Name _____ Class _____ Date _____

1-1 Game: Matching Expressions

Variables and Expressions

This is a game for two players. Cut out the *algebraic expressions* from the top table, mix them up, and place them in a stack with the expressions face down. Then cut out the *verbal expressions* from the bottom table and arrange them face down on your desk in 4 rows and 5 columns.

Player 1 picks the top card from the *algebraic expressions* stack. He or she then turns over a card from the *verbal expressions* arrangement. If the *algebraic expression* matches the *verbal expression,* the player keeps both cards. If there is no match, then the player places the *algebraic expression* at the bottom of the stack and places the *verbal expression* in the same location as it originally was.

Players take turns trying to find correct matches. The player with the most matches wins. The key is to try to remember the locations of the *verbal expressions*.

$\frac{w}{17}$	$\frac{3}{a} - 10$	$2(t - 15)$	$\frac{5}{8}b$	$8 + \frac{d}{15}$
$4(x + 5)$	$5j + 20$	$6z$	$2 + \frac{7}{k}$	$\frac{9}{14(g + 5)}$
$\frac{10}{3 + h}$	$\frac{y}{6}$	$p - 5$	$\frac{g}{9} - 5$	$11q - 8$
$12m$	$11 + \frac{u}{8}$	$15(t - 8)$	$17f$	$4 - \frac{5}{c}$

the sum of 2 and the quotient of 7 and a number	the product of 4 and the sum of a number and 5	the quotient of 10 and the sum of 3 and a number	8 less than the product of 11 and a number	the product of 6 and a number
5 less than a number	the product of 17 and a number	9 divided by the product of 14 and 5 more than a number	the product of a number and the quotient of 5 and 8	12 times a number
the difference of 4 and the quotient of 5 and a number	the product of 2 and the difference of a number and 15	11 more than the quotient of a number and 8	20 more than the product of 5 and a number	the quotient of a number and 17
8 plus the quotient of a number and 15	the product of 15 and the difference of a number and 8	the quotient of a number and 6	10 less than the quotient of 3 and a number	5 less than one-ninth of a number

Row 1: $2 + \frac{7}{k}$; $4(x + 5)$; $\frac{10}{3 + h}$; $11q - 8$; $6z$ **Row 2:** $p - 5$; $17f$; $\frac{9}{14(g + 5)}$; $\frac{5b}{8}$; $12m$

Row 3: $4 - \frac{5}{c}$; $2(t - 15)$; $11 + \frac{u}{8}$; $5j + 20$; $\frac{w}{17}$ **Row 4:** $8 + \frac{d}{15}$; $15(t - 8)$; $\frac{y}{6}$; $\frac{3}{a} - 10$; $\frac{g}{9} - 5$

Name _____ Class _____ Date _____

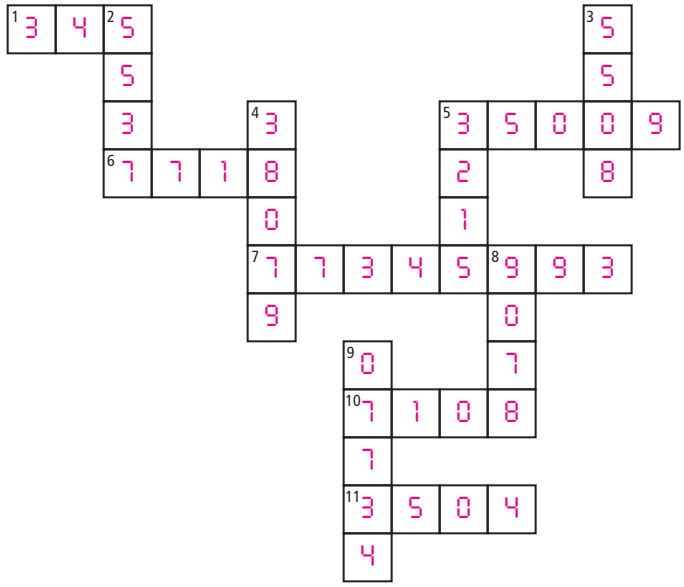
1-2 Puzzle: Calc-Words

Order of Operations and Evaluating Expressions

Instead of entering a letter in each box of this crossword puzzle, write a digit! Draw the digit in each box so it looks like you typed it using your calculator.

