An equation is a statement of equality between two expressions. It is a statement that two quantities are equal. A solution to an equation is a value or set of values that make the equation true. The process of finding solutions to equations is called solving equations.

There are two main types of equations: linear and nonlinear. Linear equations are equations that can be written in the form $ax + b = 0$, where $a$ and $b$ are constants and $x$ is the variable. Nonlinear equations are equations that cannot be written in this form. Linear equations are often easier to solve than nonlinear equations.

Solving equations involves manipulating the equation to isolate the variable on one side and the constants on the other. This is done by applying inverse operations to both sides of the equation. Inverse operations are operations that undo each other, such as addition and subtraction, or multiplication and division.

For example, to solve the equation $2x + 3 = 7$, we would subtract 3 from both sides to get $2x = 4$, and then divide both sides by 2 to get $x = 2$.

Equations are used to model real-world situations. For example, if you are buying apples and oranges, and you know the price of each, you can use an equation to figure out the total cost of your purchase. If you are given the total cost and the price of one of the items, you can use an equation to find the price of the other item.

In this lesson, you will learn how to solve linear equations by applying inverse operations.

**Steps to Solve a Linear Equation**

1. Simplify both sides of the equation by combining like terms.
2. Move all terms containing the variable to one side of the equation and all constants to the other side.
3. Divide both sides of the equation by the coefficient of the variable to isolate the variable.

**Example**

Solve the equation $3x - 5 = 16$.

**Solution**

1. Simplify both sides of the equation. There are no like terms to combine.
2. Move all terms containing the variable to one side and all constants to the other side: $3x = 16 + 5$.
3. Divide both sides of the equation by the coefficient of the variable: $x = \frac{21}{3} = 7$.

**Check**

Substitute $x = 7$ into the original equation:

$3(7) - 5 = 16$

$21 - 5 = 16$

$16 = 16$

The solution is correct.

**Practice**

Solve the following equations:

1. $2x + 4 = 10$
2. $5 - 3x = 2$
3. $4x - 8 = 12$
4. $3(x - 2) = 9$

**Solutions**

1. $x = 3$
2. $x = 1$
3. $x = 5$
4. $x = 5$

**Summary**

In this lesson, you learned how to solve linear equations by applying inverse operations. You learned to simplify both sides of the equation, move all terms containing the variable to one side and all constants to the other side, and then divide both sides of the equation by the coefficient of the variable to isolate the variable. You practiced solving linear equations and checking your solutions.

Solving equations is an important skill that you will use in many areas of mathematics and in real-world situations. As you continue to learn mathematics, you will encounter more complex equations and learn more sophisticated techniques for solving them.