the local farmer's market. Their chickens have produced a total of 108 eggs for market. Can Sally package the eggs in groups of 12 so that each carton has the same number of eggs? Explain.</p>

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4) They need to buy 8 packages of patties to feed each person.

No, there will not be any leftovers. They will all be used.

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1-3 Study Guide and Intervention

Prime Factors

Factors are the numbers that are multiplied to get a product. A product is the answer to a multiplication problem. A **prime number** is a whole number that has only 2 factors, 1 and the number itself. A **composite number** is a number greater than 1 with more than two factors.

EXAMPLE 1 Tell whether each number is *prime*, *composite*, or *neither*.

Number	Factors	Prime or Composite?
15	1×15 3×5	Composite
17	1×17	Prime
1	1	Neither

EXAMPLE 2 Find the prime factorization of 18.

18 is divisible by 2, because the ones digit is divisible by 2.
 Circle the prime number, 2.
 9 is divisible by 3, because the sum of the digits is divisible by 3.
 Circle the prime numbers, 3 and 3.
 The prime factorization of 18 is $2 \times 3 \times 3$.

EXERCISES

Tell whether each number is *prime*, *composite*, or *neither*.

1. 7 *prime* 2. 12 *6 · 2 composite*
 4. 81 5. 18 6. 23
 7. 54 8. 28 9. 120 *÷ 10 or ÷ 5 composite*
 10. 243 11. 61 12. 114

Find the prime factorization of each number.

13. 125 14. 44 → *44 → composite*
 15. 11 16. 56

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Lesson 1-3

1-3 Practice: Word Problems
Prime Factors

ANIMALS For Exercises 1-3, use the table that shows the height and weight of caribou.

CARIBOU	Height at the Shoulder		Weights	
	inches	centimeters	pounds	kilograms
Cows (females)	43	107	220	99
Bulls (males)	50	125	400	180

1. Which animal heights and weights are prime numbers?

2. Write the weight of caribou cows in kilograms as a prime factorization.

3. ANIMALS Caribou calves weigh about 13 pounds at birth. Tell whether this weight is a prime or a composite number.

4. SPEED A wildlife biologist once found a caribou traveling at 37 miles per hour. Tell whether this speed is a prime or composite number. Explain.

5. GEOMETRY To find the area of a floor, you can multiply its length times its width. The measure of the area of a floor is 49. Find the most likely length and width of the room.

$A = l \cdot w$
 $49 = l \cdot w$
 $49 = 7 \cdot 7$

6. GEOMETRY To find the volume of a box, you can multiply its length (width) and length. The measure of the volume of a box is 70. Find its possible dimensions.

$V = l \cdot w \cdot h$
 $70 = l \cdot w \cdot h$

prime numbers
 $10 \cdot 7$
 $5 \cdot 2$
 $2 \cdot 5 \cdot 7$

The length of the room and the width of the room are probably 7 units each.

~~1 x 9~~

The box's dimensions could be 2 units by 5 units by 7 units.

1-4 Study Guide and Intervention
Powers and Exponents

A product of prime factors can be written using exponents and a base. Numbers expressed using exponents are called powers. "raised"

Power	Expression	Value
4^2	4 to the second power or 4 squared 4×4	16
5^6	5 to the sixth power $5 \times 5 \times 5 \times 5 \times 5 \times 5$	15,625
7^4	7 to the fourth power $7 \times 7 \times 7 \times 7$	2,401
9^3	9 to the third power or 9 cubed $9 \times 9 \times 9$	729

- EXAMPLE 1** Write $6 \cdot 6 \cdot 6$ using an exponent. Then find the value of the power.
 The base is 6. Since 6 is a factor 3 times, the exponent is 3.
 $6 \cdot 6 \cdot 6 = 6^3$ or 216
- EXAMPLE 2** Write 2^4 as a product. Then find the value of the product.
 The base is 2. The exponent is 4. So, 2 is a factor 4 times.
 $2^4 = 2 \cdot 2 \cdot 2 \cdot 2$ or 16
- EXAMPLE 3** Write the prime factorization of 225 using exponents.
 The prime factorization of 225 can be written as $3 \times 3 \times 5 \times 5$, or $3^2 \times 5^2$.

EXERCISES

Write each product using an exponent. Then find the value of the power.

1. $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^5$

2. $9 \cdot 9 = 9^2 = 81$

3. $3 \cdot 3 \cdot 3 = 3^3$

4. $5 \cdot 5 \cdot 5 = 5^3 = 125$

5. $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 = 3^5$

6. $10 \cdot 10 = 10^2$

Write each power as a product. Then find the value of the product.

