CBSE Class 6 Maths Chapter 11 Algebra Notes

Algebra is a branch of mathematics that can substitute letters for numbers to find the unknown. It can also be defined as putting real-life variables into equations and then solving them. The word Algebra is derived from Arabic "al-jabr", which means the reunion of broken parts. Below are some algebra problems for students to practice.

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

Parts of an expression which are formed separately first and then added or subtracted, are known as terms.

In the above-given example, terms 2x and 5 are added to form the expression (2x+5).

Factors of a term

Parts of an expression which are formed separately first and then added or subtracted, are known as terms.

- Factors of a term are quantities which cannot be further factorised.
- In the above-given example, factors of the term 2x are 2 and x.

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 and Unlike Terms

Like terms

Terms having the same variables are called like terms.>

Example: 8xy and 3xy are like terms.

Unlike terms

Terms having different variables are called, unlike terms.

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

Monomial, Binomial, Trinomial and Polynomial Terms

Name	Monomial	Binomial	Trinomial	Polynomial
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 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=?

8y

+7y

(8+7)y = 15y

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=?

11z

−8z

_____

(1-8)z = 3z

_____

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 they are.
- **Addition of −5x2+12xy and 7x2+xy+7x is shown below:**

−5x2+12xy

7x2+xy+7x

_____

2x2+13xy+7x

_____

- **Subtraction of −5x2+12xy and 7x2+xy+7x is shown below:**

−5x2+12xy

−7x2+xy+7x

_____

12x2+11xy−7x

_____

Algebra as Patterns

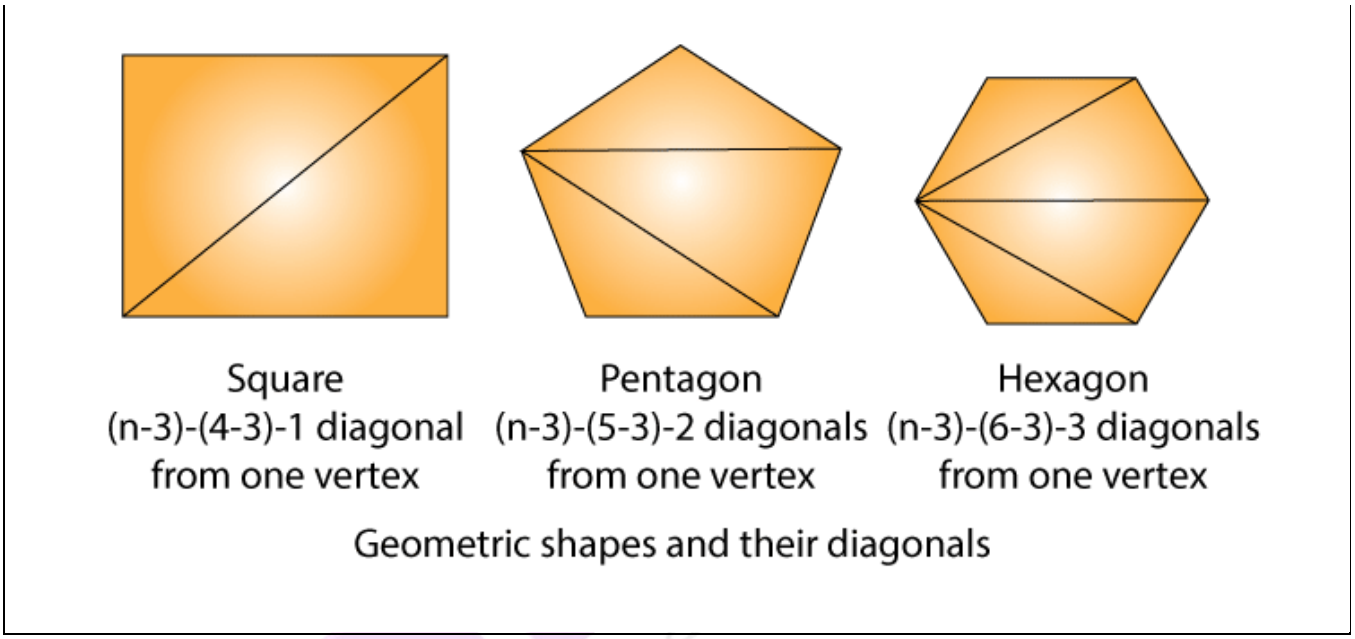
Number patterns

- 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

- Some geometrical figures follow patterns which can be represented by algebraic expressions. Example: Number of diagonals we can draw from one vertex of a polygon of n sides is (n – 3) which is an algebraic expression.



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 = l2 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 = 1/2 b * h where b and h are base and height of the triangle.

What is the Equation?

An equation is a condition on a variable which is satisfied only for a definite value of the variable.

- The left-hand side(LHS) and right-hand side(RHS) of an equation are separated by an equality sign. Hence LHS = RHS.
- If LHS is not equal to RHS, then it is not an equation.

Solving an Equation

Value of a variable in an equation which satisfies the equation is called its solution.

- One of the simplest methods of finding the solution of an equation is the trial and error method.