0 1 2 3 4 5 6 7 8 9

To check your answers, turn this page upside down. If each horizontal or vertical group of numbers forms a word, then your answers are correct!



ACROSS

1. Find the value of $x^3 + 2y^3$ for $x = 7$ and $y = 1$. **345**

5. Simplify $524 + 55 \cdot 627$. **35009**

6. What is the value of $2x^3 + 4x^2 + 4x + 8$ when $x = 15$? **7718**

7. Simplify $1583 + 7986 \cdot 9685$. **77345993**

10. Find the value of $12 \div 2 + 4 + 78 \cdot 91$. **7108**

11. What is the simplified form of $2^4 \cdot 3(9 \cdot 8 + 1)$? **3504**

DOWN

2. Evaluate $2x^4 + 2x^3 + x^2$ when $x = 7$. **5537**

3. Find the value of $x^2 + 2xy + 3y^2$ for $x = 70$ and $y = 4$. **5508**

4. What is the simplified form of $351 + 524 \cdot 72$? **38079**

5. Evaluate $5(x^5 + y^2)$ when $x = 3$ and $y = 20$. **3215**

8. What is the value of $11x^2 - 6x + 1$ when $x = 29$? **9078**

9. Find the value of $x^2 + 3x + 0.2345$ when $x = 0.17$. (Include the leading zero and ignore the decimal point.) **0.7734**

