

Solving Multi-Step Equations Guided Notes

A **Multi-Step Equation** is an equation that can be solved in more than two steps by combining like terms and distributive property.

There are two types of problems involving multi-step equations and are solved by:

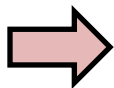
- **Combining Like Terms (CLT)**
- **Distributive property and CLT**

Solving Multi-Step Equations by Combining Like Terms

In solving these types of equations, we first combine the like terms i.e. the terms with the variable. After this, the equation is solved by applying the properties of equality.

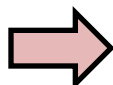
Problem 1: Solve $5x - 2x + 2 = 8$.

$$5x - 2x + 2 = 8$$



$$3x + 2 = 8$$

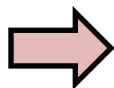
Combining Like Terms



$$3x + 2 - 2 = 8 - 2$$

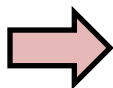
Subtraction Property of Equality

$$3x = 6$$



$$\frac{3x}{3} = \frac{6}{3}$$

Division Property of Equality

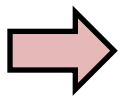


$$x = 2$$

Solving Multi-Step Equations Guided Notes

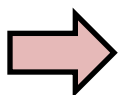
Problem 2: Solve $\frac{x}{4} + x + 11 = 6$.

$$\frac{x}{4} + x + 11 = 6$$



$$\frac{5x}{4} + 11 = 6$$

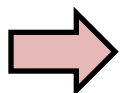
Combining Like Terms



$$\frac{5x}{4} + 11 - 11 = 6 - 11$$

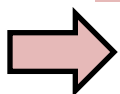
Subtraction Property of Equality

$$\frac{5x}{4} = -5$$



$$\frac{4}{5} \times \frac{5x}{4} = -5 \times \frac{4}{5}$$

Multiplication Property of Equality



$$x = -4$$

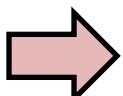
Solving Multi-Step Equations using Distributive property

In solving these types of equations, we first apply distributive property on the terms in parenthesis. After that we combine like terms and solve the equation for the variable.

$$A(B \pm C) = AB \pm AC$$

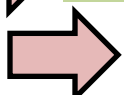
Distributive Property

Problem 3: Solve $3x + 5(x - 1) = 11$.



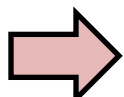
$$3x + 5x - 5 = 11$$

Distributive Property



$$8x - 5 = 11$$

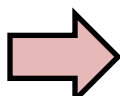
Combining Like Terms



$$8x - 5 + 5 = 11 + 5$$

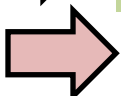
Addition Property of Equality

$$8x = 16$$



$$\frac{8x}{2} = \frac{16}{2}$$

Multiplication Property of Equality



$$x = 2$$