

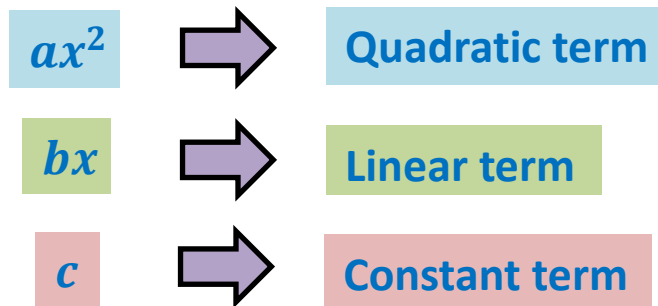
# Factoring to Solve Quadratic Equations

 Guided Notes

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

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

Where,  $a \neq 0$ .



## Zero-Product Property

This property is important when solving the quadratic equations.

If:

$$ab = 0 \quad \rightarrow \quad a = 0 \quad \text{or} \quad b = 0$$

**Problem 1:** What are the solutions of the quadratic equation  $y = (x + 2)(x - 3)$ ?

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## Solution by Factorization

In this method, the middle term of the quadratic equation  $ax^2 + bx + c = 0$  i.e.  $bx$  is re-written as a sum of two terms  $mx$  and  $nx$  such that:

$$\Rightarrow (\pm mx) + (\pm nx) = (\pm bx)$$

$$\Rightarrow (\pm mx) \times (\pm nx) = (\pm acx^2)$$

- The algebraic **sum** of two terms is equal to the middle term.
- The algebraic **product** of two terms is equal to the product of the quadratic term and the constant term.

After this, the equation can be simplified and written as  $(x \pm m)(x \pm n) = 0$  and zero product property can be applied to find the values of  $x$ .

**Problem 2:** Find the solution of the quadratic equation  $x^2 - x - 6$ .