Name _____ Class _____ Date _____

1-3 Activity: Inequality Ski Trail

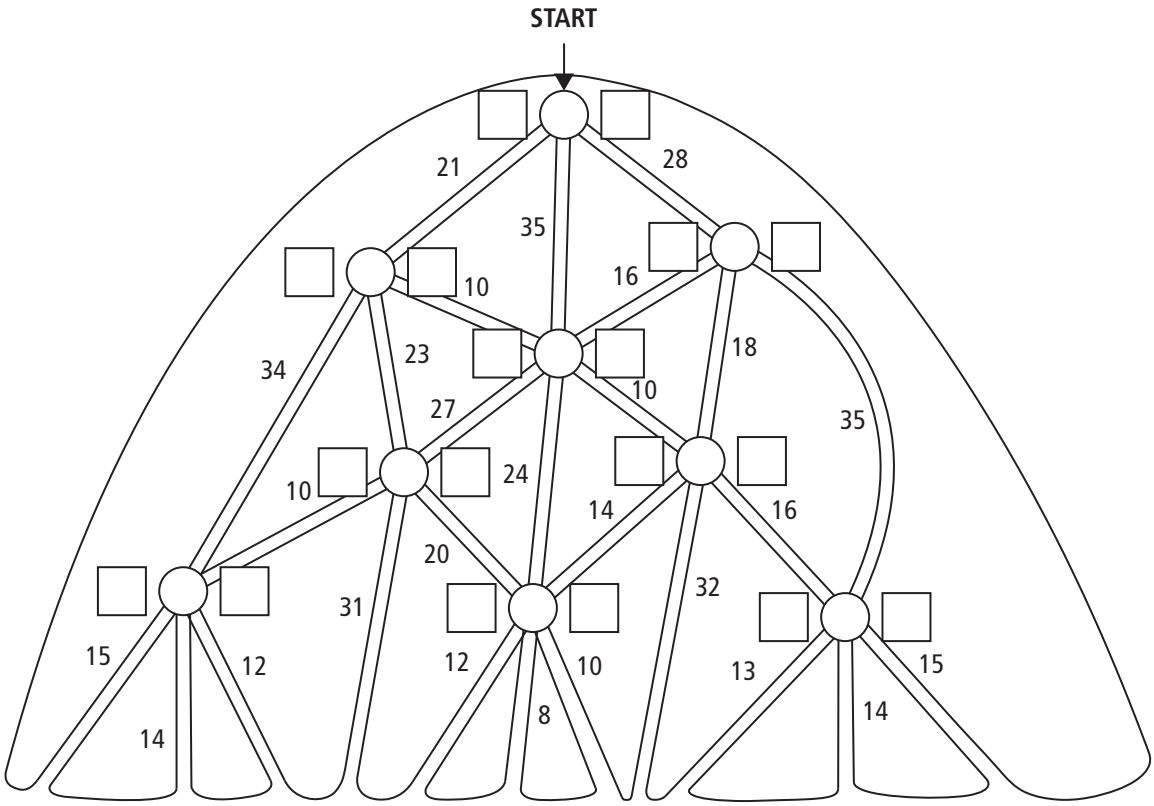
Real Numbers and the Number Line

In this activity, you will ski down the trail shown below. You can work with a partner and then discuss your results as a class when everyone has finished.

Begin by filling in the 18 boxes with the 18 numbers below. You can place the numbers anywhere you want. Use each number once. After filling in the numbers, determine the path to take by identifying the symbol ($<$, $=$, $>$) that correctly relates the two numbers. Place the correct symbol in the circle. If the symbol is $<$, take the left path down the trail. If the symbol is $=$, take the middle path. If the symbol is $>$, take the right path.

After you have completed the trail, find the time it took you to ski down. The times (in seconds) are shown next to each of the paths. Compare your time with your partner's and other classmates. **Check students' work.**

-0.4	$-\frac{7}{8}$	0.32	$-\frac{1}{2}$	0.75	$-\frac{5}{12}$	0.09	-0.1	$\frac{3}{4}$
-0.9	$\frac{2}{3}$	-0.5	$\frac{1}{9}$	$-\frac{2}{5}$	0.2	0.6	0.625	$\frac{1}{2}$



Name ______________________ Class ____________ Date ____________

1-4 Game: You've Got My Property

Properties of Real Numbers

This is a game for two players. The top table lists 24 equations, and the bottom table lists eight properties three different times. The object of the game is to match each equation with the property it describes.

Decide which player goes first. Player 1 starts by matching any equation with its property. After each match, use a pencil to cross out both the equation and the property. A player can match as many as three equations with their properties in a single turn. Players check each other's matches after each one is given. An incorrect answer results in the other player taking over, and the equation and property are still in play. The winner of the game is the player who crosses off the last match. The strategy is to match just enough equations and properties so that you will be able to select the last one! **Check students' work.**

$9 + \sqrt{w} = \sqrt{w} + 9$	$(f \cdot g) \cdot h = f \cdot (g \cdot h)$	$a \cdot 0 = 0$	$-1 \cdot s = -s$
$(5q) \cdot (4p) = (4p) \cdot (5q)$	$-1 \cdot (49b) = -(49b)$	$(2x + 3y) + 5z = 2x + (3y + 5z)$	$k + 0 = k$
$2\sqrt{j} + 0 = 2\sqrt{j}$	$c + d = d + c$	$14 \cdot 1 = 14$	$(5 \cdot 9) \cdot 3 = 5 \cdot (9 \cdot 3)$
$(19 + 5) + 7 = 19 + (5 + 7)$	$(3x) \cdot 1 = 3x$	$u \cdot v = v \cdot u$	$28 \cdot 0 = 0$
$n \cdot 1 = n$	$1\frac{7}{8} \cdot 0 = 0$	$36 + 0 = 36$	$(m + n) + p = m + (n + p)$
$(5r \cdot s) \cdot t = 5r \cdot (s \cdot t)$	$8 + 13 = 13 + 8$	$-1 \cdot \sqrt{7} = -\sqrt{7}$	$6(8) = 8(6)$

Commutative Property of Addition	Associative Property of Addition	Identity Property of Addition	Zero Property of Multiplication
Commutative Prop. of Multiplication	Associative Prop. of Multiplication	Identity Property of Multiplication	Multiplicative Property of -1
Commutative Property of Addition	Associative Property of Addition	Identity Property of Addition	Zero Property of Multiplication
Commutative Prop. of Multiplication	Associative Prop. of Multiplication	Identity Property of Multiplication	Multiplicative Property of -1
Commutative Property of Addition	Associative Property of Addition	Identity Property of Addition	Zero Property of Multiplication
Commutative Prop. of Multiplication	Associative Prop. of Multiplication	Identity Property of Multiplication	Multiplicative Property of -1

Name _____ Class _____ Date _____

1-5 Puzzle: That's Sum Puzzle!