7. $7^2 = 7 \cdot 7 = 49$

8. $4^3 = 4 \cdot 4 \cdot 4 = 64$

9. 8^4

10. $5^3 = 5 \cdot 5 \cdot 5 = 125$

11. 2^8

12. 7^3

Write the prime factorization of each number using exponents.

13. 40
 $2 \cdot 2 \cdot 2 \cdot 5 = 2^3 \cdot 5$

14. 75
 $3 \cdot 5 \cdot 5 = 3 \cdot 5^2$

15. 100
 $2 \cdot 2 \cdot 5 \cdot 5 = 2^2 \cdot 5^2$

16. 147
 $3 \cdot 7 \cdot 7 = 3 \cdot 7^2$

1-4 Practice: Word Problems
Powers and Exponents

1. **SPACE** The Sun is about $10 \cdot 10$ million miles away from Earth. Write $10 \cdot 10$ using an exponent. Then find the value of the power. How many miles away is the Sun?

2. **WEIGHT** A 100-pound person on Earth would weigh about $4 \cdot 4 \cdot 4$ pounds on Jupiter. Write $4 \cdot 4 \cdot 4$ using an exponent. Then find the value of the power. How much would a 100-pound person weigh on Jupiter?

3. **ELECTIONS** In the year 2000, the governor of Washington, Gary Locke, received about 10^2 votes to win the election. Write this as a product. How many votes did Gary Locke receive?

4. **SPACE** The diameter of Mars is about 9^2 kilometers. Write 9^2 as a product. Then find the value of the product.

5. **SPACE** The length of one day on Venus is 3^2 Earth days. Express this exponent as a product. Then find the value of the product.

6. **GEOGRAPHY** The area of San Bernardino County, California, the largest county in the U.S., is about $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$ square miles. Write this as a product. What is the area of San Bernardino County?

7. **GEOMETRY** The volume of the block shown can be found by multiplying the width, length, and height. Write the volume using an exponent. Find the volume.

8. **SPACE** A day on Jupiter lasts about 10 hours. Write a product and an exponent to show how many hours are in 10 Jupiter days. Then find the value of the power.

$V = l \cdot w \cdot h$
 $V = 2 \cdot 2 \cdot 2 \rightarrow 2^3 \text{ in}^3$
 $V = 8 \text{ in}^3$
The volume of the cube is 8 in^3 .

$3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$
The area of San Bernardino County is 2187 mi^2

1-5 Study Guide and Intervention start P () []
Order of Operations

Order of Operations
1. Simplify the expressions inside grouping symbols, like parentheses.
2. Find the value of all powers.
3. Multiply and divide in order (from left to right).
4. Add and subtract in order (from left to right).

EXAMPLE 1 Find the value of $48 \div (3 + 3) - 2^2$.

$48 \div (3 + 3) - 2^2 = 48 \div 6 - 2^2$ Simplify the expression inside the parentheses.
 $= 48 \div 6 - 4$ Find 2^2 .
 $= 8 - 4$ Divide 48 by 6.
 $= 4$ Subtract 4 from 8.

EXAMPLE 2 Write and solve an expression to find the total cost of planting flowers in the garden.

Item	Cost Per Item	Number of Items Needed
pack of flowers	\$4	5
bag of dirt	\$3	1
bottle of fertilizer	\$4	1

Words cost of 5 flower packs plus cost of dirt plus cost of fertilizer
Expression $5 \times \$4 + \$3 + \$4$

$5 \times \$4 + \$3 + \$4 = \$20 + \$3 + \$4 = \$27$
The total cost of planting flowers in the garden is \$27.

EXERCISES
Find the value of each expression.

1. $7 + 2 \times 3 \rightarrow 13$
2. $4 + 5 \rightarrow 9$
3. $16 - (4 + 5) \rightarrow 7$
4. $8 \times 6 \div 4$
5. $10 + 14 \div 2$
6. $3 \times 3 + 2 \times 4$
7. $80 - 8 \times 3^2$
8. $11 \times (9 - 2^2)$
9. $25 \div 5 + 6 \times (12 - 4)$

10. **GARDENING** Refer to Example 2. Suppose that the gardener did not buy enough flowers and goes back to the store to purchase four more packs. She also purchases a bag for \$16. Write an expression that shows the total amount she spent to plant flowers in her garden.

$4 \cdot (\$4) + \16
 $16 + 16$
 $+ \rightarrow \$32 \text{ extra}$

$32 + 27 = \$59$
She spent \$59 to plant flowers in her garden.

