Chapter 36

SOLVING FOR VARIABLES

Often, we are not given a number to substitute for the variable. This is when we must "solve for the unknown," or "solve for x."

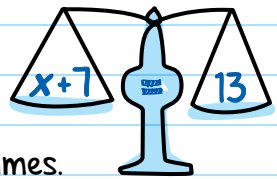
> Solving an equation is like asking, "Which value makes this equation true?"

In order to do so, we must **ISOLATE THE VARIABLE** on one side of the equal sign.

EXAMPLE: $x + 7 = 13$

In order to isolate the variable (x) on one side of the equal sign, we must:

1. Think of an equation as a scale, with the = sign as the middle. You *must* keep the scale balanced at all times.



2. Ask yourself, "What is happening to this variable?"
In this case, 7 is being added to the variable.

3. So, how do we get the variable alone? We use **INVERSE OPERATIONS** on both sides of the equation.
What is the inverse of adding 7? Subtracting 7.

WHEN YOU SEE THE WORD **INVERSE**, THINK ABOUT OPPOSITES!

$x + 7 = 13$
$x + 7 - 7 = 13 - 7$ (We subtract 7 from both sides to keep the equation balanced.)
$x = 6$

CHECK YOUR WORK

$x + 7 = 13$
$6 + 7 = 13$
$13 = 13$ ✓

Check your work by plugging your answer into the original equation.

Inverse is just another word for *opposite*. Here's a quick rundown of all the operations and their inverse operations:

OPERATION	INVERSE
Addition	Subtraction
Subtraction	Addition
Multiplication	Division
Division	Multiplication
Squaring (exponent of 2)	Square root ($\sqrt{}$)
Cubing (exponent of 3)	Cube root $\sqrt[3]{}$