

Linear Equations in One Variable

Algebraic Equation

An algebraic equation is an equality involving variables. It says that the value of the expression on one side of the equality sign is equal to the value of the expression on the other side.

What is Linear equation in one Variable

We will restrict the above equation with two conditions

or

An equation of the form $ax + b = 0$, where a and b are real numbers, such that a is not equal to zero, is called a linear equation in one variables

Important points to Note

S.no	Points
1	These all equation contains the equality (=) sign.
2	The expression on the left of the equality sign is the Left Hand Side (LHS). The expression on the right of the equality sign is the Right Hand Side (RHS)
3	In an equation the values of the expressions on the LHS and RHS are equal. This happens to be true only for certain values of the variable. These values are the solutions of the equation
4	We assume that the two sides of the equation are balanced. We perform the same mathematical operations on both sides of the equation, so that the balance is not disturbed. We get the solution after generally performing few steps
5	A linear equation in one variable has only one solution

How to solve Linear equation in one variable

S.no	Type of method	Working of method
1	Solving Equations which have Linear Expressions on one Side and Numbers on the other Side	1) Transpose (changing the side of the number) the Numbers to the side where all number are present. We know the sign of the number changes when we transpose it to other side 2) Now you will have an equation have variable on one side and number on other side. Add/subtract on both the side to get single term 3) Now divide or multiply on both the side to get the value of the variable
2	Solving Equations having the Variable on both Sides	1) Here we Transpose (changing the side of the number) both the variable and Numbers to the side so that one side contains only the number and other side contains only the variable. We know the sign of the number changes when we transpose it to other side. Same is the case with Variable 2) Now you will have an equation have variable on one side and number on other side. Add/subtract on both the side to get single term 3) Now divide or multiply on both the side to get the value of the variable

3	Solving Complex Equations (having number in denominator) having the Variable on both Sides	1) Take the LCM of the denominator of both the LHS and RHS 2) Multiple the LCM on both the sides, this will reduce the number without denominator and we can solve using the method described above
4	Equations Reducible to the Linear Form	Here the equation is of the form $\frac{x+a}{x+b} = \frac{c}{d}$ We can cross multiply the numerator and denominator to reduce it to linear for $(x+a)d=c(x+b)$ Now it can be solved by above method