Introduction to Quadratic Equations and Functions

Welcome to Quadratic Equations and Functions!

Quadratic equations and functions are a fundamental concept in mathematics, used to model real-world phenomena, such as the trajectory of a projectile, the growth of a population, and the design of electronic circuits.

In this worksheet, we will explore the basics of quadratic equations and functions, and provide you with interactive activities and questions to help you understand and apply these concepts.

What are Quadratic Equations and Functions?

A quadratic equation is a polynomial equation of degree two, which means the highest power of the variable is two. The general form of a quadratic equation is ax^2 + bx + c = 0, where a, b, and c are constants.

A quadratic function, on the other hand, is a function that can be represented by a quadratic equation.

Key Concepts

Here are some key concepts related to quadratic equations and functions:

1. **Vertex**: The lowest or highest point on the graph of a quadratic function.
2. **Axis of Symmetry**: The vertical line that passes through the vertex of a quadratic function.
3. **X-Intercepts**: The points where the graph of a quadratic function intersects the x-axis.

Quadratic Equation Scavenger Hunt

Find and solve quadratic equations in real-world scenarios, such as the trajectory of a projectile or the growth of a population.

Scenario	Quadratic Equation	Solution

Graphing Quadratic Functions

Graph quadratic functions and identify key features, such as the vertex, axis of symmetry, and x-intercepts.

Use the following graph to answer the questions:

[Graph]

1. What is the vertex of the graph?

2. What is the axis of symmetry of the graph?

3. What are the x-intercepts of the graph?

Quadratic Equation Solving

Solve quadratic equations using factoring, quadratic formula, and graphing.

Solve the following quadratic equation: x^2 + 4x + 4 = 0

Real-World Applications

Use quadratic equations to model real-world phenomena, such as the trajectory of a projectile or the growth of a population.

Choose one of the following scenarios and create a quadratic equation to model it:

1. Projectile Motion
2. Population Growth
3. Electronic Circuits

Challenge

Create a quadratic function that models a real-world scenario, such as the growth of a population or the trajectory of a projectile.

Graph the function and identify key features, such as the vertex, axis of symmetry, and x-intercepts.

[Graph]

Conclusion

Quadratic equations and functions are powerful tools used to model real-world phenomena.

By understanding and applying these concepts, you can solve complex problems and make informed decisions.

Individual Reflection:

1. What was the most surprising thing you learned today?
2. How will this learning change your actions in the future?
3. What questions do you still have about quadratic equations and functions?

Glossary

Here are some key terms related to quadratic equations and functions:

1. **Quadratic Equation**: A polynomial equation of degree two.
2. **Quadratic Function**: A function that can be represented by a quadratic equation.
3. **Vertex**: The lowest or highest point on the graph of a quadratic function.
4. **Axis of Symmetry**: The vertical line that passes through the vertex of a quadratic function.
5. **X-Intercepts**: The points where the graph of a quadratic function intersects the x-axis.