## **Algebraic Expressions**

## NOTES

## **FUNDAMENTALS**

- Algebra: It is a branch of mathematics in which we use literal numbers and statements symbolically. Literal numbers can be positive or negative. They are Variables.
- Variable: A symbol which takes various values is known as a variable. Normally it is denoted by x, y, z etc.
- Coefficient: Symbols like a, b, 1, m etc.., are used to denote the coefficients. Coefficients that are numbers are called numerical coefficients.
- Algebraic expression: A combination of constants and variables connected by some or all of the four fundamental operations +, -, × and ÷ is called an algebraic expression.

e.g., -5x + 6 is an algebraic expression.

Here -5 is the coefficient of the variable 'x' and 6 is the constant.

• Like and unlike terms: In a given algebraic expression, the terms having the same literal factors are called like or similar terms, otherwise they are called unlike terms.

e.g., 8xy and -4xy are like terms while 6xy and 6x are unlike terms,

• Factors: Each term of an algebraic expression consists of a constant or product of constant and variables.

## • Various types of algebraic expression:

(a) Monomial: An algebraic expression which contains only one term, is called as monomial.

Thus, 2x, 3y, 5xy,  $6ab^2$ , -11 etc. are called monomials.

(b) Binomial: An algebraic expression containing two terms is called a binomial.

Thus, (2a + 6b), (8-6x),  $(x^2 - 6xy^2)$ , etc., are all binomials.

(c) Trinomial: An algebraic expression containing three terms is called a trinomial.

Thus, (a+2b+5c), (x+2y-3z),  $(x^3+y^3+z^3)$ , etc., are all trinomials.

- (d) Polynomial: An expression containing two or more terms is called a polynomial.
- Addition of Algebraic Expression: While adding algebraic expressions, we collect the like terms and add them. The sum of several like terms is another like term whose coefficient is the sum of the coefficients of those like terms. The like terms are added and the unlike terms are left as they are. e.g.,

$$7x + 2y + 8x + 3x^2 + 5x^2 + 6y^2$$

$$= (7+8)x + 2y + (3+5)x^{2} + 6y^{2}$$

• Subtraction of Algebraic Expression>: The difference of two like terms is a like term whose coefficients is the difference of the numerical coefficients of the two like terms.

e.g.,  $7x^2 - 8x^2 = (7 - 8)x^2 = -x^2$ , 8y - 6y - 2y = (8 - 6 - 2)y = 0y = 0

• Value of an algebraic expression: The value of an algebraic expression depends on the values of the variables forming the expression.

• Using algebraic expressions - Formulae and Rules: Rules and formulae in mathematics are written in a concise and general form using algebraic expression.

Thus, the area of square  $= a^2$ , where a is the length of side of a square.

The general  $(n^{th})$  term of a number pattern (or a sequence) is an expression in 'n'.

Thus, the nth term of the number pattern 9, 19, 22, 39......is (10n-1)