

2.1 The Addition Property of Equality

Definition 2.1.1 (Linear Equation)

any equation that can be written as $ax + b = c$ where $a \neq 0$

Linear:

- $2x - 5 = 3$
- $-3x = 18$
- $x = 4.5$

Non-Linear:

- $2x^2 + 3 = 7$
- $-\frac{1}{2x} = 4$
- $|x| = 6$

Definition 2.1.2 (Addition Property of Equality)

If $a = b$, then $a + c = b + c$.

Example 2.1.1

Solve for x :

$$x - 5 = 12$$

Example 2.1.2

Solve for x :

$$y + 2.8 = 5.09$$

Example 2.1.3

Solve for x:

$$-\frac{1}{2} = x - \frac{3}{4}$$

Note: These values we have solved for are called **solutions** or **roots** of the equation. They are values of the independent variable that make the statement true. *Linear equations* only have **at most one solution**. *Non-linear equations* may have **more than one solution**.

Before solving any equation, **always** simplify and combine like terms.

Example 2.1.4

Solve for y:

$$8y + 7 - 7y - 10 = 6 + 4$$

Example 2.1.5

Solve for x:

$$7x = 12 + 6x$$

Example 2.1.6

Solve for y:

$$3y - 9 = 2y + 6$$