Adding and Subtracting Real Numbers

Puzzle 1

Use the numbers {19, 25, 34, 47, 78, 94} to fill in the blank squares in the table below. Each number can only be used once. Arrange the numbers so that the sum of the numbers in the first row is 295, and the sum of the numbers in the second row is 120. The differences down each column must equal 28, 36, 42, and 69, from left to right.

					Sums
Row 1	47	78	76	94	295
Row 2	19	42	34	25	120
Differences	28	36	42	69	

Puzzle 2

Use the fractions $\left\{\frac{1}{6}, \frac{7}{30}, \frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{2}{3}\right\}$ to fill in the blank squares in the table below. Each fraction can be used only once. Arrange the fractions so that the sum of the fractions in the first row is 2, and the sum of the fractions in the second row is 1. In addition, the differences down each column must equal $\frac{1}{15}, \frac{17}{30}, \frac{1}{10}$, and $\frac{4}{15}$, from left to right.

					Sums
Row 1	$\frac{7}{30}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{3}{5}$	2
Row 2	$\frac{1}{6}$	$\frac{1}{10}$	$\frac{2}{5}$	$\frac{1}{3}$	1
Differences	$\frac{1}{15}$	$\frac{17}{30}$	$\frac{1}{10}$	$\frac{4}{15}$	

1-6 Activity: A Class Divided

Multiplying and Dividing Real Numbers

Cut out the squares from the top grid and give the squares to half the class. Then cut out the squares from the bottom grid and give the squares to the other half of the class. If you do not pass out all of the squares from the top grid, be sure to only pass out the corresponding squares from the bottom grid. For example, if you pass out the top two rows from the top grid, be sure to pass out the top two rows from the bottom grid.

This activity should take no more than 10 to 15 minutes. Stress to students beforehand that they are only allowed to read aloud the expression on their classmates' square.

$2 \cdot 8$	$6 \cdot 3 + 4$	$4 \cdot 10$	$5 \cdot 5$	$-\frac{16}{4}$
$10 \cdot 4$	$2 \cdot 3 + 12$	$-14 \cdot 3$	$(-6)(-6)$	5
$\frac{90}{10}$	$\frac{60}{-2}$	$\frac{14}{-7}$	$-4 \cdot 5 + 10$	$5 \cdot 4 + 4$

$(-4)(-4)$	$(-11)(-2)$	$8 \cdot 5$	$\frac{-75}{-3}$	$\frac{12}{-3}$
$2 \cdot 20$	$9 \cdot 2$	$-6 \cdot 7$	$12 \cdot 3$	$\frac{15}{3}$
$(-3)(-3)$	$-2 \cdot 15$	$4 - 2 \cdot 3$	$-5 \cdot 2$	$8 \cdot 3$

Name _____ Class _____ Date _____

1-6 Activity: A Class Divided

Multiplying and Dividing Real Numbers

Your teacher will give you a square with expressions involving multiplication and division. Each expression has a matching equivalent expression. Use mental math to evaluate the expression on your square. Then walk around the class to find the classmate who has the square with the equivalent expression. For example, if your square shows the expression $6 \cdot 4 + 11$, then your expression equals 35 and you will need to find the classmate whose expression also equals 35.

- When you approach a classmate, you are only allowed to read aloud the expression on the classmate's square, and the classmate is only allowed to read aloud the expression on your square. You cannot say anything more.
- When you find the matching square, you and your classmate should return both squares to your teacher to see if you are indeed correct.

