Chapter 4

Quadratic Equation

INTRODUCTION

This section explores the fundamental principles of equations. the methods for solving quadratic equations were covered in earlier lessons. now, we will delve into the advanced applications of quadratic equations in a systematic manner.

POLYNOMIAL EQUATION

A mathematical expression in the format of

$$a_0x^n + a_1x^{n-1} + a_2x^{n-2} + a_3x^{n-3} + \cdots \ldots + a_{n-1}x + a_n = 0$$

where $a_0 \neq 0, a_1, a_2, a_3, \ldots \ldots, a_{n-1}, a_n$

A polynomial equation in a single variable x, characterized by constants a, b, c, etc., and where n is a positive integer, is denoted as a polynomial equation of nth degree.

Equation and identity

An equation represents the equality between two mathematical expressions, while an identity is a type of equation where two mathematical expressions are equal for all permissible values of their variables.

for instance, $x^2 - 5x + 6 = 0$ is a single-variable equation since it is fulfilled only by the specific values x = 2 and x = 3, but...

$$\frac{(x-a)(x-b)}{(c-a)(c-b)} + \frac{(x-b)(x-c)}{(a-b)(a-c)} + \frac{(x-c)(x-a)}{(b-c)(b-a)} = 1$$

Is an identity since it holds true for all real values of x.

The variable's value that satisfies the equation is referred to as the root of the equation. in the previous example, x = 2 and

x = 3 serve as roots of the equation. $x^2 - 5x + 6 = 0$