

MATHS

Algebra

1. The main feature of algebra is the use of letters, which allow us to write rules and formulae in general way.
2. In algebra, letters are used to represent unknown or unspecified numbers. These letters are called variables. The word 'variable' means something that can vary/change.
3. Use of variables in geometry:
 - i. Perimeter of a square: $p = 4l$, where l is the length of a side of the square and p is the perimeter of square
 - ii. Perimeter of a rectangle: $p = 2(l + b)$, where l and b respectively are the length and breadth of rectangle and p is the perimeter of rectangle
4. Use of variables in arithmetic:
 - i. Commutativity of addition of two numbers:
Let a and b be any two variables. The commutative property of addition of numbers can be expressed as $a + b = b + a$.
 - ii. Commutativity of multiplication of two numbers:
Let a and b be any two variables. The commutative property of multiplication of numbers can be expressed as $a \times b = b \times a$.
 - iii. Distributivity of numbers:
Let a , b and c be any three variables. The distributive property of multiplication over addition of numbers can be expressed as $a \times (b + c) = a \times b + a \times c$.
5. Variables can take different values, they have no fixed values. But they are numbers. So, as in the case of numbers, operations of addition, subtraction, multiplication and division can be done on them.
6. Any numeral, variable or combination of numeral and variable connected by one or more symbols '+', '-', is known as an algebraic expression.
7. An algebraic expression consists of two parts: Numerical factor and Literal factor.
For example, In the algebraic expression $4x$, we have 4 as the numerical factor and x the literal factor
8. Types of algebraic expressions:

Monomials: Expressions with single term are called monomials.
Example: $-6x^2y$, $5abc^2$

Binomials: Expressions with two terms are called binomials.
Example: $-5a+2b$, $6x^2y-2ab$

Polynomials: Expressions with one or more terms are called polynomials.
Example: $ab + bc + ca + a^2$
9. The terms having the same literal factors are called like terms; otherwise they are called unlike terms.
10. An equation is an equality between two algebraic expressions. For example, $3x + 7 = 9$
11. In a simple linear equation there is one and only one variable and also its power is 1.
12. The LHS of an equation is equal to its RHS only for a definite value of the variable in the equation. We say that this definite value is the solution of the given equation.
13. Solution of an equation can be calculated by using trial and error method.