



## Unit 1: Solving Equations and Inequalities

- *Equations with Variables on Both Sides*

You must perform the same exact operations on both sides of the equations. Get a constant on one side and a variable on the other side of the equation For example:

$$5x+7=4x-7$$

$$-7 \quad -7$$

$$5x=4x-14$$

$$-4x \quad -4x$$

$$x=-14$$

**Solved**

- *Ratios, Rates, and Conversions*

A ratio compares two numbers by division. The ratio of two numbers a and b, where  $b \neq 0$  can be written in three ways:

**a/b** or **a:b** or **a to b**

A ratio that compares quantities measured in different units is called a rate.

A rate with a denominator of 1 is a **unit rate**.

For example: Miles per hour is a unit rate. A vehicle travels x miles **per 1 hour**.

To convert from one unit to another, such as from feet to inches, you multiply the **original by a conversion factor that produces the desired unit.**

- 1 foot is equivalent to 12 inches (conversion factor). In order to convert 5 feet to inches, you multiply **5** (number of feet) by **12** (conversion factor/number of inches in a foot), resulting in **60 inches per 5 feet.**

- *Solving Proportions*

Example Problem  $\rightarrow \frac{x}{12} = \frac{4}{5}$

**Cross multiply the equation**, resulting in  $5x=48$

From here, solve like a regular equation. Divide 48 by 5 to get **x**, resulting in  $x=9.6$

## Resources

<https://www.ucscout.org/course/integratedmath-1>