Using Order of Operations

Home Link 4-1

NAME DATE TIME

SRB 98

① Insert parentheses to make the expression equivalent to the target number.

Numerical Expression	Target Number
$8 - 2 + 5$	1
$15 - 3 * 4 + 2$	50
$3 * 5 + 4 * 6$	162

② Simplify each expression.

a. $(3 + 9)^2$ _____ **b.** $2^4 * 2^2$ _____

c. $20 - (6 - 4)$ _____ **d.** $\left(\frac{1}{2} \div \frac{1}{4}\right) * 6$ _____

③ Complete the table.

Exponential Notation	Multiplication Expression	Standard Notation
4^2	$4 * 4$	16
3^3		
	$6 * 6$	
	$7 * 7 * 7 * 7$	

④ Use the given calculator keys to find an expression equivalent to the target number. You may use the keys more than once or not at all.

Keys	Target	Expression
3 2 ^ × + Enter	29	
7 3 ^ × Enter	343	
Try This − 2 ↓ 9 Enter	0.2222 . . .	

Practice

Write the opposite of each number.

⑤ 12 _____ ⑥ -2 _____ ⑦ -3.5 _____ ⑧ $\frac{3}{5}$ _____

Practicing Order of Operations

Home Link 4-2

NAME DATE TIME

In Problems 1–3, tell whether the number sentence is true or false. If it is false, rewrite it with parentheses to make it true.

SRB 203

	Number Sentence	True or False	Correction (If Needed)
1	$4 + 8 \div 4 + 4 = 5$	_____	_____
2	$46 = 3 * 6 + 7 * 4$	_____	_____
3	$15 - 12 \div 3 + 6 \div 2 = 8$	_____	_____

4. Evaluate.

   a. $45 - (1 + 4)^2 + 3$ **b.** $(2 + 4)^2 * (1 + 2)^4$

5. Write an expression for AT LEAST three of the following numbers using six 7s. All values can be found using only addition, subtraction, multiplication, and division.

   1 = _____

   2 = _____

   3 = _____

   4 = _____

   5 = _____

   6 = _____

Practice

Find the greatest common factor.

6. GCF (10, 50) = ____ 7. GCF (80, 24) = ____ 8. GCF (90, 54) = ____

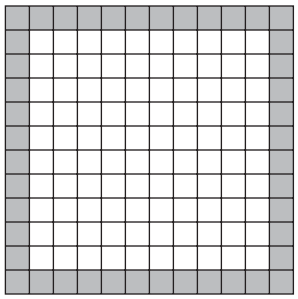
Using Expressions

Home Link 4-3

NAME DATE TIME

SRB 225

(1) **a.** Write a numerical expression for calculating the number of shaded border tiles for the pictured 12-by-12 tiled floor.



_____

Number of shaded tiles: _____

b. Circle the expressions below that also represent the number of shaded tiles in the 12-by-12 tiled floor.

$11 + 11 + 11 + 11$ $4 * 12 + 4$ $(12 - 2) + (12 - 2) + 12 + 12$ $4 * 12 - 2$

c. Choose one of the expressions you circled in Part b and explain how it represents the number of shaded tiles.

_____

_____

_____

(2) A rectangular tiled floor is shown at the right. Write an expression that models how you can find the number of shaded tiles in the 3-by-10 rectangular floor.

_____ Number of shaded tiles: _____

(3) Write an expression that models how you can find the number of shaded tiles in the 3-by-13 rectangular floor shown at the right.

_____ Number of shaded tiles: _____

Try This

(4) Write an algebraic expression for the number of shaded tiles in a 3-by-*n* rectangular floor. Use your expression to find the number of shaded tiles in a 3-by-125 tiled floor.

_____

Practice

Find the least common multiple.

(5) LCM (3, 5) = ____ (6) LCM (10, 12) = ____ (7) LCM (6, 12) = ____

Algebraic Expressions

Home Link 4-4

NAME DATE TIME

SRB 212-214

Write an algebraic expression. Use your expression to solve the problem.

(1) Kayla has x hats. Miriam has 6 fewer hats than Kayla. _____

If Kayla has 22 hats, how many hats does Miriam have? _____

(2) The width of Rectangle A is half of its height.
Write an algebraic expression for the width of Rectangle A.

a. Define your variable. Let ____ represent _____.

b. Algebraic expression: _____

c. Using the variable you defined in Part a, write an algebraic expression for the perimeter of Rectangle A. _____

(3) Larry ran 2.5 miles more than Jusef.
Write an algebraic expression for how far Larry ran.

a. Define your variable. Let ____ represent _____.

b. Algebraic expression: _____

c. If Jusef ran 5 miles, how many miles did Larry run? _____

(4) For each situation, choose an expression from the box that matches the situation, and write it in the matching blank. You may use an expression more than once.

