

Linear Equation in one Variable

NOTES

FUNDAMENTALS

- Variable: A symbol which takes various values is known as a variable. Normally it is denoted by letters x, y etc.
- Constant: A symbol having a fixed numerical value is called a constant.
Symbols used to denote a constant are generally, 'c', 'k' etc...
- Coefficient: In the product of a variable and a constant, each is called the coefficient of the other. Sometimes, symbols like a, b, 1, m etc..., are used to denote the coefficients.
- Expression: An expression can be defined as a combination of constant, variables and coefficients by some or all of the four fundamental mathematical operations (+, −, × and ÷).
e.g., $2x - 6$; here, 2 is the coefficient of 'x'; 'x' is the variable and -6 is the constant. Similarly in $ay + b$; a is the coefficient of y; 'y' is the variable and $(+b)$ is the constant.
- Equation: A statement of equality of two algebraic expression involving a variable is called an equation.
- Simple linear equation: An equation which contains only one variable of degree 1 is called a simple linear equation.
e.g., (i) $5x - 1 = 6x + m$ (ii) $3(x - 4) = 5$
(iii) $2y + 5 = \frac{y}{6} - 2$ (iv) $\frac{t-1}{6} + \frac{2t}{7} = a$
- Solution of an equation: That value of the variable, which when substituted in the given equation, makes the two sides L.H.S. (Left Hand Side) and R.H.S. (Right hand sided) of the equation equal is called the solution or root of that equation.
e.g., $2x + 6 = 3x - 10 \Rightarrow 6 + 10 = 3x - 2x \Rightarrow 16 = x$
Verification
Substituting $x = 16$ we have LHS = $2 \times 16 + 6 = 38$ & RHS = $3 \times 16 - 10 = 38$
 $\therefore x = 16$ is a solution of the above equation.
- Rules for solving an equation
 - Same number can be added to both sides of an equation.
 - Same number can be subtracted from both sides of an equal.
 - Both sides of an equation can be multiplied by the same non - zero number
 - Both sides of an equation can be divided by the same non - zero number
 - Cross multiplication: If $\frac{ax+b}{cx+d} = \frac{p}{q}$, then $q(ax+b) = p(cx+d)$.

This process is called cross multiplication.