Algebra Vocabulary

Algebra is a subject that has a vocabulary all its own, one that must be learned in order to understand and master algebraic concepts. In Algebra vocabulary, an **expression** is a grouping of numbers, symbols, variables, and operators that show the value of something. Here are examples of some expressions:

89	$\sqrt{16}$	72/9	y - 5(2z + 1)
4x - 7	5 + 5	3^6	8b + 6c - 20

By contrast, an **equation** is a statement of the equality of two expressions formulated by applying to a set of terms the algebraic operations as shown. Equations contain an equal sign with an expression on each side. Here are examples of some equations:

4f = 98 2 + 5 = 7 3 x 3 = 9 6x + 2y = 4z - 1

Within expressions and equations, there are terms, variables, operators, and symbols that provide information about how to evaluate an expression or solve an equation. To **evaluate** means to find the value of a given expression when the variable is replaced by a given number. Replacing a variable in an expression with a given number is called **substitution**. To **simplify** an expression means to reduce to its simplest form by combining like terms, performing operations, etc. Here are some other definitions:

variable - letter that represents a number
EX: xy, d, s

coefficient - number by which variable is to be multiplied
EX: **9**g, **11**b, **64**k

constant - a positive or negative number in an expression
EX: 735, -12, 4

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operator - a symbol that tells which mathematical operation to perform
EX: +, -, /, x, etc.

term - a single mathematical expression that might be:

a) a single positive or negative number
EX: -56, 24, 1,993

b) a single variable or several variables multiplied together with and without coefficients
EX: y, abc, 8d, -3xyz

Terms come together via addition to form expressions. For example, -8x and -7 will come together to form -8x - 7 and 5c and 2 will form 5c + 2. If there is NOT a negative sign in front of a coefficient or constant inside of an expression it is presumed positive.

Since terms are brought together through addition, when identifying terms in expressions, the subtraction sign in front of a constant or coefficient denotes that the term is negative. For example, the separate terms in the expression 4b - 12 are 4b and -12 and the terms in 9x - 3y - 6 are 9x, -3y, and -6.

like terms - terms whose variables, such as x or y, with any exponents, such as the 2 in x^2, are the same

EX: 7x and 2x are like terms because they are both "x".

$3x^2$ and $-2x^2$ are like terms because they are both "x^2".

But 7x and $7x^2$ are NOT like terms because the exponents are different, so they are unlike terms. To be considered like terms, the coefficients can be different but the variables AND exponents must be exactly the same.

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Constants, which are just positive and negative numbers, are like terms.

Like Terms	Unlike Terms
$3x + 7x$	$2x + 5y$
y^2x^2	$xyz - y^2x^2$
$3a + 4a$	$xy - p^2q^2$
$a^2b^2 - 4a^2b^2$	$mn + a^2x^2$
$2p + 9p$	$2m + 7n$
$k - 8k$	$3p + 7x$
$5c + 8c$	$4k + 7r$

Look at the terms in the chart above. Can you tell why they are considered like or unlike? Hint: If a variable does not show a coefficient, the coefficient is presumed to be 1 or -1.

EX: the coefficient of r is presumed to be 1
the coefficient of -g is presumed to be -1

Like terms can be added or subtracted but unlike terms cannot be. Adding or subtracting like terms to simplify is called **combining like terms**.

Combining Like Terms

$4x + 3x = 7x$

Add/Subtract the coefficients

The variable part stays the same

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Match the Algebra vocabulary words with their definitions by writing the correct small letter for each in the box.

a) combining like terms b) expression c) equation d) term
e) evaluate f) variable g) coefficient h) constant
i) operator j) like terms k) simplify l) substitution

1) to find the value of a given expression when the variable is replaced by a given number

2) number by which variable is to be multiplied

3) a single mathematical expression

4) a grouping of numbers, symbols, variables, and operators that show the value of something

5) letter that represents a number

6) a symbol that tells which mathematical operation to perform

7) a statement of the equality of two expressions formulated by applying to a set of terms the algebraic operations as shown

8) a positive or negative number in an expression

9) replacing a variable in an expression with a given number

10) terms whose variable and exponents are the same

11) reduce an expression to its simplest form by combining like terms, performing operations, etc.

12) adding or subtracting like terms to simplify

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