$n \div 25$	$2n + 4$	$n \div 4$	$4n + 2$
$4n$	$n - 4$	$n + 4$	$25 \div n$

a. With 4 bags of n potatoes, the total number of potatoes is _____.

b. If you exchange n quarters for dollars, you get _____ dollars.

c. There are n pens in a box. Denise has 4 pens more than 2 boxes of pens.

The total number of pens Denise has is _____.

Practice

Use $<$, $>$, or $=$ to make the number sentence true.

(5) $\frac{3}{4}$ ____ $\frac{3}{7}$ (6) 0.4 ____ 0.400 (7) 0.8 ____ 0.67

Equations

Home Link 4-5

NAME DATE TIME

(1) Look for a pattern in the set of numerical equations. Describe the pattern in words. Use a variable and write an equation that represents the pattern.

SRB 226-227

$3^6 = 3^2 * 3^4$ $58^6 = 58^2 * 58^4$ $(0.25)^6 = (0.25)^2 * (0.25)^4$

a. Description: _____

_____

b. Equation that generalizes the pattern: _____

c. Write two more examples of the pattern: _____

_____

(2) For each equation, circle the number of solutions you could find.

a. $c + c = 2 * c$	Many	None	One
b. $28 = t - 2$	Many	None	One
c. $m - 1 = m - 2$	Many	None	One

(3) Circle the answer that best describes each equation.

a. $c + c = 2 * c$	Always true	Never true	Cannot tell
b. $28 = t - 2$	Always true	Never true	Cannot tell

(4) Explain your answer to Problem 3b. _____

_____

Try This

(5) The numbers 4, 5, and 6 are called *consecutive numbers* because they follow each other in order. The sum of 4, 5, and 6 is 15—that is, $4 + 5 + 6 = 15$. Circle all equations that generalize finding a sum of 170 for three consecutive numbers.

a. $x + 2x + 3x = 170$ **b.** $170 = x + (x + 1) + (x + 2)$ **c.** $3x + 3 = 170$

Practice

Estimate whether each sum is closest to 0, $\frac{1}{2}$, 1, or $1\frac{1}{2}$.

(6) $\frac{8}{9} + \frac{5}{8}$ _____ (7) $\frac{1}{10} + \frac{1}{11}$ _____ (8) $\frac{5}{6} + \frac{2}{16}$ _____

The Distributive Property

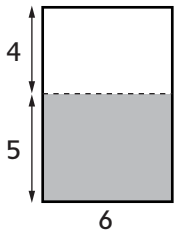
Home Link 4-6

NAME DATE TIME

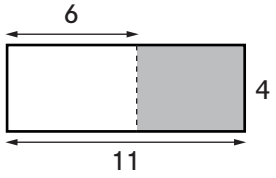
SRB 204-205

(1) Each of the expressions describes the area of the shaded part of one of the rectangles. Write the letter of the correct rectangle next to each expression.

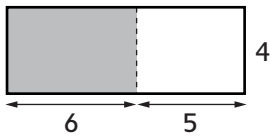
Rectangle J



Rectangle K



Rectangle L



a. $4 * (11 - 6)$ _____

b. $44 - 20$ _____

c. 30 _____

d. $(6 * 9) - (6 * 4)$ _____

e. $(4 * 11) - (4 * 6)$ _____

f. $(11 - 5) * 4$ _____

g. $(11 * 4) - (5 * 4)$ _____

h. $6 * (9 - 4)$ _____

(2) Circle the equations that are examples of the Distributive Property.

a. $(80 * 5) + (120 * 5) = (80 + 120) * 5$

b. $6 * (3 - 0.5) = (6 * 3) - 0.5$

c. $\left(9 * \frac{3}{8}\right) - \left(\frac{2}{3} * \frac{3}{8}\right) = \left(9 - \frac{2}{3}\right) * \frac{3}{8}$

d. $(16 * 4) + 12 = (16 + 12) * (4 + 12)$

Write an equation to show how the Distributive Property can help you solve each problem.

(3) Kelly signed copies of her new book at a local bookstore. In the morning she signed 36 books, and in the afternoon she signed 51 books. It took her 5 minutes to sign a book. How much time did she spend signing books?

Equation: _____ Solution: _____

(4) Mr. Katz gave a party because all the students scored 100% on their math tests. He had budgeted $1.15 per student. It turned out that he spent $0.25 less per student. How much money did he spend for 30 students?

