Mathematics: Quadratic Functions and Graphs

Introduction to Quadratic Functions

A quadratic function is a polynomial function of degree 2.

The general form is: $f(x) = ax^2 + bx + c$

Where a, b, and c are constants, and a â 0.

Key Features of Quadratic Functions:

1. Vertex: The highest or lowest point on the parabola

2. Axis of Symmetry: A vertical line that divides the parabola

3. Roots/Zeros: The x-intercepts where function equals zero

4. Y-intercept: The point where graph crosses y-axis

Solving Quadratic Equations:

1. Factoring: Express as product of two binomials

2. Quadratic Formula: $x = (-b ´– â (b^2 - 4ac)) / 2a$

3. Completing the Square: Transform to perfect square form

4. Graphing: Find x-intercepts on the graph

Real-World Applications:

1. Projectile Motion: Path of thrown object follows parabola

2. Optimization: Finding max/min values in business

3. Architecture: Designing arches and bridges

4. Economics: Modeling profit and cost functions

IMPORTANT: This PDF contains visual diagrams and graphs
that are essential for understanding quadratic functions.
The graphs show the parabolic shape, vertex points,
roots, and real-world applications like projectile motion.

Visual Content: This document includes mathematical graphs
and diagrams that help illustrate the concepts.
These visual aids are crucial for understanding the material.