

Literal Equations

A **Literal Equation** is an equation that contains more than one variable. Examples of literal equations are shown here:

$$\begin{aligned}2x + 3y &= 6 \\4w - 2x + z &= 0\end{aligned}$$

Formulas are used to express a relationship among physical quantities. A **formula** is a literal equation that states rules about measurements. Examples of formulas are shown here:

$$\frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{R} \quad (\text{Physics})$$

$$S = a_n + (n-1)d \quad (\text{Mathematics})$$

$$A = P + Prt \quad (\text{Business})$$

The addition and multiplication properties can be used to solve a literal equation for one of the variables. The goal is to rewrite the equation so that the variable being solved for is alone on one side of the equation and all the other numbers and variables are on the other side.

Solve: $A = P(1 + i)$ for i .

The goal is to rewrite the equation so that i is on one side of the equation and all other variables are on the other side.

$$A = P(1 + i)$$

$$A = P + Pi \quad \text{✗ Use the Distributive Property to remove parentheses}$$

$$A - P = P - P + Pi \quad \text{✗ Subtract P from each side of the equation}$$

$$A - P = Pi$$

$$\frac{A - P}{P} = \frac{Pi}{P} \quad \text{✗ Divide each side of the equation by P}$$

$$\frac{A - P}{P} = i$$

Example: Solve $3x - 4y = 12$ for y

$$3x - 4y = 12$$

$$3x - 3x - 4y = -3x + 12$$

$$-4y = -3x + 12$$

$$\frac{-4y}{-4} = \frac{-3x + 12}{-4}$$

$$y = \frac{3}{4}x - 3$$