

Solving Equations Using Inverse Operations

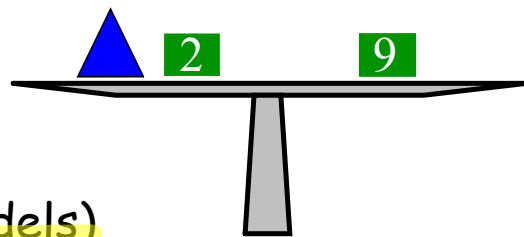
An **equation** is a math sentence with an equal sign.
It shows that two expressions are equal or the same value.

$n + 50 = 75$ means that $n + 50$ must have the same value as 75

$$L = R$$

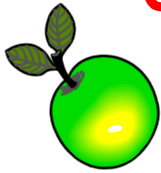
Strategies for solving equations:

- **Guess and check**
- **Draw a picture**
- **Work backwards (Box Models)**



Be sure to check your answer by substituting it back into the original equation.

Solving Equations Using Inverse Operations



Golden Rules of Algebra

1.) Whatever you do to one side, you must do to the other

2.) Isolate the variable (get the variable by itself)

3.) Use inverse (opposite) operations to solve

Work backwards through Order of Operations

→ PEMDAS ←

Inverse Operations

Inverse Operations - operations that undo each other (opposite operations)

What is the opposite of addition? subtraction

Example: $x + 8 - 8$

What is the opposite of multiplication? division

Example: $x \cdot 2 \div 2$

What is the opposite of squared? $\sqrt{\quad}$ square root

Example:

When we solve equations using inverse operations, we work backwards through the order of operations (PEMDAS)

Example

Solve by using Inverse Operations.

Check by substituting your value for x back into the original equation.

Remember to **SHOW ALL WORK** step by step!

$$5 \cdot x \\ 5x = 10$$

$$\frac{5x}{5} = \frac{10}{5} \\ x = 2$$

$$x + 5 = 12$$

$$x + 5 - 5 = 12 - 5$$

$$x = 7$$

Example

Solve. Check by substituting your value for x back into the original equation.

Remember to SHOW ALL WORK step by step!

$$3x = 15$$

$$5x = 50$$

H/W

Example

Solve. Check by substituting your value for x back into the original equation.
Remember to **SHOW ALL WORK** step by step!

$$x - 3 = 12$$

$$x - 3 + 3 = 12 + 3$$

$$x = 15$$

$$5 \times 2$$

$$\frac{x}{4} = 7$$

$$\frac{x}{4} \cdot 4 = 7 \cdot 4$$

$$x = 28$$

Example

Solve. Check by substituting your value for x back into the original equation.

Remember to **SHOW ALL WORK** step by step!

$$2x + 1 = 5$$

$$2x + 1 - 1 = 5 - 1$$

$$2x = 4$$

$$\frac{2x}{2} = \frac{4}{2}$$

$$x = 2$$

Example

Solve. Check by substituting your value for x back into the original equation.

Remember to SHOW ALL WORK step by step!

$$2x - 4 = 8$$

H/W

Example

Solve. Check by substituting your value for x back into the original equation.

Remember to SHOW ALL WORK step by step!

H/w

$$\frac{x}{3} + 2 = 7$$