Algebraic Expressions - Summary

1. Introduction

- Algebraic expressions consist of **constants** (fixed values) and **variables** (unknown numbers that can change).
- They use operations like **addition, subtraction, multiplication, and division**.

2. Components of an Algebraic Expression

- **Term:** A single mathematical entity (e.g., `3x` , `-5y²`).
- **Coefficient:** The numerical part of a term (e.g., in `5xy` , the coefficient is `5`).
- **Like Terms:** Terms with the same variables and powers (e.g., `3xy` and `-7xy`).
- **Unlike Terms:** Terms with different variables or powers (e.g., `5x²` and `3x`).

3. Types of Algebraic Expressions

- **Monomial:** Single term (e.g., `7x²`).
- **Binomial:** Two terms (e.g., `5x - 3`).
- **Trinomial:** Three terms (e.g., `x² - 2x + 5`).
- **Polynomial:** More than one term (general category).

4. Operations on Algebraic Expressions

- **Addition:** Add like terms only (`3x + 5x = 8x`).
- **Subtraction:** Subtract like terms (`7x - 2x = 5x`).
- **Multiplication:** Multiply terms (`2x × 3y = 6xy`).
- **Division:** Divide terms (`6xy ÷ 3y = 2x`).

5. Degree of an Expression

- The highest exponent of the variable in a term.
  - Example: `x² + 3x + 7` has a **degree of 2**.

6. Finding the Value of an Expression

- Substitute the given values into the expression.
  - Example: Find value of `2x + 3y` when `x = 2` , `y = 3`
    → `2(2) + 3(3) = 4 + 9 = 13` .

7. Important Properties

- **Distributive Law:** $a(b + c) = ab + ac$
- **Commutative Law:** $a + b = b + a$ and $ab = ba$
- **Associative Law:** $(a + b) + c = a + (b + c)$

Quick Revision Points

✅ **Terms** = Separated by $+$ or $-$
✅ **Like Terms** = Same variable, same power
✅ **Addition/Subtraction** = Combine like terms only
✅ **Multiplication** = Multiply coefficients and variables
✅ **Degree** = Highest exponent in the expression
✅ **Value of Expression** = Substitute given values