Quadratic Formula

$$If \ ax^2 + bx + c = 0, \ a \neq 0,$$

$$\Rightarrow \ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$Discriminant = \Delta = b^2 - 4ac$$

Case	Nature of its roots
$\Delta > 0$	• There are two distinct real roots to the equation, $ax^2 + bx + c = 0$. $$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-b \pm \sqrt{\Delta}}{2a}$$
$\Delta = 0$	• There is one repeated real solution to the equation, $ax^2 + bx + c = 0$. $$x = \frac{-b}{2a}$$
$\Delta < 0$	• There are two distinct complex solutions, to the equation, $ax^2 + bx + c = 0$ which are complex conjugates of each other. $$x = \frac{-b \pm i\sqrt{4ac - b^2}}{2a} = \frac{-b \pm i\sqrt{-\Delta}}{2a}$$