

Maths Class 10 Notes for Quadratic Equations

QUADRATIC EQUATIONS

The polynomial of degree two is called quadratic polynomial and equation corresponding to a quadratic polynomial $P(x)$ is called a quadratic equation in variable x .

Thus, $P(x) = ax^2 + bx + c = 0$, $a \neq 0$, $a, b, c \in \mathbb{R}$ is known as the standard form of quadratic equation.

There are two types of quadratic equation.

- (i) **Complete quadratic equation** : The equation $ax^2 + bx + c = 0$ where $a \neq 0$, $b \neq 0$, $c \neq 0$
- (ii) **Pure quadratic equation** : An equation in the form of $ax^2 = 0$, $a \neq 0$, $b = 0$, $c = 0$

ZERO OF A QUADRATIC POLYNOMIAL

The value of x for which the polynomial becomes zero is called zero of a polynomial

For instance,

1 is zero of the polynomial $x^2 - 2x + 1$ because it becomes zero at $x = 1$.

SOLUTION OF A QUADRATIC EQUATION BY

FACTORISATION

A real number x is called a root of the quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ if $ax^2 + bx + c = 0$. In this case, we say $x = \alpha$ is a solution of the quadratic equation.

NOTE:

1. The zeroes of the quadratic polynomial $ax^2 + bx + c$ and the roots of the quadratic equation $ax^2 + bx + c = 0$ are the same.
2. Roots of quadratic equation $ax^2 + bx + c = 0$ can be found by factorizing it into two linear factors and equating each factor to zero.

SOLUTION OF A QUADRATIC EQUATION BY COMPLETING THE SQUARE

By adding and subtracting a suitable constant, we club the x^2 and x terms in the quadratic equation so that they become complete square, and solve for x .

In fact, we can convert any quadratic equation to the form $(x + a)^2 - b^2 = 0$ and then we can easily find its roots.

DISCRIMINANT