

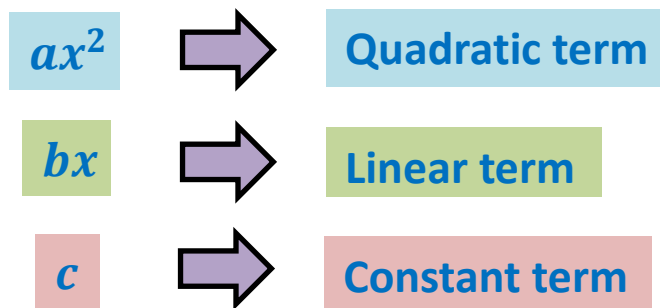
Completing the Square

 Guided Notes

A **quadratic equation** is of the form:

$$ax^2 + bx + c = 0$$

Where, $a \neq 0$.




A **trinomial equation** is an equation having three terms or monomials on one side of the equation. The other side of the equation can be zero or a non-zero constant. It is written as:

$$ax^2 + bx + c = d$$

Where, $a \neq 0$.

Completing Squares

This method is used when finding the solution of quadratic equations using square roots. If one side of the equation (having the trinomial) is not a perfect square, we can make it a perfect square by adding a suitable constant number on both sides of the equation.

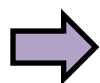

$$x^2 + bx + \left(\frac{b}{2}\right)^2 = \left(x + \frac{b}{2}\right)^2$$

Note that the term being added is the square of half the coefficient of linear term i.e. ***b*** in ***x***.

Completing the Square Guided Notes

Problem 1: What is the value of b such that $x^2 - 14x + b$ is a perfect square trinomial?

Here the coefficient of x is -14 .



$$b = \left(\frac{-14}{2}\right)^2$$



$$b = (-7)^2 = 49$$

So the perfect square trinomial is,



$$x^2 - 14x + 49$$

Problem 2: What are the solutions of the equation $x^2 + 2x = 35$?

Here the coefficient of x is 2 , so the term to add is $\left(\frac{2}{2}\right)^2 = 1$



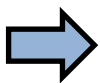
$$x^2 + 2x + 1 = 35 + 1$$



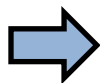
$$(x + 1)^2 = 36$$



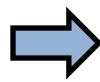
$$\sqrt{(x + 1)^2} = \sqrt{36}$$



$$x + 1 = 6$$



$$x = 5$$



$$x + 1 = -6$$



$$x = -7$$