Name _____ Date _____ Class _____

LESSON 1-2

Puzzles, Twisters & Teasers

Riddle Me This

What did the cucumber say to the vinegar?

To find out, choose the correct algebraic expression for each word phrase. Then find the letter associated with each expression you wrote to complete the decoder below.

1. 8 more than twice n

$8 - 2n$	**T**	$8n + 2$	**U**
$2n - 8$	**V**	$8 + 2n$	**P**

2. 3 less than the product of 4 and n

$3 - 4n$	**F**	$3n - 4$	**G**
$4n - 3$	**K**	$4n + 3$	**L**

3. 9 more than the product of 6 and n

$9 - 6n$	**F**	$6n + 9$	**E**
$9n + 6$	**D**	$6n - 9$	**G**

4. 3 more than the quotient of 4 and n

$\frac{4}{n} + 3$	**C**	$\frac{n}{4} + 3$	**D**
$\frac{(n + 3)}{4}$	**E**	$\frac{n}{3} + 4$	**F**

5. 1 divided by the sum of 2 and n

$\frac{1}{2} + n$	**J**	$\frac{(n + 1)}{2}$	**K**
$\frac{1}{n} + 2$	**L**	$\frac{1}{(2 + n)}$	**I**

6. 5 less than n divided by 6

$\frac{n}{6} - 5$	**L**	$\frac{n}{5} - 6$	**Q**
$5 - \frac{n}{6}$	**M**	$6 - \frac{n}{5}$	**U**

7. $\frac{1}{3}$ of the sum of 9 and n

$9 + \frac{n}{3}$	**M**	$\frac{1}{3}(9) + n$	**O**
$\frac{1}{3}(n + 9)$	**N**	$\frac{1}{3} + 9n$	**I**

8. 12 times the sum of 8 and n

$12(8) + n$	**S**	$12(n - 8)$	**T**
$12(n + 8)$	**R**	$12n + 8$	**U**

9. half the sum of n and 20

$\frac{1}{2}(20n)$	**B**	$\frac{1}{2} + 20n$	**L**
$\frac{(n + 20)}{2}$	**A**	$\frac{n}{2} + 20$	**R**

10. twice the quotient of n and 10

$2(\frac{n}{10})$	**W**	$2n + 10$	**M**
$2n - 10$	**N**	$2 + \frac{n}{10}$	**O**

____	____		____	____	____	____	____
10	**3**		**9**	**8**	**3**	**5**	**7**

____		____	____	____	____	____	____.
9		**1**	**5**	**4**	**2**	**6**	**3**

LESSON 1-2

Challenge

Amazing Math

Write an algebraic expression for each word phrase on the board. Evaluate each expression for $x = 2$.

Then find a path from the top row to the bottom row that gives a total of 22.

3 times x $3x = 6$	1 less than twice x $2x - 1 = 3$	6 more than x $x + 6 = 8$	x increased by 3 $x + 3 = 5$	the quotient of twice x and 2 $\frac{2x}{2} = 2$
1 more than x $x + 1 = 3$	the product of 3 and x $3x = 6$	x decreased by 1 $x - 1 = 1$	half of x $\frac{x}{2} = 1$	twice x increased by 3 $2x + 3 = 7$
1 less than 3 times x $3x - 1 = 5$	the difference between 3 and x $3 - x = 1$	the difference between 2 and x $2 - x = 0$	the product of 4 and x $4x = 8$	the sum of 6 and twice x $6 + 2x = 10$
twice x $2x = 4$	the difference between x and 1 $x - 1 = 1$	the sum of x and 5 $x + 5 = 7$	1 more than half of x $\frac{x}{2} + 1 = 2$	the product of 4 and 3 times x $4(3x) = 24$
x increased by 2 $x + 2 = 4$ 22	the quotient of x and 2 $\frac{x}{2} = 1$	7 increased by x $7 + x = 9$	the quotient of 6 and x $\frac{6}{x} = 3$	5 times x divided by 2 $\frac{5x}{2} = 5$

LESSON 1-2

Problem Solving

Writing Algebraic Expressions

Write the correct answer.

1. Morton bought 15 new books to add to his collection of books b. Write an algebraic expression to evaluate the total number of books in Morton's collection if he had 20 books in his collection.

   $15 + b$; 35 books

2. Paul exercises m minutes per day 5 days a week. Write an algebraic expression to evaluate how many minutes Paul exercises each week if he exercises 45 minutes per day.

   $5m$; 225 minutes

3. Helen bought 3 shirts that each cost s dollars. Write an algebraic expression to evaluate how much Helen spent in all if each shirt cost $22.

   $3s$; \$66

4. Claire makes b bracelets to divide evenly among four friends and herself. Write an algebraic expression to evaluate the number of bracelets each person will receive if Claire makes 15 bracelets.

   $\frac{b}{5}$; 3 bracelets

Choose the letter for the best answer.

