

Learning Targets

Quadratic Equations

Lesson 1: Finding Unknown Inputs

- I can explain the meaning of a solution to an equation in terms of a situation.
- I can write a quadratic equation that represents a situation.

Lesson 2: When and Why Do We Write Quadratic Equations?

- I can recognize the factored form of a quadratic expression and know when it can be useful for solving problems.
- I can use a graph to find the solutions to a quadratic equation but also know its limitations.

Lesson 3: Solving Quadratic Equations by Reasoning

- I can find solutions to quadratic equations by reasoning about the values that make the equation true.
- I know that quadratic equations may have two solutions.

Lesson 4: Solving Quadratic Equations with the Zero Product Property

- I can explain the meaning of the “zero product property.”
- I can find solutions to quadratic equations when one side is a product of factors and the other side is zero.

Lesson 5: How Many Solutions?

- I can explain why dividing by a variable to solve a quadratic equation is not a good strategy.
- I know that quadratic equations can have no solutions and can explain why there are none.

Lesson 6: Rewriting Quadratic Expressions in Factored Form (Part 1)

- I can explain how the numbers in a quadratic expression in factored form relate to the numbers in an equivalent expression in standard form.
- When given quadratic expressions in factored form, I can rewrite them in standard form.
- When given quadratic expressions in the form of $x^2 + bx + c$, I can rewrite them in factored form.

Lesson 7: Rewriting Quadratic Expressions in Factored Form (Part 2)

- I can explain how the numbers and signs in a quadratic expression in factored form relate to the numbers and signs in an equivalent expression in standard form.
- When given a quadratic expression given in standard form with a negative constant term, I can write an equivalent expression in factored form.

Lesson 8: Rewriting Quadratic Expressions in Factored Form (Part 3)

- I can explain why multiplying a sum and a difference, $(x + m)(x - m)$, results in a quadratic expression with no linear term.
- When given quadratic expressions in the form of $x^2 + bx + c$, I can rewrite them in factored form.

Lesson 9: Solving Quadratic Equations by Using Factored Form

- I can rearrange a quadratic equation to be written as expression in factored form = 0 and find the solutions.
- I can recognize quadratic equations that have 0, 1, or 2 solutions when they are written in factored form.

Lesson 10: Rewriting Quadratic Expressions in Factored Form (Part 4)

- I can use the factored form of a quadratic expression or a graph of a quadratic function to answer questions about a situation.
- When given quadratic expressions of the form $ax^2 + bx + c$ and a is not 1, I can write equivalent expressions in factored form.

Lesson 11: What are Perfect Squares?

- I can recognize perfect-square expressions written in different forms.
- I can recognize quadratic equations that have a perfect-square expression and solve the equations.

Lesson 12: Completing the Square (Part 1)

- I can explain what it means to “complete the square” and describe how to do it.
- I can solve quadratic equations by completing the square and finding square roots.

Lesson 13: Completing the Square (Part 2)

- When given a quadratic equation in which the coefficient of the squared term is 1, I can solve it by completing the square.

Lesson 14: Completing the Square (Part 3)

- I can complete the square for quadratic expressions of the form $ax^2 + bx + c$ when a is not 1 and explain the process.
- I can solve quadratic equations in which the squared term coefficient is not 1 by completing the square.

Lesson 15: Quadratic Equations with Irrational Solutions

- I can use the radical and “plus-minus” symbols to represent solutions to quadratic equations.
- I know why the plus-minus symbol is used when solving quadratic equations by finding square roots.

Lesson 16: The Quadratic Formula

- I can use the quadratic formula to solve quadratic equations.
- I know some methods for solving quadratic equations can be more convenient than others.

Lesson 17: Applying the Quadratic Formula (Part 1)

- I can use the quadratic formula to solve an equation and interpret the solutions in terms of a situation.

Lesson 18: Applying the Quadratic Formula (Part 2)

- I can identify common errors when using the quadratic formula.
- I know some ways to tell if a number is a solution to a quadratic equation.

Lesson 19: Deriving the Quadratic Formula

- I can explain the steps and complete some missing steps for deriving the quadratic formula.
- I know how the quadratic formula is related to the process of completing the square for a quadratic equation $ax^2 + bx + c = 0$.

Lesson 20: Rational and Irrational Solutions

- I can explain why adding a rational number and an irrational number produces an irrational number.
- I can explain why multiplying a rational number (except 0) and an irrational number produces an irrational number.
- I can explain why sums or products of two rational numbers are rational.

Lesson 21: Sums and Products of Rational and Irrational Numbers

- I can explain why adding a rational number and an irrational number produces an irrational number.
- I can explain why multiplying a rational number (except 0) and an irrational number produces an irrational number.
- I can explain why sums or products of two rational numbers are rational.

Lesson 22: Rewriting Quadratic Expressions in Vertex Form

- I can identify the vertex of the graph of a quadratic function when the expression that defines it is written in vertex form.
- I know the meaning of the term “vertex form” and can recognize examples of quadratic expressions written in this form.
- When given a quadratic expression in standard form, I can rewrite it in vertex form.

Lesson 23: Using Quadratic Expressions in Vertex Form to Solve Problems

- I can find the maximum or minimum of a function by writing the quadratic expression that defines it in vertex form.
- When given a quadratic function in vertex form, I can explain why the vertex is a maximum or minimum.

Lesson 24: Using Quadratic Equations to Model Situations and Solve Problems

- I can interpret information about a quadratic function given its equation or a graph.
- I can rewrite quadratic functions in different but equivalent forms of my choosing and use that form to solve problems.
- In situations modeled by quadratic functions, I can decide which form to use depending on the questions being asked.