

CBSE Class 6 Maths Notes Chapter 11: In CBSE Class 6 Maths, Chapter 11, "Algebra," students learn the fundamentals of algebraic expressions and equations. It teaches how to express unknown numbers with variables, which are letters like x and y . This is useful for creating equations that help solve issues. The idea of expressions with variables and constants is covered in this chapter, along with how generalising patterns and rules can be done with them.

Students gain knowledge on how to solve basic equations and simplify expressions. In addition, CBSE Class 6 Maths Notes Chapter 11 emphasises how algebra may be used in everyday situations to solve word problems and identify missing values, which lays a solid foundation for further mathematical study.

CBSE Class 6 Maths Notes Chapter 11 Overview

CBSE Class 6 Maths Notes Chapter 11, is a crucial subject that exposes students to the basic ideas of algebra. In order to solve mathematical problems and generalise patterns, it helps pupils grasp how to express unknown values using variables, or letters. Students' ability to formulate and simplify algebraic formulas fosters their capacity for critical thought and problem-solving. Since algebra is utilised extensively in many disciplines, including science, economics, and engineering, this chapter will be crucial to your future academic and professional endeavours.

CBSE Class 6 Maths Notes Chapter 11 also establishes the foundation for more complex algebraic ideas that will be covered in later classes. Algebra is a practical and helpful mathematical tool because it helps students apply it to real-life circumstances like calculating unknown values and answering word problems.

CBSE Class 6 Maths Notes Chapter 11 Algebra

Below is the CBSE Class 6 Maths Notes Chapter 11 Algebra -

In the mathematical field of algebra, letters can be used in place of numbers to find unknowns. Another way to phrase it is the process of creating equations with real-world variables and then solving them. The Arabic term "al-jabr," which signifies the mending of fractured pieces, is where the word algebra originates. Here are some practice algebraic problems for your kids.

Introduction to Algebra

Variable

A variable is an unknown quantity that is prone to change with the context of a situation.
Example: In the expression $2x+5$, x is the variable.

Constant

Constant is a quantity which has a fixed value. In the given example $2x+5$, 5 is the constant.

Terms of an Expression

Terms are components of an equation that are initially constructed independently, then added or deleted.

The equation $(2x+5)$ is created by adding the terms $2x$ and 5 in the example above.

Factors of a Term

Terms are components of an equation that are initially constructed independently, then added or deleted.

Quantities that are not further factorisable are called factors of a phrase.

Factors of the phrase $2x$ in the example above are x and 2.

Coefficient of a Term

The numerical factor of a term is called the coefficient of the term.

In the above-given example, 2 is the coefficient of the term $2x$.

Like Terms and **Unlike Terms** are fundamental concepts in algebra, helping to simplify expressions.

Like Terms: These are terms that have the same variables raised to the same powers. The coefficients (numerical values) of the terms can be different, but the variable parts must be identical.

Example: $8xy$ and $3xy$ are like terms.

Unlike Terms: These are terms that have different variables or the same variables raised to different powers. Unlike terms cannot be combined through addition or subtraction.

Example: $7xy$ and $-3x$ are unlike terms.

Monomial, Binomial, Trinomial and Polynomial Terms

Name	Monomial	Binomial	Trinomial	Polynomial
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No. of terms	1	2	3	>3
Example	$7xy$	$(4x-3)$	$(3x+5y-6)$	$(6x+5yx-3y+4)$

Formation of Algebraic Expressions

Combinations of variables, constants and operators constitute an algebraic expression.

Example: $2x+3$, $3y+4xy$, etc.

Addition and Subtraction of Algebraic Expressions

Addition and Subtraction of Algebraic Expressions involve combining like terms, while unlike terms remain separate. Here's how it works:

Addition and Subtraction of Like Terms

Sum of two or more like terms is a like term.

Its numerical coefficient will be equal to the sum of the numerical coefficients of all the like terms.

Example: $8y+7y=?$

$$\begin{array}{r}
 8y \\
 +7y \\
 \hline
 (8+7)y = 15y
 \end{array}$$

Difference between two like terms is a like term.

Its numerical coefficient will be equal to the difference between the numerical coefficients of the two like terms.

