

TOPIC 5

Solve Problems Using Equations and Inequalities

In this topic, students write and solve equations and inequalities to model real-world situations.

CONNECT THE MATH

Just as many real-world situations can be modeled by expressions, many real-world problems can be modeled by equations or inequalities. An *equation* is used to model a problem for which there is one solution. An *inequality* is used to model a problem for which there is more than one solution.

Suppose a bowling alley charges \$4.75 per game plus \$4.80 to rent shoes. The equation $4.75g + 4.8 = 28.55$ models the situation where g represents the number of games bowled and the total charge is \$28.55. There is only one solution, 5 games, to this equation. The inequality $4.75g + 4.8 < 30$ models the situation when the total budget must be less than \$30. There is more than one solution: you could bowl 1, 2, 3, 4, or 5 games. The cost for 6 or more games is more than \$30.





LESSON 5-1

Write Two-Step Equations

Equations with more than one operation can be used to represent a mathematical or real-world situation by relating variables, coefficients, and constants.

LESSON OBJECTIVES

- Analyze word problems to write two-step equations.
- Interpret the quantities in an equation.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Solve a Two-Step Equation?](#)
- [How Do You Turn a Verbal Phrase into a Two-Step Equation?](#)

You can use these search terms and phrases to help your student find additional help online:

- writing two-step equations in one variable

- interpreting the parts of a two-step equation in one variable



LESSON 5-2

Solve Two-Step Equations

One- and two-step problems can be represented by an equation. The equation can then be solved using properties of equality.

LESSON OBJECTIVES

- Solve problems using two-step equations.
- Compare algebraic and arithmetic solutions.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Solve a Two-Step Equation?](#)
- [How Do You Solve a Word Problem Using a Two-Step Equation?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [isolate the variable](#)

You can use these search terms and phrases to help your student find additional help online:

- modeling two-step equations in one variable
- solving two-step equations in one variable



LESSON 5-3

Solve Equations Using the Distributive Property

The Distributive Property can be used to solve equations in the form $p(x + q) = r$. These types of equations can be used to represent situations and solve problems.

LESSON OBJECTIVES

- Solve equations using the Distributive Property.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What's the Distributive Property?](#)
- [How Do You Solve a Two-Step Equation by Distributing a Fraction First?](#)

You can use these search terms and phrases to help your student find additional help online:

- solving equations by using the Distributive Property
 - distributing a negative number
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LESSON 5-4

Solve Inequalities Using Addition or Subtraction

Solving inequalities involving addition and subtraction is like solving equations. The inverse relationship between addition and subtraction is used to isolate the variable.

LESSON OBJECTIVES

- Graph the solutions of inequalities on a number line.
 - Solve inequalities using the Addition and Subtraction Properties of Inequality.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Use Subtraction to Solve an Inequality Word Problem?](#)
- [How Do You Use Addition to Solve an Inequality Word Problem?](#)

You can use these search terms and phrases to help your student find additional help online:

- solving inequalities in one variable with addition or subtraction
- graphing inequalities in one variable



LESSON 5-5

Solve Inequalities Using Multiplication or Division

Solving inequalities with multiplication and division is very similar to solving equations. In an inequality, when multiplying or dividing by a negative value, the inequality symbol is reversed.

LESSON OBJECTIVES

- Write inequalities and solve them using the Multiplication and Division Properties of Inequality.
 - Graph solutions of inequalities on a number line.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Use Multiplication with Positive Numbers to Solve an Inequality Word Problem?](#)
- [How Do You Use Multiplication with Negative Numbers to Solve an Inequality Word Problem?](#)

You can use these search terms and phrases to help your student find additional help online:

- solving inequalities in one variable by multiplying or dividing positive numbers
- solving inequalities in one variable by multiplying or dividing negative numbers



LESSON 5-6

Solve Two-Step Inequalities

To solve a two-step inequality, add or subtract the constant, and then multiply or divide to isolate the variable.

LESSON OBJECTIVES

- Solve an inequality by multiplying or dividing by a negative rational number.
- Write a two-step inequality to solve a problem.
- Solve a two-step inequality.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Solve a Two-Step Inequality?](#)
- [How Do You Solve a Decimal Inequality Using Division?](#)

You can use these search terms and phrases to help your student find additional help online:

- solving two-step inequalities
- solving inequalities with negative coefficients
- solving word problems that lead to two-step inequalities

LESSON 5-7

Solve Multi-Step Inequalities

Multi-step inequalities, like two-step inequalities, have more than one step and more than one operation.

LESSON OBJECTIVES

- Reinforce skills learned in previous lessons and apply that knowledge to solving multi-step inequalities.
- Explore the relationship between two-step inequalities and multi-step inequalities.
 - Apply the Distributive Property to simplify and solve multi-step equations.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Solve a Two-Step Inequality?](#)
- [How Do You Solve a Word Problem Using an Inequality With Variables on Both Sides?](#)

You can use these search terms and phrases to help your student find additional help online:

- solving multi-step inequalities
- solving inequalities with variables on both sides
- solving word problems that lead to multi-step inequalities