Equation: _____ Solution: _____

Practice Write the reciprocal.

(5) 5 _____

(6) $\frac{2}{9}$ _____

(7) $3\frac{1}{3}$ _____

Applying the Distributive Property

Home Link 4-7

NAME DATE TIME

(1) Match each property with a generalized form of the property.

SRB 204-205 231-232

Commutative Property of Addition	$a * (b * c) = (a * b) * c$
Commutative Property of Multiplication	$a * b = b * a$
Associative Property of Addition	$a * (b + c) = ab + ac$
Associative Property of Multiplication	$(a * b) - (a * c) = a * (b - c)$
Distributive Property of Multiplication over Addition	$a + b = b + a$
	$(a + b) + c = a + (b + c)$
Distributive Property of Multiplication over Subtraction	

(2) For each equation below, use general equations for properties to determine whether it is true or false. For each true number sentence, list the property or properties that apply. For false number sentences, write "None."

a. $(9 - 4) * 3 = (9 - 3) * (4 - 3)$ _____ Property: _____

b. $(8 + 5) * 2 = (8 + 2) * (5 + 2)$ _____ Property: _____

c. $(8 + 5) * 2 = 2 * (8 + 5)$ _____ Property: _____

Use the Distributive Property to solve Problems 3–4.

(3) Show how to solve the problems mentally.

a. $85 * 101 =$ _____

b. $156 * 9 =$ _____

c. $48 * 24 =$ _____

(4) Rewrite each expression as a product by taking out a common factor.

a. $48 + 24 =$ _____ $*$ (_____ $+$ _____) $=$ _____ $*$ _____

b. $72 - 56 =$ _____ $*$ (_____ $-$ _____) $=$ _____ $*$ _____

c. $(2y) + (3 * y) =$ (_____ $+$ _____) $*$ _____ $=$ _____ $*$ _____

Practice

Use $<$, $>$, or $=$ to make the sentence true.

(5) $\frac{2}{3}$ ____ $\frac{2}{5}$ (6) 0.7 ____ $\frac{4}{5}$ (7) 0.3 ____ 0.23 (8) $1\frac{1}{4}$ ____ 1.25

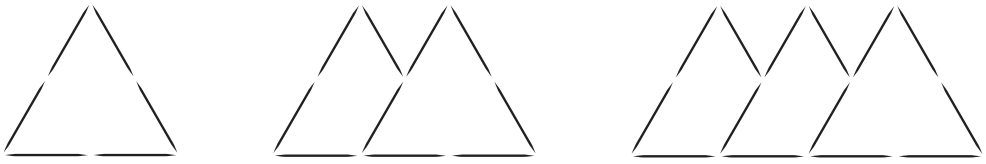
Building with Toothpicks

Home Link 4-8

NAME DATE TIME

Yaneli is building a pattern with toothpicks. The pattern grows in the following way:

SRB 225



Design 1 Design 2 Design 3

1. How many toothpicks are needed for Design 5? _____

2. How many toothpicks are needed for Design 10? _____

3. Describe in words how you see the toothpick design growing. What stays the same from one figure to the next? What changes?

_____

_____

4. Write an expression to represent how many toothpicks are needed for Design *n*?

_____

5. What toothpick design number could you build with exactly 82 toothpicks? _____

6. Describe how you can figure out the number of toothpicks you need for any design number.

_____

_____

_____

Practice

Evaluate each expression.

7. $7^2 =$ _____

8. _____ $= 2^4$

9. $1^5 =$ _____

10. $4^3 =$ _____

Inequalities

Home Link 4-9

NAME DATE TIME

SRB 210-211

(1) Amelia's cell phone plan lets her send a maximum of 500 text messages per month.

Define a variable. _____

Write an inequality to represent Amelia's situation. _____

(2) The temperature in the freezer should be no higher than −18°C.

Define a variable. _____

Write an inequality to represent the situation. _____

(3) Sam scored 68 in miniature golf. What score would beat Sam's score?

Define a variable: _____

Write an inequality to represent the situation. _____

(4) Choose the number sentence that represents each statement.

