Name _____ *A Key* _____   Period: _____

Lesson 1: Writing Expressions

A **variable** is any letter that represents an unknown number.

A **numerical expression** has numbers and operations.

A **variable expression** also has variables.

It is sometimes called an *algebraic expression*.

EXAMPLE 1 Here are some numerical expressions.

Words	Symbols
four times ten	$4 \cdot 10 \quad 4 \times 10 \quad 4(10)$
the sum of two and five	$2 + 5 \quad (2 + 5)$
nine divided by the difference of six and one	$9 \div (6 - 1) \quad \dfrac{9}{6 - 1}$

> **HINT**
> Notice in the examples shown here that some operations can be represented by more than one symbol.

EXAMPLE 2 Here are some variable expressions.

Words	Symbols
the product of seven and n	$7 \cdot n \quad 7 \times n \quad 7(n)$
a minus b plus four	$a - b + 4$
the quotient of a number and two	$x \div 2 \quad \dfrac{x}{2}$

Practice: First Try

Write symbols for the given words.

1. the sum of eight and six

   $8 + 6$

2. twenty divided by five

   $20 \div 5 \quad \dfrac{20}{5}$

3. the product of x and y

   $x \cdot y$

4. two times a number

   $2n \quad 2(n) \quad 2 \cdot n$

5. five times three

   $5 \cdot 3 \quad 5(3)$

6. the sum of nine and two divided by 7

   $(9 + 2) \div 7 \quad \dfrac{9 + 2}{7}$

7. 8 times the sum of b and 3

   $8(b + 3)$

8. 6 divided by the difference of x and 1

   $6 \div (x - 1) \quad \dfrac{6}{x - 1}$

9. the difference of nine and five

   $n - 5$

10. the product of ten and forty

    $10(40) \quad 10 \cdot 40$

Name **A Key**

Writing Expressions

Write the phrase as an expression.

1. 12 more than x ___$x+12$___
2. x less than 36 ___$36-x$___
3. one-third of a ___$\frac{a}{3}$ $a \div 3$___
4. 17 times s ___$17s$ $17(s)$ $17 \cdot s$___
5. b multiplied by 5 ___$5b$ $5 \cdot b$ $5(b)$___
6. y to the fourth power ___y^4___
7. 64 plus k ___$64+k$___
8. u tripled ___$3u$ $3 \cdot u$ $3(u)$___
9. p cubed ___p^3___
10. 18 minus x ___$18-x$___
11. 4 less than k ___$k-4$___
12. z increased by 12 ___$z+12$___

Write an expression to answer each question.

13. What is the product of 82 and g? ___$82g$ $82 \cdot g$ $82(g)$___

14. What is the difference between n and 7? ___$n-7$___

15. What is the quotient of 32 and x? ___$32 \div x$ $\frac{32}{x}$___

16. What is the sum of h and 7? ___$h+7$___

17. What is 31 less than c? ___$c-31$___

18. What is the fifth power of t? ___t^5___

19. What is one-eighth of r? ___$\frac{1}{8} \cdot r$ $r \div 8$ $\frac{r}{8}$___

20. Carolyn made t batches of 12 cookies. How many cookies did she make? ___$12t$___

21. A jar holds n ounces of jam. How many jars are needed for 200 ounces of jam? ___$200 \div n$ $\frac{200}{n}$___

Write the problem as an expression.

22. **History** Thomas Jefferson was born in 1801. George Washington was born y years earlier. In what year was George Washington born? ___$1801-y$___

23. **Science** A spider has 8 legs. How many legs do s spiders have? ___$8s$ $8 \cdot s$ $8(s)$___

26