8) $11 \cdot (9 - 2^2)$
 $11 \cdot (9 - 4)$
 $11 \cdot (5)$
 55

Start ↓ P ✓
 E ✓
 M ✓
 D ✓
 A ✓
 S ✓

9) $25 \div 5 + 6 \times (12 - 4)$
 $25 \div 5 + 6 \times (8)$
 $5 + 6 \times (8)$
 $5 + 48$
 $\begin{array}{r} 48 \\ + 5 \\ \hline 53 \end{array}$

↓ ~~P ✓~~
~~E ✓~~
~~M ✓~~
~~D ✓~~ 1st
 A ✓
~~S ✓~~

1-5 Practice: Word Problems
Order of Operations

MONEY For Exercises 1-3, use the table that shows the price of admission to a movie theater.

Adults:	\$8
Children under 13:	\$5
Matinee before 6 P.M.:	\$3

evening

Lesson 1-5

- Janelle (age 12) and her cousin, Marquita (age 14), go to a 7:00 P.M. show. Write an expression for the total cost of admission. What is the total cost?
- Jan takes her three children and two neighbor's children to a matinee. All of the children are under age 13. Write an expression for the total cost of admission. How much in all did Jan pay for admission?
- Connor (age 13), his sister (age 7), and Connor's parents go to a movie on Saturday night. Write an expression for the total cost. What is the total cost?
- SOCCER Eduardo is 16. Eduardo's dad takes him and his younger sister to a soccer match. Tickets are \$17 for adults and \$13 for children (18 and under). Write an expression for the total cost of the tickets. What is the total cost of the tickets?
- MONEY Frankie orders two hamburgers and a soda for lunch. A hamburger is \$3 and a soda is \$1.00. Write an expression to show how much he paid for lunch. Then find the value of the expression.
- MONEY A store sells barrettes for \$2 each and combs for \$1. Shelby buys 3 barrettes and a comb. Kendra buys 2 barrettes and 4 combs. Write an expression for the amount the two girls spent all together. Find the total amount spent.

Jan paid \$18 for her and the children to go to the movies.
 $(1 + 5) \times 3$
 $(6) \cdot 3$
\$18

$(2 \times \$3) + (1 \times \$1)$
\$6 + \$1
\$7

Frankie paid \$7 for his whole meal

1-6 Study Guide and Intervention
Algebra: Variables and Expressions

- A variable is a symbol, usually a letter, used to represent a number.
- Multiplication in algebra can be shown as $4n$ or $4 \times n$.
- Algebraic expressions are combinations of variables, numbers, and at least one operation.

- EXAMPLE 1** Evaluate $35 + x$ if $x = 6$.
 $35 + x = 35 + 6$ Replace x with 6.
 $= 41$ Add 35 and 6.
- EXAMPLE 2** Evaluate $y + x$ if $x = 21$ and $y = 35$.
 $y + x = 35 + 21$ Replace x with 21 and y with 35.
 $= 56$ Add 35 and 21.
- EXAMPLE 3** Evaluate $4n + 3$ if $n = 2$.
 $4n + 3 = 4 \times 2 + 3$ Replace n with 2.
 $8 + 3$ Find the product of 4 and 2.
 11 Add 8 and 3.
- EXAMPLE 4** Evaluate $4n - 2$ if $n = 5$.
 $4n - 2 = 4 \times 5 - 2$ Replace n with 5.
 $20 - 2$ Find the product of 4 and 5.
 18 Subtract 2 from 20.

- EXERCISES**
- Evaluate each expression if $y = 4$.
- $3 + y \rightarrow 3 + (4) = 7$
 - $y + 8$
 - $4 \times y \rightarrow 4 \cdot (4) = 16$
 - $4 \cdot y \rightarrow 4(4) = 36$
 - $15y \rightarrow 15(4) = 60$
 - $300y$
 - y^2
 - $y^2 + 18$
 - $y^2 + 3 \times 7$
- Evaluate each expression if $m = 3$ and $k = 10$.
- $10 + m$
 - $m \times k$
 - $m + k$
 - $7m + k$
 - $6k + mj$
 - $3k - 4m$
 - $2mk$
 - $5k - 6m$
 - $20m^2 \div k$
 - $m^3 + 2k^2$
 - $21 \cdot \frac{m^2}{k} \div (2 + m)$
 - $20(3) \div (10)$
 - $(3)^3 + 2(10)^2$
 - $(10)^2 \div [2 + (3)]$
 - $60 \div 10$
 - $27 + 2(100)$
 - $(10)^2 \div (5)$

6
 $27 + 200 = 227$
 $100 \div (5) = 20$
 $5 \overline{)100}$
 $\underline{-100}$
 00



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Practice: Word Problems

Algebra: Variables and Expressions

TRAVEL For Exercises 1 and 2, use the table that shows the distance between cities in Arizona.