$x \geq 42$	$x > 42$
$x \leq 42$	$x < 42$

a. A number is less than 42. _____

b. A number is greater than 42. _____

c. A number is at least 42. _____

d. A number is no greater than 42. _____

Practice

(5) _____ = 5.6 + 11.7

(6) 9.2 + _____ = 12.1

(7) 19.37 − 9.29 = _____

(8) _____ = 0.834 − 0.75

Solving and Graphing Inequalities

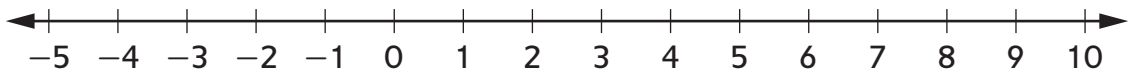
Home Link 4-10

NAME DATE TIME

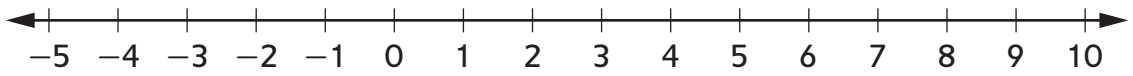
Describe the solution set for each inequality.
Graph the solutions for each inequality.

SRB 210-211

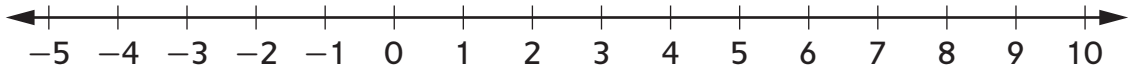
(1) **a.** $5 < n$ _____



b. $q < 5$ _____

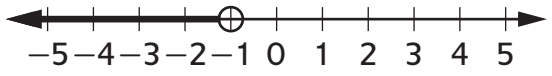


c. $w > -3$ _____



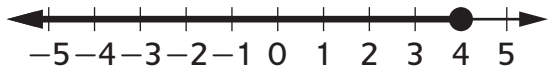
(2) Write the inequality represented by each graph below.

a.



_____

b.



_____

c. List three numbers that are part of the solution set for Part a.

_____

(3) **a.** Write an inequality with a solution set that is all numbers less than 0. _____

b. Find three numbers that are not in the solution set for Part a.

_____

c. Write an inequality with a solution set that does not have any numbers in common with the solution set in Part a or the numbers you wrote in Part b.

_____

Practice

Solve.

(4) $3.45 * 2 =$ _____ (5) $3.2 * 4.5 =$ _____ (6) _____ $= 1.53 * 3.3$

Graphing Alligator Facts

Home Link 4-11

NAME DATE TIME

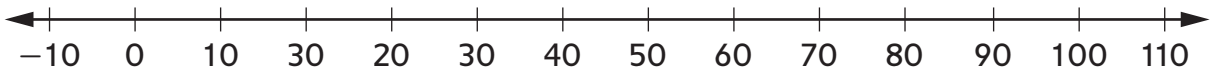
(1) If the temperature of an alligator nest is below 86°F, the female alligators hatch.

SRB 210-211

Define a variable: _____

Represent the statement with inequalities: _____

Graph the solution set that makes both inequalities true.



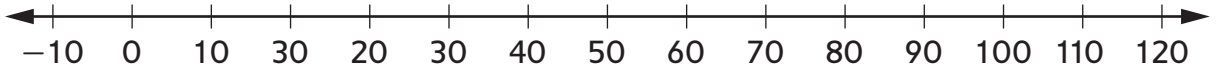
Describe how your graph represents the situation.

_____

(2) If the temperature of an alligator nest is above 93°F, the male alligators hatch. Use the same variable you used in Problem 1.

Represent the statement with inequalities: _____

Graph the solution set that makes both inequalities true.

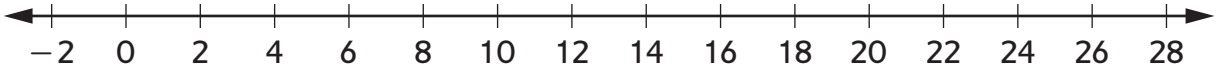


(3) Adult alligators are at least 6 feet long. The longest one on record was 19 feet.

Define a variable: _____

Represent the statement with inequalities: _____

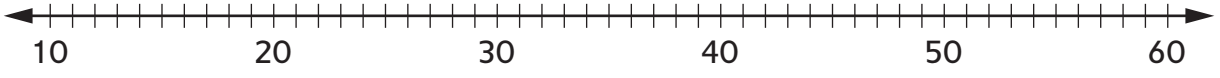
Graph the solution set that makes both inequalities true.



(4) Alligators lay 20–50 eggs in a clutch. Variable: _____

Represent the statement with inequalities: _____

Graph the solution set that makes both inequalities true.



Describe how your graph represents the situation.

_____

Practice Evaluate.

