

Basic Algebra Lessons

Lesson 1: Introduction to Algebra

Algebra is a branch of mathematics that uses symbols (usually letters) to represent numbers. These symbols are called variables. For example, in the equation $x + 5 = 10$, x is a variable.

Key Concepts:

- Variables: Symbols representing unknown values.
- Constants: Fixed numbers (e.g., 2, 5, 10).
- Expressions: Combinations of variables, constants, and operations (e.g., $2x + 3$).
- Equations: Statements that two expressions are equal (e.g., $2x + 3 = 7$).

Lesson 2: Simplifying Expressions

Simplifying means reducing an expression to its simplest form.

Example:

$$2x + 3x = 5x$$

Here, ' $2x$ ' and ' $3x$ ' are like terms, and they can be added together.

Steps:

1. Combine like terms.
2. Apply arithmetic rules (addition, subtraction, multiplication, division).

Lesson 3: Solving Equations

To solve an equation means to find the value of the variable that makes the equation true.

Example:

$$x + 5 = 10$$

Subtract 5 from both sides: $x = 10 - 5$

So, $x = 5$.

Steps:

1. Simplify both sides if needed.
2. Use inverse operations to isolate the variable.
3. Check your solution by substituting it back.

Lesson 4: Word Problems

Word problems use real-life situations that can be expressed as algebraic equations.

Example:

A number increased by 7 is 12. What is the number?

Let the number be x .

$$\text{Equation: } x + 7 = 12$$

Solve: $x = 12 - 7 = 5$.

Answer: The number is 5.