

Properties of Equality

- Addition Property of Equality

Adding the same number to both sides of an equation does not change the solution set to the equation. In symbols,

$$\text{if } a = b, \quad \text{then } a + c = b + c.$$

- Multiplication Property of Equality

Multiplying both sides of an equation by the same nonzero number does not change the solution set to the equation. In symbols,

$$\text{if } a = b \quad \text{and} \quad c \neq 0, \quad \text{then } ca = cb.$$

Strategy for Solving a Linear Equation

1. If fractions are present, multiply each side by the LCD to eliminate them.
If decimals are present, multiply both sides by a power of 10 to eliminate them.
2. Use the distributive property to remove parentheses.
3. Combine any like terms.
4. Use the addition property of equality to get all variables on one side and numbers on the other side.
5. Use the multiplicative property of equality to get a single variable on one side.
6. Check by replacing the variable in the original equation with your solution.