(5) 15% of 60 _____ (6) 25% of 300 _____ (7) 250% of 18 _____

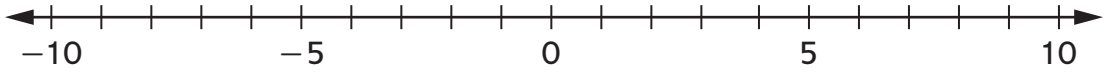
Absolute Value

Home Link 4-12

NAME DATE TIME

(1) **a.** On the number line, plot points at two numbers whose absolute values are 8.

SRB 92-93



b. Explain why you get a positive number when you take the absolute value of a negative number.

_____

_____

(2) Complete.

a. $|20| =$ _____ **b.** $|8.25| =$ _____ **c.** $|-79| =$ _____

d. $|-0.004| =$ _____ **e.** $|-10\frac{1}{2}| =$ _____ **f.** $|0| =$ _____

(3) Find at least three numbers that answer each riddle.

a. A number with an absolute value that is equal to itself _____

b. A number with an absolute value that is its opposite _____

(4) Make up your own absolute value riddle.

_____

_____

Try This

(5) Find at least three numbers that make each statement true.

a. $|x| = -x$ _____

b. $|x| > -x$ _____

Practice

Divide. Express your remainder as a fraction.

(6) $8\overline{)3{,}254}$

(7) $52\overline{)7{,}859}$

Using Absolute Value

Home Link 4-13

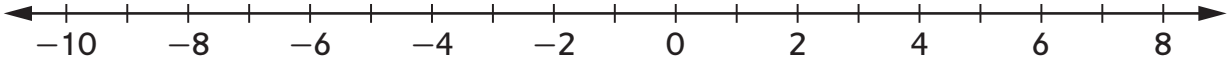
NAME DATE TIME

SRB 92-93

For Problems 1–2, do the following:

- Plot the numbers on the number line.
- Answer the question.
- Circle the number model that supports your answer.

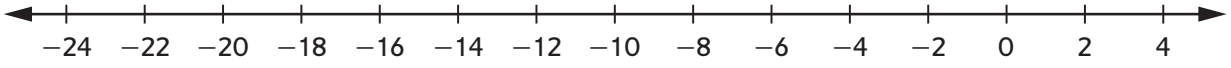
(1) The freezing point of water is 0°C. In Chicago, it is −7°C. In Montreal, it is −9°C.



Which city's temperature is farther from 0? _____

$-7 > -9$ or $|-9| > |-7|$

(2) Rita has a debt of $14, and Jamal has a debt of $18.



Whose balance is farther from 0? _____

$|-18| > |-14|$ or $-18 < -14$

(3) Explain how you know whether you need to use absolute value to answer the question. What do you have to consider?

_____

(4) Find the distance between the ordered pairs.

a. (−2, −1) and (−2, 3) Distance: _____

b. (−2, 3) and (3, 3) Distance: _____

c. (3, −1) and (3, −4.5) Distance: _____

d. (−11, 9) and (−11, −32) Distance: _____

Practice Solve.

(5) $2\frac{1}{2} \div \frac{3}{4} =$ _____ (6) $1\frac{2}{3} \div \frac{1}{3} =$ _____ (7) $3\frac{3}{4} \div \frac{1}{3} =$ _____

Temperatures in Seattle

Home Link 4-14

NAME DATE TIME

The city of Seattle is located in the state of Washington.
It is located 113 miles south of the U.S.–Canadian border at a latitude of 47°37' N.
The city is located at sea level on Puget Sound, near the Pacific Ocean.

SRB 291-294

(1) Use the information above to predict whether Seattle's monthly average temperature data will have a large or small mean absolute deviation. Explain your answer.

(2) The average monthly temperatures for Seattle are given below. Find the listed data landmarks and measures of spread. Round your answers to the nearest tenth.

Average Monthly Temperatures (°F)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
41	43	46	50	56	61	65	66	61	53	45	41

a. Minimum: _____ **b.** Maximum: _____ **c.** Median: _____

d. Mean: _____ **e.** Range: _____ **f.** Mean absolute deviation: _____

(3) Use the data landmarks and measures of spread you found in Problem 2 to draw some conclusions about Seattle's average monthly temperatures.

Bring in one 3-dimensional shape with faces made up of polygons. It will go in the class Shapes Museum. Find a shape that has at least one face that is not a rectangle. See pages 246–248 in your* Student Reference Book *for examples of the kinds of shapes to bring.

Practice Solve.

(4) _____ = 0.09 ÷ 0.03

(5) 0.75 ÷ 0.3 = _____

(6) 24 ÷ 0.48 = _____

(7) _____ = 5.2 ÷ 1.6