Algebra: Simplifying Expressions

Vocabulary

Term	A single number <u>or</u> the product of a number and one or more variables raised to whole number powers. Addition and subtraction signs break an expression into terms. $6x^2 - 5x + 7$ Examples: $6x^2$ is a term. $-5x$ is a term. 7 is a term.
Constant	A number that **does not change** its value; 7 is called a constant term.
Numerical Coefficient	A number **preceding** the variable in each term. It is understood to be 1 if none appears.

Consider the algebraic expression: $6x^2 + 4x - 7 + x^2 - 2y + 4 + 5x - 3y$

In this expression, there are 8 different terms. Each term has a coefficient or constant term.

Term	Coefficient	Term	Coefficient	Term	Coefficient	Term	Coefficient
$6x^2$	6	$4x$	4	-7	-7	x^2	1 (understood)

Term	Coefficient	Term	Constant	Term	Coefficient	Term	Coefficient
$-2y$	-2	4	4	$5x$	5	$-3y$	-3

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Like Terms	Two terms are considered to be like terms if they have the **same variables** with the **same exponents**. $4x$ and $5x$ are like terms. $6x^2$ and $4x$ are not.

Therefore, to evaluate the algebraic expression $6x^2 + 4x - 7 + x^2 - 2y + 4 + 5x - 3y$ by combining like terms:

1. Combine $6x^2$ and x^2 to get $7x^2$
2. Combine $4x$ and $5x$ to get $9x$
3. Combine $-2y$ and $-3y$ to get $-5y$
4. Combine -7 and 4 to get -3
5. Write down the final answer for the expression: $7x^2 + 9x - 5y - 3$

TRY: Combine like terms in the following: $5x^2 - 3x + 8 + 2x^2 + 5x - 6$

Sometimes one must use the distributive property before combining like terms.

$3(x^2 + 8) - 2(x^2 - 5)$ Use the Distributive Property

$3x^2 + 24 - 2x^2 + 10$ Did you distribute the – with the -5 to get +10?
                    This is one of the most COMMON ERRORS! Be very careful.

$x^2 + 34$ Like terms combined.

TRY: Combine like terms in the following: $-4(x + 3y) + 5(2x - y)$