

# 6.1 - Solving by Inverse Operations

March 6, 2020 8:34 AM

**Math 9**

Name: \_\_\_\_\_ Block: \_\_\_\_\_

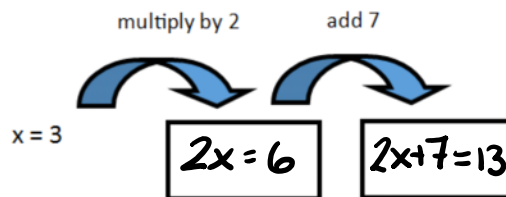
## Chapter 6: Linear Equations & Inequalities

Topic	Assignment	Completed?
6.1: Solving Equations by Using Inverse Operations	Pg. 271 # 5-10, 14, 17, 22	
6.2: Solving Equations by Using Balance Strategies	Pg. 281 # 7 – 13, 19*, 22*	
6.3: Introduction to Linear Inequalities	Pg. 292 # 3 - 11	
6.4: Solving Linear Inequalities by Using Addition & Subtraction	Pg. 298 # 4 – 9, 12, 14, 15*	
6.5: Solving Linear Inequalities by Using Multiplication & Division	Pg. 305 # 4, 5a, 7 – 12, 17*	

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### 6.1 Solving Equations by Using Inverse Operations

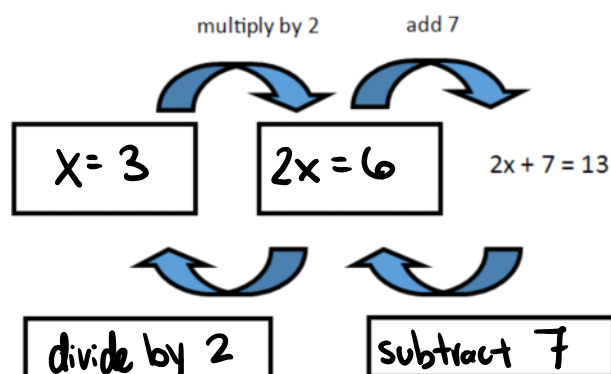
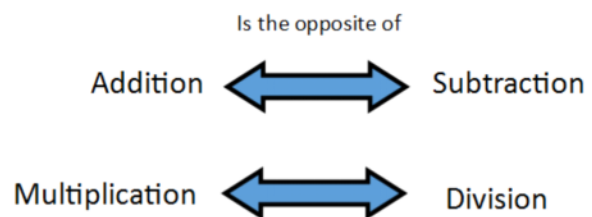
Let's start with an equation with a variable,  $x = 3$ . Then, we can perform any number of operations (to both sides, as always) to build on our original equation:



Now this is a kind of equation that we could be asked to solve. Essentially, we follow the same steps backwards to arrive at what our variable equals ( $x = 3$ ), but we need to use the **opposite** of our original operations:



Remember:



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### Example 1: Solving a 1-step Equation:

Determine the value of x in:  $x + 2.4 = 6.5$

What operation was applied to x to build this equation?

Addition of 2.4

So what is the inverse operation?

Subtraction.

Apply the opposite operation to **both sides** to isolate for x:

$$\begin{array}{r} x + 2.4 = 6.5 \\ -2.4 \quad -2.4 \\ \hline \end{array}$$

$$x = 6.5 - 2.4 = 4.1$$

### Example 2: Solving a 1-step Equation:

Three times a number is -3.6. Determine that number.

↳ "x"

First, create an equation representing the sentence:

$$\begin{array}{l} 3 \times x = -3.6 \\ 3x = -3.6 \end{array}$$

What operation was applied to x to build this equation?

Multiplication

So what is the inverse operation?

Division.

Apply the opposite operation to **both sides** to isolate for x:

$$\begin{array}{r} 3x = -3.6 \\ \frac{3}{3} \quad \frac{3}{3} \\ \hline x = -3.6/3 = -1.2 \end{array}$$

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### Example 3: Solving a 2-step Equation:

Determine the value of  $d$  in:  $4.5d - 3.2 = -18.5$

What operations were applied to  $d$  to build this equation?

Multiplication and  
Subtraction.

So what are the inverse operations?

division and  
addition.

Apply the opposite operations to **both sides** to isolate for  $d$ :

$$\begin{aligned} 4.5d - 3.2 &= -18.5 \\ + 3.2 & \quad + 3.2 \\ \hline 4.5d &= -15.3 \\ \hline \frac{4.5d}{4.5} &= \frac{-15.3}{4.5} \\ d &= \frac{-15.3}{4.5} = -3.4 \end{aligned}$$

We can now check our answer by substituting what we've calculated in to our original equation:

$$\begin{aligned} 4.5d - 3.2 &= -18.5 \\ 4.5(-3.4) - 3.2 &= -18.5 \\ -15.3 - 3.2 &= -18.5 \\ -18.5 &= -18.5 \\ LS &= RS \quad \checkmark \end{aligned}$$



Textbook Assignment: Pg. 271 # 5-10, 14, 17, 22

calculate  
BEDMAS  
solve