

## Mathematics - Algebra Chapter

### Introduction:

Algebra is a branch of mathematics dealing with symbols and the rules for manipulating those symbols.

It helps in representing problems or situations in the form of mathematical expressions and equations.

### Key Concepts:

1. Variables: Symbols like  $x$ ,  $y$ ,  $z$  that represent unknown numbers.
2. Constants: Fixed numbers like 2, 5, -3.
3. Expressions: Combination of variables and constants using operations. Example:  $2x + 3$ .
4. Equations: A statement that two expressions are equal. Example:  $2x + 3 = 7$ .

### Examples:

1. Solve for  $x$ :  $2x + 3 = 7$

$$\Rightarrow 2x = 7 - 3$$

$$\Rightarrow 2x = 4$$

$$\Rightarrow x = 2$$

2. If  $x = 5$ , evaluate:  $3x^2 + 2x + 1$

$$\Rightarrow 3(25) + 10 + 1 = 75 + 10 + 1 = 86$$

### Practice Questions:

1. Solve for  $y$ :  $5y - 4 = 11$
2. If  $a = 3$ , evaluate:  $a^2 + 2a + 5$

3. Simplify:  $2(x + 3) + 4x$

4. Solve:  $x/2 + 7 = 10$

Summary:

Algebra helps us generalize arithmetic operations and solve real-life problems using symbols and equations.