G8 Playlist: Solving Linear Equations

Aligns with *CCSS.MATH.CONTENT.8.EE.C.7: Solve linear equations in one variable.*

CCSS.MATH.CONTENT.8.EE.C.7.B: Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Related Standards

- *CCSS.MATH.CONTENT.7.EE.A.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.*
- *CCSS.MATH.CONTENT.8.EE.C.7.A: Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).*
- *CCSS.MATH.CONTENT.8.EE.C.8: Analyze and solve pairs of simultaneous linear equations.*
- *CCSS.MATH.CONTENT.HSA.REI.A.1: Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution.*
- *CCSS.MATH.CONTENT.HSA.REI.B.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*

Objectives

In this module, you will learn and practice the following skills:

- Apply the distributive property to simplify expressions.
- Solve linear equations in one variable.

Let's get started!

Key Terms

- A **linear equation** is an equation with solutions that form a straight line.
- A **solution** of a linear equation is a value for the variable that makes the equation true.
- The **distributive property** states that the product of a sum is equal to the sum of the products: $a(b + c) = ab + ac$.
- A **coefficient** is a quantity multiplied with a variable.
- When you **transform** an equation, you use properties of operations to rewrite the equation into the form you want.

Solving Linear Equations

(8.EE.C.7.A)

A **solution** of a **linear equation** in one **variable** is a value for the variable that makes the equation true. A linear equation in one variable can have no solution, one solution, or infinitely many solutions.

- If the equation can be transformed into $a = b$, where a and b are different real numbers, then the equation has no solution.
- If the equation can be transformed into $x = a$, then the equation has one solution, a.
- If the equation can be transformed into $x = x$, then the equation has infinitely many solutions.

If your students…

Do not understand solutions of an equation:

WATCH: Understand No-Solution Equations

https://www.opened.com/video/understand-no-solution-equations/412619

WATCH: Understand One-Solution Equations

https://www.opened.com/video/understand-one-solution-equations/412622

WATCH: Understand Infinite-Solution Equations

https://www.opened.com/video/understand-infinite-solution-equations/412621

Have difficulty determining the number of solutions of an equation:

WATCH: Determine the Number of Solutions an Equation has by Recognizing Patterns

https://www.opened.com/video/determine-the-number-of-solutions-an-equation-has-by-recognizing/412620

Determine the Number of Solutions an Equation has by Simplifying

https://www.opened.com/video/determine-the-number-of-solutions-an-equation-has-by-simplifying/412618

For extra practice recognizing equations with no solutions or infinitely many solutions:

PRACTICE: Identities and Equations With no Solutions

https://www.sophia.org/ccss-math-standard-8ee7a-pathway?standard=mathematics-grade-8