Example: $11z-8z=?$

$$\begin{array}{r}
 11z \\
 -8z \\
 \hline
 (1-8)z = 3z
 \end{array}$$

Addition and Subtraction of Unlike Terms

- For adding or subtracting two or more algebraic expressions, like terms of both the expressions are grouped together and unlike terms are retained as it is.
- **Addition of $-5x^2+12xy$ and $7x^2+xy+7x$ is shown below:**

$$\begin{array}{r} -5x^2+12xy \\ 7x^2+xy+7x \\ \hline 2x^2+13xy+7x \\ \hline \end{array}$$

- **Subtraction of $-5x^2+12xy$ and $7x^2+xy+7x$ is shown below:**

$$\begin{array}{r} -5x^2+12xy \\ -7x^2+xy+7x \\ \hline 12x^2+11xy-7x \\ \hline \end{array}$$

Algebra as Patterns

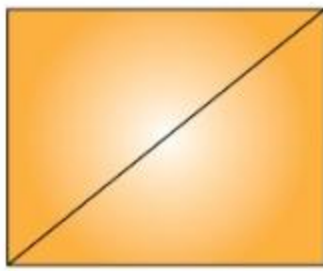
Algebra as Patterns refers to the use of algebra to identify, represent, and generalize patterns found in numbers, shapes, and real-life scenarios. Algebra allows students to express patterns using variables, making it easier to predict future terms and find general rules.

Number Patterns

- If a natural number is denoted by n , then its successor is $(n + 1)$.
Example: Successor of $n=10$ is $n+1=11$.
- If a natural number is denoted by n , then $2n$ is an even number and $(2n+1)$ is an odd number.
Example: If $n=10$, then $2n=20$ is an even number and $2n+1=21$ is an odd number.

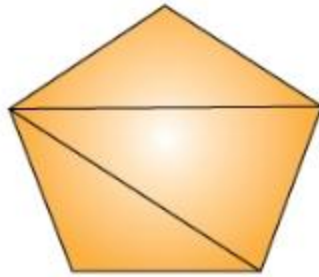
Patterns in Geometry

There are geometric figures that exhibit patterns that algebraic equations can depict. An algebraic expression that represents the number of diagonals that can be drawn from a single vertex of a polygon with n sides is $(n - 3)$.



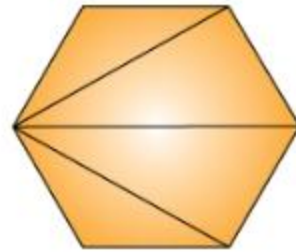
Square

$(n-3)-(4-3)-1$ diagonal
from one vertex



Pentagon

$(n-3)-(5-3)-2$ diagonals
from one vertex



Hexagon

$(n-3)-(6-3)-3$ diagonals
from one vertex

Geometric shapes and their diagonals

Algebraic Expressions in Perimeter and Area Formulae

- Algebraic expressions can be used in formulating perimeter of figures.

Example: Let L be the length of one side then, the perimeter of :

1. An equilateral triangle = $3L$.
2. A square = $4L$.
3. A regular pentagon = $5L$.

- Algebraic expressions can be used in formulating area of figures.

Example: Area of :

1. Square = l^2 where l is the side length of the square.
2. Rectangle = $l * b$, where l and b are lengths and breadth of the rectangle.
3. Triangle = $\frac{1}{2} b * h$ where b and h are base and height of the triangle.

What Is the Equation?

A condition on a variable that can only be satisfied for a certain value of the variable is called an equation.

An equality sign divides an equation's left-hand side (LHS) from its right-hand side (RHS). LHS therefore equals RHS.

It is not an equation if LHS and RHS are not equal.

Solving an Equation

A variable's value that makes an equation work is referred to as its solution.

Using the trial and error method is one of the easiest ways to solve an equation.

Benefits of CBSE Class 6 Maths Notes Chapter 11

The benefits of studying Chapter 11, Algebra, in CBSE Class 6 Maths include:

Foundation for Advanced Mathematics: Algebra forms the basis for higher-level mathematics, helping students build a strong foundation for future topics such as equations, functions, and calculus.

Problem-Solving Skills: It enhances logical thinking and analytical abilities as students learn to solve complex problems by using variables and simplifying expressions.

Generalization of Patterns: Algebra teaches students to recognize and generalize patterns, which is useful in solving real-world problems efficiently.

Real-Life Application: It helps students understand and solve practical problems, such as calculating unknown values in daily life scenarios, making it a versatile tool.

Improved Critical Thinking: The chapter encourages critical thinking and helps in developing a structured approach to problem-solving.

Boosts Confidence: Mastery of algebraic concepts builds confidence in dealing with more abstract mathematical concepts later.