$2 \cdot 8$	$6 \cdot 3 + 4$	$4 \cdot 10$	$5 \cdot 5$	$-\frac{16}{4}$
$10 \cdot 4$	$2 \cdot 3 + 12$	$-14 \cdot 3$	$(-6)(-6)$	5
$\frac{90}{10}$	$\frac{60}{-2}$	$\frac{14}{-7}$	$-4 \cdot 5 + 10$	$5 \cdot 4 + 4$

$(-4)(-4)$ $2 \cdot 8$	$(-11)(-2)$ $6 \cdot 3 + 4$	$8 \cdot 5$ $4 \cdot 10$	$\frac{-75}{-3}$ $5 \cdot 5$	$\frac{12}{-3}$ $-\frac{16}{4}$
$2 \cdot 20$ $10 \cdot 4$	$9 \cdot 2$ $2 \cdot 3 + 12$	$-6 \cdot 7$ $-14 \cdot 3$	$12 \cdot 3$ $(-6)(-6)$	$\frac{15}{3}$ 5
$(-3)(-3)$ $\frac{90}{10}$	$-2 \cdot 15$ $\frac{60}{-2}$	$4 - 2 \cdot 3$ $\frac{14}{-7}$	$-5 \cdot 2$ $-4 \cdot 5 + 10$	$8 \cdot 3$ $5 \cdot 4 + 4$

Name _____ Class _____ Date _____

1-7 Game: Algebra Baseball

The Distributive Property

You and a partner will each need four pennies and two number cubes for this game. You and a classmate will represent two baseball teams. Each team will alternate turns for 7 innings. Each turn starts with an at bat. Use pennies to represent your players.

For each at bat, place a penny at home plate and roll a number cube twice. Use the table at the right to determine the values of your two rolls. For example, if your first roll is 2, then your first value is 3. If your second roll is 5, then your second value is 0.52.

Roll	1	2	3	4	5	6
Value 1	2	3	4	5	7	9
Value 2	0.19	0.22	0.37	0.41	0.52	0.69

Use mental math to multiply the two values. For example, a roll of a 2and a 5 means you multiply 3 and 0.52. By the Distributive Property, $3(0.50 + 0.02) = 1.50 + 0.06 = 1.56$.

Use the table at the right to determine the result. For example, 1.56. results in a double. This means you move your penny two bases to second base.

	Product
Single	0.74, 1.11, 2.59, 2.60, 3.64, 4.68
Double	0.82, 1.56, 2.87, 3.69
Triple	0.66, 1.04
Home Run	0.76, 1.23, 2.05, 3.45

Rules

- When a penny reaches home plate, you score a run.
- A single means you move all pennies one base.
- A double means you move all pennies two bases.
- A triple means you move all pennies three bases.
- A home run means all pennies on base, as well as the one at home plate, score.
- A player who cannot find the product in the table makes an out.
- A player who commits a math error also makes an out.
- After three outs, the other team gets a chance to bat.

