

Parent Newsletter

Chapter 1: Equations

Students will...

Solve simple equations using addition, subtraction, multiplication, or division.

Use inverse operations to solve multi-step equations.

Use the Distributive Property to solve multi-step equations.

Solve equations with variables on both sides.

Determine whether equations have no solution or infinitely many solutions.

Rewrite equations to solve for one variable in terms of the other variable(s).

Standards

Common Core:

8.EE.7a: 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).

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

Games

- Tic-Tac-Toe
- 5 is Alive
- 6 Sticks
- 7 Not 11
- 8 is Great
- 9 is Fine
- Can 3=2?
- More Fours

These are available online in the *Game Closet* at www.bigideasmath.com.

Key Ideas

Addition Property of Equality

- Adding the same number to each side of an equation produces an equivalent equation.
- If $a = b$, then $a + c = b + c$.

Subtraction Property of Equality

- Subtracting the same number from each side of an equation produces an equivalent equation.
- If $a = b$, then $a - c = b - c$.

Solving Multi-Step Equations

- To solve multi-step equations, use inverse operations to isolate the variable.

Multiplication Property of Equality

- Multiplying each side of an equation by the same number produces an equivalent equation.
- If $a = b$, then $a \cdot c = b \cdot c$.

Division Property of Equality

- Dividing each side of an equation by the same number produces an equivalent equation.
- If $a = b$, then $a \cdot c = b \cdot c$, $c \neq 0$.

Solving Equations with Variables on Both Sides

- To solve equations with variables on both sides, collect the variable terms on one side and the constant terms on the other side.

Temperature Conversion

A formula for converting from degrees Fahrenheit F to degrees Celsius C is

$$C = \frac{5}{9}(F - 32).$$



Reference Tools

A **Y Chart** can be used to compare two topics. List differences between the two topics in the branches of the Y and similarities in the base of the Y. A Y chart serves as a good tool for assessing knowledge of a pair of topics that have subtle but important differences.

Solving Simple Equations Using Addition

- Add the same number to each side of the equation.

Solving Simple Equations Using Subtraction

- Subtract the same number from each side of the equation.

- You can solve the equation in one step.
- You produce an equivalent equation.
- The variable can be on either side of the equation.
- It is always a good idea to check your solution.

Key Terms

An equation that has two or more variables is called a *literal equation*.

Essential Questions

How can you use inductive reasoning to discover rules in mathematics? How can you test a rule?

How can you solve a multi-step equation? How can you check the reasonableness of your solution?

How can you solve an equation that has variables on both sides?

How can you use a formula for one measurement to write a formula for a different measurement?

Quick Review

- Whatever you do to one side of the equation, you must do to the other side of the equation.
- Whenever a variable or constant term is moved from one side of the equal sign to the other, the opposite operation is used.
- Two equations that have the same solution are *equivalent equations*.
- Equations can have one solution, no solution or infinitely many solutions.
 - When solving an equation that has no solution, you will obtain an equivalent equation that is not true for any value of the variable.
 - When solving an equation that has infinitely many solutions, you will obtain an equivalent equation that is true for all values of the variable
- To rewrite a literal equation, solve for one variable in terms of the other variable(s).

What's the Point?

The ability to understand and use equations is very useful in real life for events like converting between different measurements. For example, many countries measure temperature in degrees Celsius instead of degrees Fahrenheit. Have your student research the temperature in degrees Celsius for a few countries they would like to visit. What are the temperatures in degrees Fahrenheit?

The STEM Videos available online show ways to use mathematics in real-life situations. The Chapter 1: Training for a Half-Marathon STEM Video is available online at www.bigideasmath.com.

