

## Day 6 – Isolating a Variable: Simple Equations – Notes

Isolating a variable simply means to solve for that variable or get the variable "by itself" on one side of the equal sign (usually on the left). Sometimes we may have more than one variable in our equations; these type of equations are called **literal equations**. We solve literal equations the same way we solve "regular" equations.

### Steps for Isolating Variables

1. Locate the variable you are trying to isolate.
2. Follow the rules for solving equations to get that variable by itself.

Solving an Equation You're Familiar with	Solving a Literal Equation
$\frac{8x}{2} = \frac{10}{2}$ $x = 5$	$\frac{gh}{h} = \frac{m}{h} \quad \text{solve for } h$ $g = \frac{m}{h}$
$\frac{2x + 5}{-2} = \frac{11}{-5}$ $\frac{2x}{2} = \frac{6}{2}$ $x = 3$	$\frac{ax + b}{-b} = \frac{c}{-b} \quad \text{solve for } x$ $\frac{ax}{a} = \frac{c-b}{a}$ $x = \frac{c-b}{a}$

#### Practice:

Solve the equation for b:

$$\frac{a}{h} = \frac{bh}{h}$$

$$\boxed{\frac{a}{h} = b}$$

2. Solve the equation for b:  $y = mx + b$

$$\frac{y - mx}{-mx} = \frac{b}{-mx}$$

$$\boxed{y - mx = b}$$

3. Solve the equation for y:  $2x + 4y = 10$

$$\frac{2x + 4y}{-2x} = \frac{10}{-2x}$$

$$\frac{4y}{4} = \frac{-2x + 10}{4}$$

$$\boxed{y = -\frac{1}{2}x + \frac{5}{2}}$$

4. Solve the equation for m:

$$\frac{y - b}{-b} = \frac{mx}{-b}$$

$$\frac{y - b}{m} = \frac{mx}{m}$$

$$\boxed{x = \frac{y - b}{m}}$$

5. Solve the equation for w:  $p = 2l + 2w$

$$\frac{p - 2l}{2} = \frac{2w}{2}$$

$$\frac{p - 2l}{2} = \frac{2w}{2}$$

$$w = \frac{p - 2l}{2}$$

6. Solve the equation for a:  $\frac{a}{2} - 1 = b$

$$\frac{a}{2} - 1 = b$$

$$2 \cdot \frac{a}{2} = (b + 1) \cdot 2$$

$$a = 2(b + 1)$$

## Your Turn:

7. Solve the equation for y:  $6x - 3y = 15$

$$-3y = -6x + 15$$

$$\frac{-3y}{-3} = \frac{-6x + 15}{-3}$$

$$y = 2x - 5$$

8. Solve the equation for h:  $3V = \frac{1}{3}Bh$

$$3V = \frac{1}{3}Bh$$

$$\frac{3V}{B} = \frac{Bh}{B}$$

$$h = \frac{3V}{B}$$

9. Solve the equation for C:  $\frac{9}{5}C = \frac{5}{9}(F - 32)$

$$\frac{9}{5}C = \frac{5}{9}(F - 32)$$

$$\frac{9}{5}C = F - 32$$

$$\frac{9}{5}C + 32 = F$$

10. Solve the equation for h:  $A = \frac{bh}{2}$

$$A = \frac{bh}{2}$$

$$\frac{2A}{b} = \frac{bh}{b}$$

$$h = \frac{2A}{b}$$