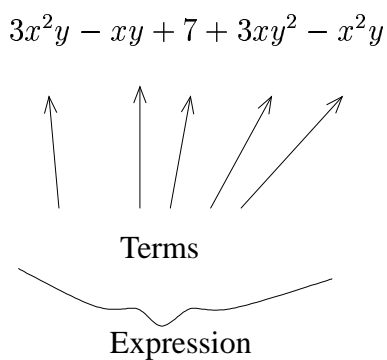# 1.5A   Terms and Expressions

A.   Definitions

1. **Terms**: things separated by plus/minus signs

2. **Expressions**: collection of terms; **doesn't** have an equals sign

$$3x^2y - xy + 7 + 3xy^2 - x^2y$$

Terms

Expression

3. **Coefficient**: number in front of term: $\boxed{3}\, x^2y$

   Note: "no number" in front means the coefficient is 1

B.   Important Viewpoint

Suppose we have an expression like $3x^2 - xy + 4xy^2 - 4y^2$.

Think of the plus/minus signs as "belonging" to the next term.

Thus, we think of the expression as being formed by a combination of

"$3x^2$"   and   "$-xy$"   and   "$4xy^2$"   and   "$-4y^2$"

C. Comments on Order

1. The variables in a term can be written in any order (by commutativity).

   Thus x^2y and yx^2 are the same.

2. The terms in an expression can be written in any order (by commutativity).

   Thus $3x^2 - y$ and $-y + 3x^2$ are the same.

D. Collecting Like Terms

Method:

1. Alphabetize each term

2. Add/subtract the like terms (terms that have the same form)

Example 1:   Simplify $3a^2b - 4b^2a + 2ba^2 - 5ab^2$

Solution

First alphabetize: $3a^2b - 4ab^2 + 2a^2b - 5ab^2$

Identify like terms to combine: $\underline{3a^2b}\ \underline{\underline{-4ab^2}}\ \underline{+2a^2b}\ \underline{\underline{-5ab^2}}$

Ans $\boxed{5a^2b - 9ab^2}$

Example 2:   Simplify $6ab - 4cb - ab^2 - ba^2c + 3bc + ab^2c - 2cba^2$

Solution

First alphabetize: $6ab - 4bc - ab^2 - a^2bc + 3bc + ab^2c - 2a^2bc$

Identify like terms to combine: $6ab \underline{-4bc} - ab^2 \underline{\underline{-a^2bc}} \underline{+3bc} + ab^2c \underline{\underline{-2a^2bc}}$

Ans $\boxed{6ab - bc - ab^2 - 3a^2bc + ab^2c}$