



## Terms in Expressions

### i. Definition and Explanation

An algebraic expression is a mathematical phrase that can contain ordinary numbers, variables (like  $x$  or  $y$ ), and operators (like add, subtract, multiply, and divide). A term is a single part of an algebraic expression. Terms are the "building blocks" that are separated by addition (+) or subtraction (–) signs.

**Key Idea:** Think of the + and – signs as separators that divide the expression into individual terms. The sign to the left of a number or variable is part of that term.

**Example:** In the expression  $4x + 7 - 2y$

- The separators are + and –.
- The individual terms are:  $4x$ ,  $+7$ , and  $-2y$ . We usually just write the positive term as 7.

### ii. Key Points and Important Terms

To fully understand terms, you need to know their components:

**Variable:** A letter or symbol that represents an unknown number.

**Examples:**  $x$ ,  $a$ ,  $n$

**Coefficient:** The number that is multiplied by a variable. It's written in front of the variable.

**Example:** In the term  $5y$ , the coefficient is 5.

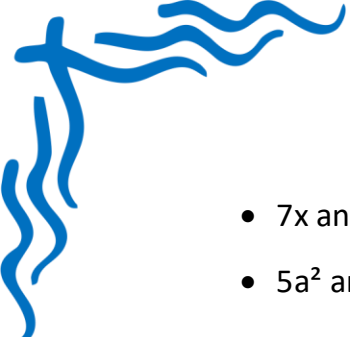
- **Important:** If a variable stands alone, like  $x$ , its coefficient is 1 (because  $x$  is the same as  $1x$ ).
- **Important:** If a variable has a negative sign, like  $-a$ , its coefficient is  $-1$  (because  $-a$  is the same as  $-1a$ ).

**Constant:** A term that is just a number without any variable attached. Its value never changes.

**Example:** In the expression  $2x + 8$ , the constant is 8.

**Like Terms:** Terms that have the exact same variable(s) raised to the exact same power(s). The coefficients can be different. Constants are also like terms with each other.

**Examples of like terms:**

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- $7x$  and  $-2x$  (both have the variable  $x$ )
  - $5a^2$  and  $a^2$  (both have the variable  $a^2$ )
  - $9$  and  $-4$  (both are constants)

**Unlike Terms:** Terms that do not have the same variable or the same power.

**Examples of unlike terms:**

- $3x$  and  $3y$  (different variables)
- $4n$  and  $6$  (one has a variable, one is a constant)
- $5x$  and  $5x^2$  (same variable, but different powers/exponents)

### iii. Detailed Examples with Solutions

Let's break down some expressions to identify their parts.

**Example 1:**  $5x - 3y + 8$

**Terms:** There are three terms. Remember to include the sign!

- $5x$
- $-3y$
- $8$

**Coefficients:** Look for numbers in front of variables.

- The coefficient of  $x$  is  $5$ .
- The coefficient of  $y$  is  $-3$ .

**Variables:**

- $x$
- $y$

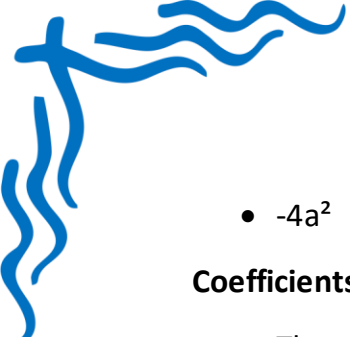
**Constant:** The number by itself.

- $8$

**Example 2:**  $a^2 + b - 7 - 4a^2$

Terms:

- $a^2$
- $b$
- $-7$

- 
- $-4a^2$

**Coefficients:**

- The coefficient of  $a^2$  is 1.
- The coefficient of  $b$  is 1.
- The coefficient of the other  $a^2$  term is -4.

**Constant:**

- -7

**Like Terms:**

- $a^2$  and  $-4a^2$  are like terms.
- $b$  is by itself (an unlike term to the others).
- -7 is a constant.

#### iv. Summary of Main Concepts

- **Expression:** A mathematical phrase with numbers, variables, and operators.
- **Term:** A single part of an expression, separated by + or – signs. The sign is part of the term.
- **Coefficient:** The number multiplied by a variable (e.g., in  $-6x$ , the coefficient is -6).
- **Constant:** A number on its own, with no variable.
- **Variable:** A letter representing an unknown value.
- **Like Terms:** Terms with the exact same variable and exponent. They can be combined (added or subtracted).
- **Unlike Terms:** Terms that cannot be combined because their variable parts are different.