Solving Quadratic Equations by Factoring and Graphing

Introduction to Quadratic Equations

Read the introduction to quadratic equations and answer the following questions:

1. What is a quadratic equation?

2. What is the general form of a quadratic equation?

Factoring Quadratic Expressions

Factor the following quadratic expressions:

1. x^2 + 4x + 4

2. x^2 - 3x - 4

3. x^2 + 2x - 6

Solving Quadratic Equations by Factoring

Solve the following quadratic equations by factoring:

1. x^2 + 5x + 6 = 0
2. x^2 - 2x - 8 = 0
3. x^2 + x - 12 = 0

Graphing Quadratic Equations

Graph the following quadratic equations:

1. y = x^2 + 2x - 3
2. y = x^2 - 4x - 5
3. y = x^2 + x + 2

Extension Tasks for Advanced Learners

Complete the following extension tasks:

1. Solve the equation x^2 + 2x + 5 = 0, which has complex roots.
2. Graph the equation y = x^2 - 4x + 4, which has multiple solutions.
3. Create a quadratic equation that models a real-world situation, such as the trajectory of a projectile.

Assessment

Complete the following assessment tasks:

1. Multiple Choice Questions: Choose the correct answer for each question.
    - What is the factored form of x^2 + 5x + 6?
        - (x + 3)(x + 2)
        - (x + 2)(x + 3)
        - (x - 3)(x - 2)
    - What is the solution to the equation x^2 + 2x + 1 = 0?
        - x = -1
        - x = 1
        - x = -2
2. Short Answer Questions: Answer each question in complete sentences.
    - What is the difference between factoring and graphing a quadratic equation?
    - How do you solve a quadratic equation by factoring?

Conclusion

Summarize what you have learned about solving quadratic equations by factoring and graphing.

Extension

Complete the following extension tasks:

1. Research Project: Research and present on a topic related to quadratic equations, such as the history of quadratic equations or the application of quadratic equations in a specific field.
2. Math Project: Create a math project that involves solving quadratic equations, such as designing a roller coaster or a bridge.