Algebra 1  
Unit 8Lesson 3CC BY NC 2024 Illustrative Mathematics®

Unit 8, Lesson 3

# Solving Quadratic Equations by Reasoning

* Let’s find solutions to quadratic equations.

Algebra 1  
Unit 8Lesson 3CC BY NC 2024 Illustrative Mathematics®

## 3.1How Many Solutions?

How many solutions does each equation have? What are the solution(s)? Be prepared to explain how you know.

Algebra 1  
Unit 8Lesson 3CC BY NC 2024 Illustrative Mathematics®

## 3.2Finding Pairs of Solutions

Each of these equations has two solutions. What are they? Explain or show your reasoning.

### Are you ready for more?

1. How many solutions does the equation have? What are the solutions?
2. How many solutions does the equation have? What are the solutions?
3. Write a new equation that has 10 solutions.

## Lesson 3 Summary

Some quadratic equations can be solved by performing the same operation on each side of the equal sign and reasoning about which values for the variable would make the equation true.

Suppose we wanted to solve . We can proceed like this:

* Add 75 to each side:
* Divide each side by 3:
* What number can be squared to get 25?
* There are two numbers that work, 5 and -5:

 and

* If , then .
* If , then .

This means that both and make the equation true and are solutions to the equation.

Many quadratic equations have 2 solutions, but some have only 1 or no solution.