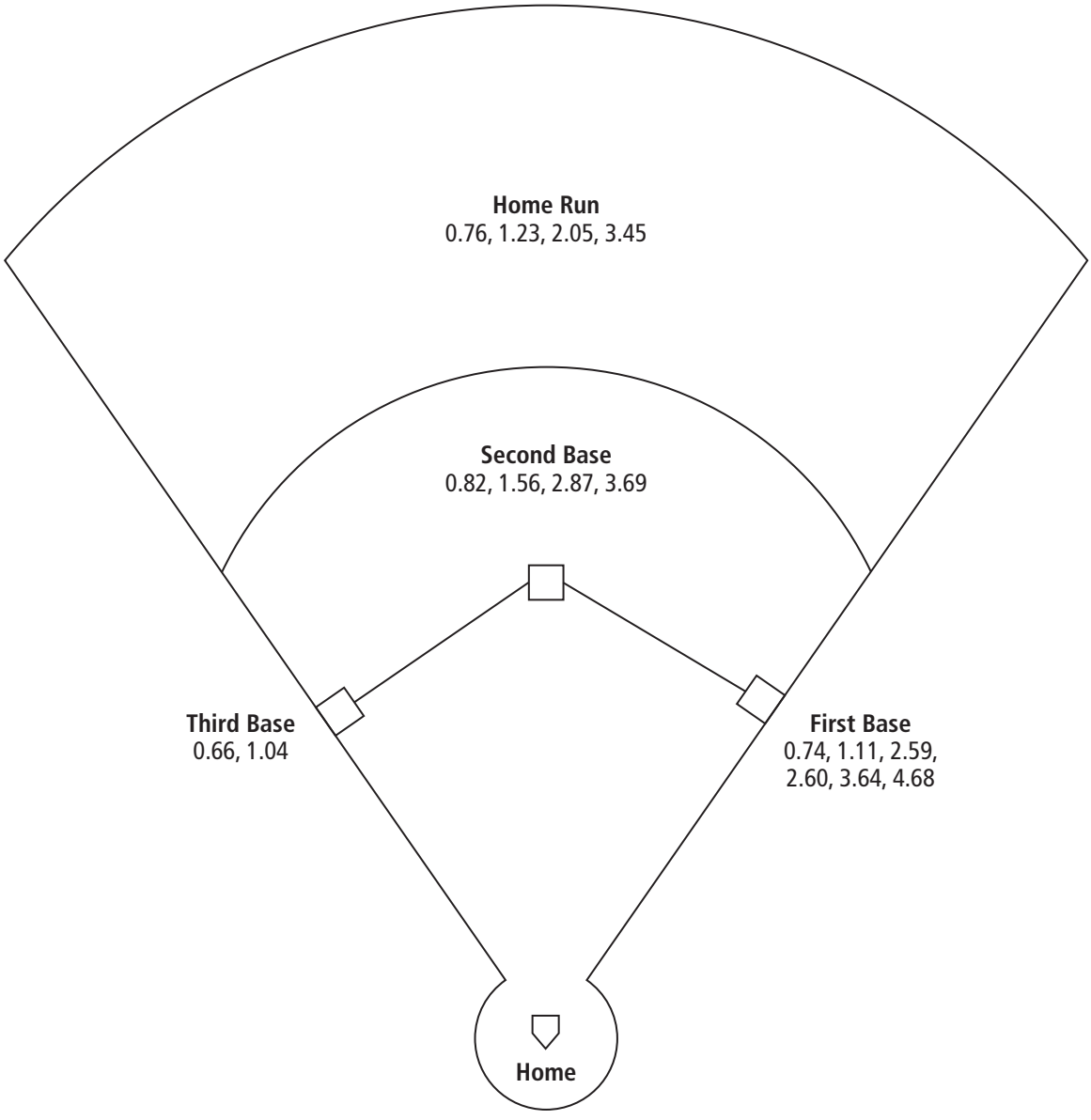
Use the scoreboard below to keep score and the field on the next page to move your players. Play ball! **Check students' work.**

Inning	1	2	3	4	5	6	7
Team 1							
Team 2							

Name _____ Class _____ Date _____

1-7 Game: Algebra Baseball

The Distributive Property



Name _____ Class _____ Date _____

1-8 Puzzle: Algebra Connections

An Introduction to Equations

Determine whether the given number is a solution to the equation. Show your work below each problem or on a separate piece of paper.

If the given number is a solution, then circle the problem number in the maze below. For example, you would circle "1" in the maze if 11 is a solution to $-3u + 5 = 28$. Follow the circled numbers as a guide to find the correct path through the maze!

