

Variables and Expressions (Pages 6–11)

Letters such as x and y in a mathematical expression are called **variables**. Variables are symbols that are used to represent unspecified numbers. Any letter may be used as a variable. An **algebraic expression** consists of one or more numbers and variables along with one or more arithmetic operations. In multiplication expressions, the quantities being multiplied are called **factors**, and the result is the **product**. An expression such as x^y is called a **power**. The variable x is the **base** and y is called the **exponent**. The exponent indicates the number of times the base is used as a factor.

EXAMPLES

Verbal Expression	Algebraic Expression
2 less than the product of 5 and a number y	$5y - 2$
the product of 4 and a divided by the product of 3 and b	$4a \div 3b$
nine feet shorter than the height of the tree (T = tree height)	$T - 9$
one-third as costly as a first-class ticket (f = price of first class ticket)	$\frac{f}{3}$

Symbols	Words	Meaning
3^1	3 to the first power	3
3^2	3 to the second power or 3 squared	$3 \cdot 3$
3^5	3 to the fifth power	$3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$
$4s^3$	4 times s to the third power or 4 times s cubed	$4 \cdot s \cdot s \cdot s$

PRACTICE

Write an algebraic expression for each verbal expression.

- the sum of g and 14
- 10 less than the square of n
- K to the fifth power
- the product of 6 and r increased by one third of q
- the product of 12 and y
- 3 years younger than her sister (s = sister's age)

Write a verbal expression for each algebraic expression.

- $x^3 - 5$
- 6^4
- $\frac{n^2}{7}$
- $2(p + 4)$

Write each expression as an expression with exponents.

- $5 \cdot 5$
- $9 \cdot 9 \cdot 9 \cdot 9$
- $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
- $n \cdot n \cdot n$



- 15. Standardized Test Practice** Evaluate $2^4 + 5^3$.

- A** 14 **B** 23 **C** 141 **D** 7^7

Answers: 1. $g + 14$ 2. $n^2 - 10$ 3. K^5 4. $6r + \frac{3}{1}q$ 5. $12y$ 6. $s - 3$ 7. 5 less than the cube of x 8. 6 to the fourth power 9. n squared divided by 7 10. twice the sum of p and 4 11. 5^2 12. 9^4 13. 2^5 14. n^3 15. C