1-1 Variables and Expressions *(Pages 6–9)*

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 time 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)	$\dfrac{f}{3}$

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.

1. the sum of g and 14

2. 10 less than the square of n

3. K to the fifth power

4. the product of 6 and r increased by one third of q

5. the product of 12 and y

6. 3 years younger than her sister (s = sister's age)

Write a verbal expression for each algebraic expression.

7. $x^3 - 5$ **8.** 6^4 **9.** $\dfrac{n^2}{7}$ **10.** $2(p + 4)$

Write each expression as an expression with exponents.

11. $5 \cdot 5$ **12.** $9 \cdot 9 \cdot 9 \cdot 9$ **13.** $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$ **14.** $n \cdot n \cdot n$

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.** $6r + \frac{1}{3}q$ **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