1. $-3u + 5 = 28; 11$ **false**

2. $4.5 - 0.9y = 2.7; 2$ **true**

3. $9m - (-7) = 61; 6$ **true**

4. $\frac{1}{4}z + 7 = 11; 1$ **false**

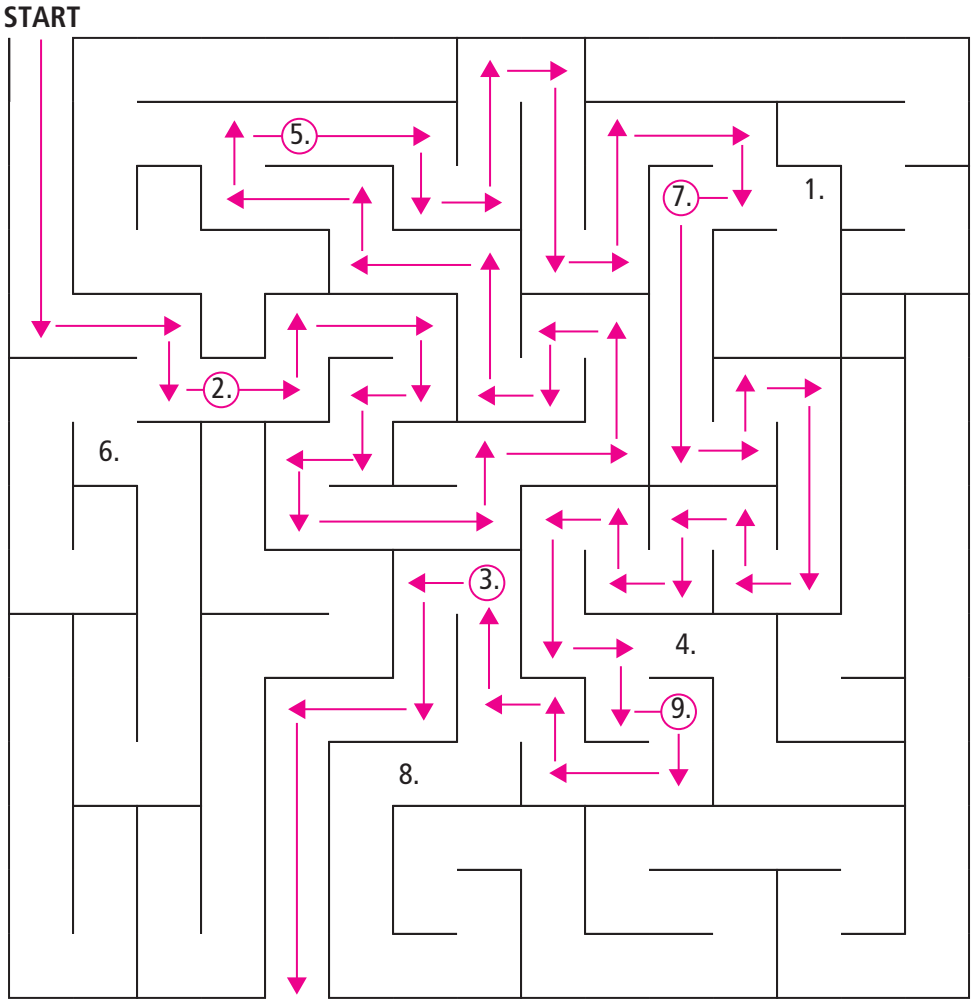
5. $10b - (-5) = 75; 7$ **true**

6. $7x - 5 = 33; 4$ **false**

7. $5k + 1 = 16; 3$ **true**

8. $7r - (-35) = 42; -1$ **false**

9. $\frac{3}{8}t + 2 = 5; 8$ **true**



Name _____ Class _____ Date _____

1-9 Activity: Sequencing Patterns

Patterns, Equations, and Graphs

This is an activity for you and a classmate. You may wish to discuss your results as a class when everyone has finished. An equation can be used to generate a list of numbers. Depending on the type of equation, you may also be able to see a pattern.

1. Consider $y = 3x + 1$. What do you get for y when $x = 1$? $x = 2$? Complete the table below by finding y for each given value of x.

x	1	2	3	4	5	6
$y = 3x + 1$						

2. Now look at the differences between the entries in your table. What pattern do you see?

The difference is always 3.

3. Based on the pattern, can you determine the y value when $x = 7$? $x = 8$? (Do not use the equation to evaluate.)

22 and 25

4. Consider $y = -4x + 5$. What do you get for a y value when $x = 1$? $x = 2$? Complete the table below by finding y for each given value of x.

x	1	2	3	4	5	6
$y = -4x + 5$						

5. Look at the differences between the entries in your table. What pattern do you see?

The difference is always −4.

6. Consider a more general equation of the form $y = ax + b$ where a and b are constants. What is y when $x = 1$?

a* + *b

7. Based on what you have seen, what can you do with y when $x = 1$ to find y when $x = 2$, $x = 3$, and so on?

You can add *a* to *a* + *b* to get *y* = 2*a* + *b* when *a* = 2.