Introduction to Quadratic Equations

1. Standard Form

A quadratic equation is defined as:

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

where 'a', 'b', and 'c' are constants and a is not zero.

2. The Quadratic Formula

The solutions (roots) can be found using the formula:

```
x = (-b ± sqrt(b^2 - 4ac)) / 2a
```

3. The Discriminant (Delta)

The value inside the square root is called the discriminant:

```
Delta = b^2 - 4ac
```

- If Delta > 0: Two real distinct roots.
- If Delta = 0: One real repeated root.
- If Delta < 0: No real roots (complex roots).

4. Example Problem

Solve x^2 - 5x + 6 = 0

Here a=1, b=-5, c=6.

Discriminant = (-5)^2 - 4(1)(6) = 25 - 24 = 1

Roots = (5 ± 1) / 2

x1 = 3, x2 = 2