Solving Equations

The goal is to find the value of the variable!

Combine like terms wherever you can.

You need to get the variable on one side of the equal sign (=) and the constants on the other.

Solving Equations Using the Additive Inverse

Steps:

1. Add same amount to **both sides**. (It's better to keep the variable term on the side where it is already the largest variable value.)
2. Make zero (0) with the additive inverse.
3. Calculate the sum of the constants.
4. Check your answer by plugging it back into the **original equation** in place of the variable! *Use parentheses to help avoid errors with signs.*

Example 1:

$$x + 1 = 6$$
$$\underline{-1 \quad -1}$$
$$x + 0 = 5$$
$$x = 5$$

Does it check?
$$(5) + 1 = 6$$
$$6 = 6 \text{ yes!}$$

Example 2:

$$6m = 36 + 5m$$
$$\underline{-5m \qquad -5m}$$
$$m = 36 + 0$$
$$m = 36$$

Does it check?
$$6(36) = 36 + 5(36)$$
$$216 = 36 + 180$$
$$216 = 216 \text{ yes!}$$

Solving Equations Using the Multiplicative Inverse

Steps:

1. Add same amount to **both sides**. (It's better to keep the variable term on the side where it is already the largest variable value.)
2. Make zero (0) with the additive inverse.
3. Calculate the sum of the constants.
4. Multiply both sides by the multiplicative inverse (reciprocal) of the variable's coefficient.
5. Check your answer by plugging it back into the **original equation** in place of the variable! *Use parentheses to help avoid errors with signs.*

Example:

$$7m = 36 + 5m$$
$$\underline{-5m \qquad -5m}$$
$$2m = 36 + 0$$
$$2m = 36$$
$$\tfrac{1}{2} \cdot 2m = \tfrac{1}{2} \cdot 36$$
$$m = 18$$

Does it check?
$$7(18) = 36 + 5(18)$$
$$126 = 36 + 90$$
$$126 = 126 \quad \text{yes!}$$