Arizona Mileage Chart

	Flagstaff	Phoenix	Tucson	Nogales
Phoenix	136 miles		117 miles	181 miles
Tucson	253 miles	117 miles		64 miles
Nogales	317 miles	181 miles	64 miles	

<p>1. To find the speed of a car, use the expression $d \div t$ where d represents the distance and t represents time. Find the speed of a car that travels from Phoenix to Flagstaff in 2 hours.</p>	<p>2. To find the time it will take for a bicyclist to travel from Nogales to Tucson, use the expression d/s where d represents distance and s represents speed. Find the time if the bicyclist travels at a speed of 16 miles per hour.</p>
<p>3. PERIMETER The perimeter of a rectangle can be found using the formula $2\ell + 2w$, where ℓ represents the length and w represents the width. Find the perimeter if $\ell = 6$ units and $w = 3$ units.</p> <div style="text-align: center;"> </div>	<p>4. PERIMETER Another formula for perimeter is $2(\ell + w)$. Find the perimeter of the rectangle in Exercise 3 using this formula. How do the answers compare? Explain how you used order of operations using this formula.</p>
<p>5. SHOPPING Write an expression using a variable that shows how much 3 pairs of jeans will cost if you do not know the price of the jeans. Assume each pair costs the same amount.</p>	<p>6. SHOPPING Write an expression using variables to show how much 3 plain T-shirts and 2 printed T-shirts will cost, assuming that the prices of plain and printed T-shirts are not the same.</p> <p>$x = \text{cost of one plain t-shirt}$ $p = \text{cost of one printed t-shirt}$</p> <p style="text-align: center;">$3x + 2p$</p>



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Study Guide and Intervention

Algebra: Solving Equations

An equation is a sentence that contains an equals sign, =. Some equations contain variables. When you replace a variable with a value that results in a true sentence, you solve the equation. The value for the variable is the solution of the equation.

EXAMPLE 1 Solve $m + 12 = 16$ mentally.

$m + 12 = 16$ Think: What number plus 12 equals 16?
 $3 + 12 = 15$ You know that $12 + 3 = 15$.
 $m = 3$ The solution is 3.

EXAMPLE 2 Solve $14 - p = 6$ using guess and check.

Guess the value of p , then check it out.

Try 7.	Try 6.	Try 8.
$14 - 7 \neq 6$	$14 - 6 \neq 6$	$14 - 8 = 6$
$14 - 7 \neq 6$	$14 - 6 \neq 8$	$14 - 8 = 6$
no	no	yes

The solution is 8 because replacing p with 8 results in a true sentence.

EXERCISES

Identify the solution of each equation from the list given.

- | | | |
|---|-------------------------|---|
| 1. $k - 4 = 13$; 16, 17, 18
$k = 17$ | A. 16
B. 17
C. 18 | 2. $31 + x = 42$; 9, 10, 11
$x = 11$ |
| 3. $45 = 24 + k$; 21, 22, 23 | | 4. $m - 12 = 15$; 27, 28, 29 |
| 5. $88 = 41 + s$; 46, 47, 48
$s = 47$ | | 6. $34 - b = 17$; 16, 17, 18 |
| 7. $69 - j = 44$; 25, 26, 27 | | 8. $h + 19 = 56$; 36, 37, 38
$h = 37$ |

Solve each equation mentally.

- | | | |
|------------------------------|------------------------------|--------------------------------|
| 9. $j + 3 = 9$
$j = 6$ | 10. $m - 5 = 11$
$m = 16$ | 11. $23 + x = 29$
$x = 6$ |
| 12. $31 - h = 24$
$h = 7$ | 13. $18 = 5 + d$
$d = 13$ | 14. $35 - a = 25$
$a = 10$ |
| 15. $y - 26 = 3$
$y = 29$ | 16. $14 + n = 19$
$n = 5$ | 17. $100 = 75 + w$
$w = 25$ |

NAME _____ DATE _____ PERIOD _____
1-7 Practice: Word Problems
 Algebra: Solving Equations

INSECTS For Exercises 1-3, use the table that gives the average lengths of several unusual insects in centimeters.

Insect	Length (cm)	Insect	Length (cm)
Walking stick	15	Giant water bug	6
Goliath beetle	15	Katydid	5
Giant weta	10	Silkworm moth	4
Harlequin beetle	7	Flower mantis	3

1. The equation $15 - x = 12$ gives the difference in length between a walking stick and one other insect. If x is the other insect, which insect is it?