5. Jonas collects baseball cards. He has 245 cards in his collection. For his birthday, he received r more cards, then he gave his brother g cards. Which algebraic expression represents the total number of cards he now has in his collection?
   - **A** $245 + r + g$
   - **B** $245 - r - g$
   - **C** $245 + r - g$
   - **D** $r + g - 245$

6. Monique is saving money for a computer. She has m dollars saved. For her birthday, her dad doubled her money, but then she spent s dollars on a shirt. Which algebraic expression represents the amount of money she has now saved for her computer?
   - **F** $m + 2 - s$
   - **G** $2m - s$
   - **H** $2m + s$
   - **J** $m + 2s$

7. Which algebraic expression represents the number of years in m months?
   - **A** $12m$
   - **B** $\frac{m}{12}$
   - **C** $12 + m$
   - **D** $12 - m$

8. Which algebraic expression represents how many minutes are in h hours?
   - **F** $60h$
   - **G** $\frac{h}{60}$
   - **H** $h + 60$
   - **J** $h - 60$

LESSON 1-2

Reading Strategies

Multiple-Meaning Phrases

Identifying word phrases for different operations can help you write algebraic expressions. Use this table for four operations.

Addition	Subtraction	Multiplication	Division
$m + 10$	$z - 5$	$2y$	$a \div 2$
a number plus 10	a number minus 5	2 times a number	a number divided by 2
add 10 to a number	subtract 5 from a number	2 multiplied by a number	one-half of a number
the sum of a number and 10	5 less than a number	twice a number	the quotient of a number with a divisor of 2
10 more than a number	a number decreased by 5	the product of 2 and a number	

The order of values and variables is very important when you are evaluating expressions with subtraction or division.

"5 less than a number" means $z - 5$, **not** $5 - z$.
"A number divided by 6" means $a \div 6$, **not** $6 \div a$.

Write a word phrase for each algebraic expression.

1. $7w$ — seven times a number
2. $h - 12$ — 12 less than a number
3. $t \div 6$ — a number divided by 6
4. $3(p + 8)$ — 3 times the sum of a number and 8

Write an algebraic expression for each word phrase.

5. a number z decreased by 4 — $z - 4$
6. 4 times the sum of n and 9 — $4(n + 9)$
7. the quotient of a number r with a divisor of 7 — $r \div 7$
8. a number n increased by 32 — $n + 32$

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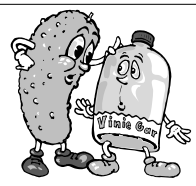

1. 8 more than twice n
   - $8 - 2n$ **T**
   - $8n + 2$ **U**
   - $2n - 8$ **V**
   - $8 + 2n$ (P)

2. 3 less than the product of 4 and n
   - $3 - 4n$ **F**
   - $3n - 4$ **G**
   - $4n - 3$ (K)
   - $4n + 3$ **L**

3. 9 more than the product of 6 and n
   - $9 - 6n$ **F**
   - $6n + 9$ (E)
   - $9n + 6$ **D**
   - $6n - 9$ **G**

4. 3 more than the quotient of 4 and n
   - $\frac{4}{n} + 3$ (C)
   - $\frac{n}{4} + 3$ **D**
   - $\frac{(n + 3)}{4}$ **E**
   - $\frac{n}{3} + 4$ **F**

5. 1 divided by the sum of 2 and n
   - $\frac{1}{2} + n$ **J**
   - $\frac{(n + 1)}{2}$ **K**
   - $\frac{1}{n} + 2$ **L**
   - $\frac{1}{(2 + n)}$ (I)

6. 5 less than n divided by 6
   - $\frac{n}{6} - 5$ (L)
   - $\frac{n}{5} - 6$ **Q**
   - $5 - \frac{n}{6}$ **M**
   - $6 - \frac{n}{5}$ **U**

7. $\frac{1}{3}$ of the sum of 9 and n
   - $9 + \frac{n}{3}$ **M**
   - $\frac{1}{3}(9) + n$ **O**
   - $\frac{1}{3}(n + 9)$ (N)
   - $\frac{1}{3} + 9n$ **I**

8. 12 times the sum of 8 and n
   - $12(8) + n$ **S**
   - $12(n - 8)$ **T**
   - $12(n + 8)$ (R)
   - $12n + 8$ **U**

9. half the sum of n and 20
   - $\frac{1}{2}(20n)$ **B**
   - $\frac{1}{2} + 20n$ **L**
   - $\frac{(n + 20)}{2}$ (A)
   - $\frac{n}{2} + 20$ **R**

10. twice the quotient of n and 10
    - $2(\frac{n}{10})$ (W)
    - $2n + 10$ **M**
    - $2n - 10$ **N**
    - $2 + \frac{n}{10}$ **O**

W	e		a	r	e		i	n
10	3		9	8	3		5	7

a		p	i	c	k	l	e	.
9		1	5	4	2	6	3	