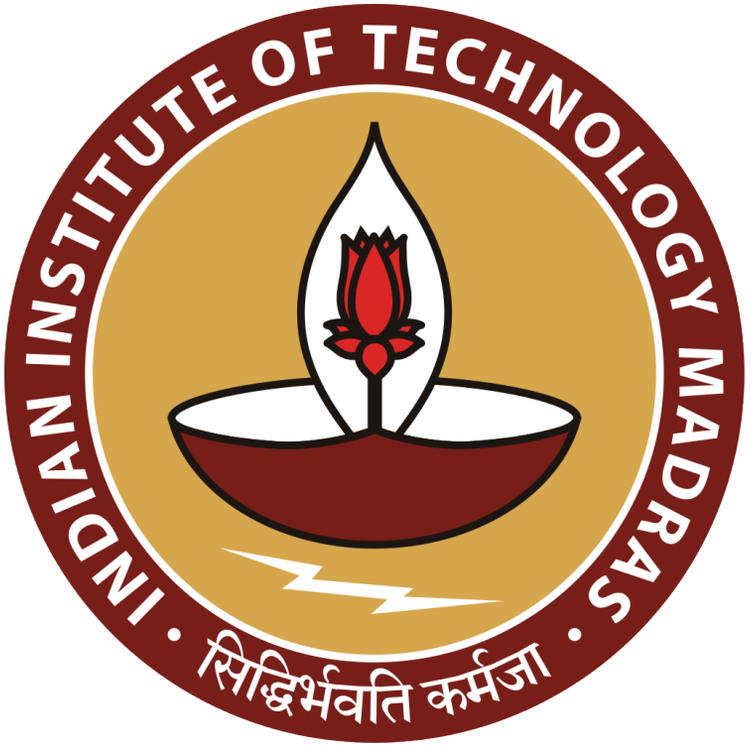


IIT Madras

ONLINE DEGREE

Quadratic Equations

Solve by Graphing

Quadratic Equation (Definition)

If a quadratic function is set equal to a value, then the result is a quadratic equation.

Eg. $ax^2+bx+c=0$, and $ax^2+bx+c=5$, where $a\neq0$ are quadratic equations.

If $ax^2+bx+c=0$, with $a\neq0$, and a,b,c are integers, then the quadratic equation is said to be in *the standard form*.

Roots of Equations and Zeros of Functions

The solutions to a quadratic equation are called *roots of the equation*.

One method for finding the roots of a quadratic equation is to find zeros of a related quadratic function.

Observe that the zeros of a function are x-intercepts of its graph and these are the solutions of related equation as f(x)=0 at these points.

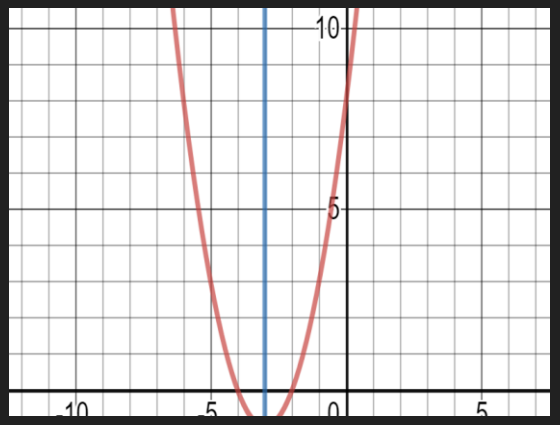
Examples

Find the roots of the following equations.

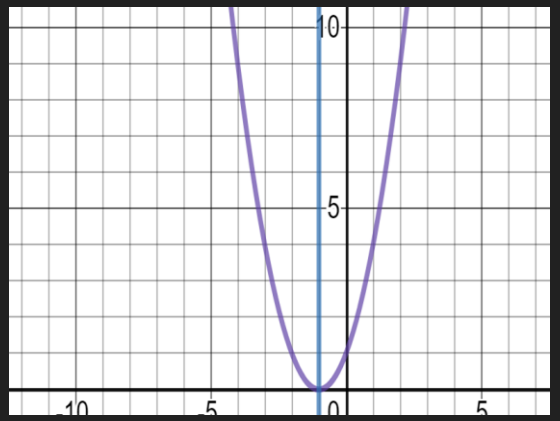
1. $x^2+6x+8=0$.
2. $x^2+2x+1=0$.
3. $x^2+1=0$.

Graph the related quadratic functions using axis of symmetry and vertex.

Axis of symmetry:$x=-3$
The roots are -4,-2,
Two real roots.



Axis of symmetry:$x=-1$
The roots are -1, -1
One real root.



Axis of symmetry:$x=0$
No real roots.