2. The equation $0 + 0 = 13$ gives the length of a Harlequin beetle and one other insect. If y is the other insect, which insect makes the equation a true sentence? *The other insect that makes the equation true is the Giant water bug, which is 6 cm long.*

3. Bradley found a silkworm moth that was 2 centimeters longer than average. The equation $m - 4 = 2$ represents this situation. Find the length of the silkworm moth that Bradley found.

4. BUTTERFLIES A Monarch butterfly flies about 80 miles per day. So far it has flown 60 miles. In the equation $80 - m = 60$, m represents the number of miles it has yet to fly that day. Find the solution to the equation.
 *$m = 20$ miles
 A Monarch butterfly has 20 more miles to fly to complete an 80 mile day.*

5. CICADAS The nymphs of some cicada can live among tree roots for 17 years before they develop into adults. One nymph developed into an adult after only 13 years. The equation $17 - x = 13$ describes the number of years less than 17 that it lived as a nymph. Find the value of x in the equation to tell how many years less than 17 years it lived as a nymph.

6. BEETLES A harlequin beetle lays eggs in trees. She can lay up to 20 eggs over 2 or 3 days. After the first day, the beetle has laid 9 eggs. If she lays 20 eggs in all, how many eggs will she lay during the second and third days?
 $9 + m = 20$
 $m = 11$
The harlequin beetle will lay 11 more eggs on the second and third days.

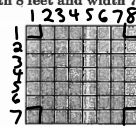
Lesson 1-7

NAME _____ DATE _____ PERIOD _____
1-8 Study Guide and Intervention
 Geometry: Area of Rectangles

The area of a figure is the number of square units needed to cover a surface. You can use a formula to find the area of a rectangle. The formula for finding the area of a rectangle is $A = \ell \times w$. In this formula, A represents area, ℓ represents the length of the rectangle, and w represents the width of the rectangle.

EXAMPLE 1 Find the area of a rectangle with length 8 feet and width 7 feet.

$A = \ell \times w$ Area of a rectangle
 $A = 8 \times 7$ Replace ℓ with 8 and w with 7.
 $A = 56$
 The area is 56 square feet.



EXAMPLE 2 Find the area of a rectangle with width 5 inches and length 6 inches.

$A = \ell \times w$ Area of a rectangle
 $A = 6 \times 5$ Replace ℓ with 6 and w with 5.
 $A = 30$
 The area is 30 square inches.

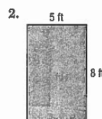


EXERCISES

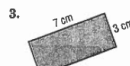
Find the area of each rectangle.



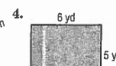
$A = 6 \times 4$
 $A = 24 \text{ units}^2$



$A = 5 \text{ ft} \times 8 \text{ ft}$
 $A = 40 \text{ ft}^2$



$A = 7 \text{ cm} \times 3 \text{ cm}$
 $A = 21 \text{ cm}^2$



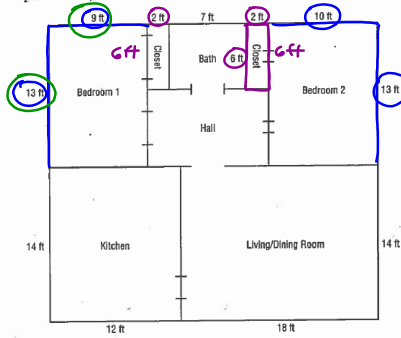
$A = 6 \text{ yd} \times 5 \text{ yd}$
 $A = 30 \text{ yd}^2$

5. What is the area of a rectangle with a length of 10 meters and a width of 7 meters?

6. What is the area of a rectangle with a length of 35 inches and a width of 15 inches?

1-3 Practice: Word Problems
 Geometry: Area of Rectangles

FLOOR PLANS For Exercises 1-6, use the diagram that shows the floor plan for a house.



- | | |
|--|---|
| 1. What is the area of the floor in the kitchen? | 2. Find the area of the living/dining room. |
| 3. What is the area of the bathroom? | 4. Find the area of Bedroom 1. |
| 5. Which two parts of the house have the same area? $A = l \times w$
The closets both have an area of 12 ft^2 . | 6. How much larger is Bedroom 2 than Bedroom 1? |

Handwritten calculations for question 4:

$$\begin{array}{r} 13 \\ \times 9 \\ \hline 117 \end{array} \text{ ft}^2$$

Handwritten calculations for question 6:

$$\begin{array}{r} 13 \\ \times 10 \\ \hline 130 \\ - 117 \\ \hline 13 \end{array} \text{ ft}^2$$

Conclusion: Bedroom 2 is 13 ft^2 larger than Bedroom 1.

